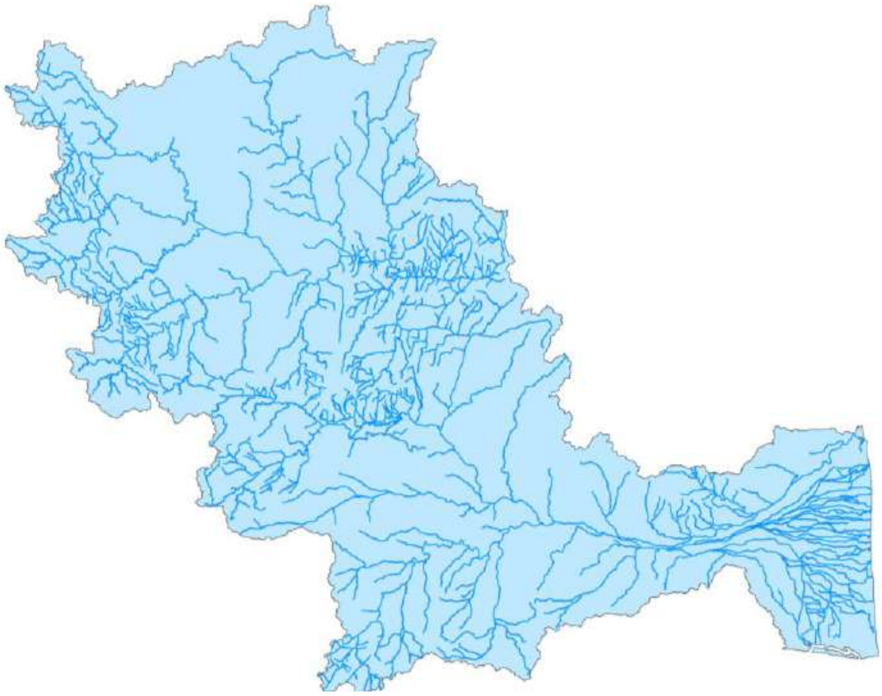
National River Conservation Directorate
Ministry of Jal Shakti,
Department of Water Resources,
River Development & Ganga Rejuvenation
Government of India

WATER DEMAND & SUPPLY

for

Cauvery River Basin (CRB)



June 2025

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Cauvery River Basin (CRB)

National River Conservation Directorate (NRCD)

The National River Conservation Directorate, functioning under the Department of Water Resources, River Development and Ganga Rejuvenation, and Ministry of Jal Shakti providing financial assistance to the State Government for conservation of rivers under the Centrally Sponsored Schemes of 'National River Conservation Plan (NRCP).' National River Conservation Plan to the State Governments/ local bodies to set up infrastructure for pollution abatement of rivers in identified polluted river stretches based on proposals received from the State Governments/ local bodies.

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www.ccauvery.org

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www.cganga.org

Acknowledgment

This report is a comprehensive outcome of the project jointly executed by IISc Bengaluru (Lead Institute) and NIT Tiruchirappalli (Fellow Institute) under the supervision of cGanga at IIT Kanpur. It was submitted to the National River Conservation Directorate (NRCD) in 2024. We gratefully acknowledge the individuals who provided information and photographs for this report.

Suggested Citation

cCauvery and cGanga (2024), Water supply and demand for Cauvery River basin, NRCD, DoWR, RD & GR, Ministry of Jal Shakti, Government of India

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PREFACE

In an era of unprecedented environmental change, understanding our rivers and their ecosystems has never been more critical. This report aims to provide a comprehensive overview of our rivers, highlighting their importance, current health, and the challenges they face. As we explore the various facets of river systems, we aim to equip readers with the knowledge necessary to appreciate and protect these vital waterways.

Throughout the following pages, you will find an in-depth analysis of the principles and practices that support healthy river ecosystems. Our team of experts has meticulously compiled data, case studies, and testimonials to illustrate the significant impact of rivers on both natural environments and human communities. By sharing these insights, we hope to inspire and empower our readers to engage in river conservation efforts.

This report is not merely a collection of statistics and theories; it is a call to action. We urge all stakeholders to recognize the value of our rivers and to take proactive steps to ensure their preservation. Whether you are an environmental professional, a policy maker, or simply someone who cares about our planet, this guide is designed to support you in your efforts to protect our rivers.

We extend our heartfelt gratitude to the numerous contributors who have generously shared their stories and expertise. Their invaluable input has enriched this report, making it a beacon of knowledge and a practical resource for all who read it. We hope that this report will catalyse positive environmental action, fostering a culture of stewardship that benefits both current and future generations.

As you delve into this overview of our rivers, we invite you to embrace the opportunities and challenges that lie ahead. Together, we can ensure that our rivers continue to thrive and sustain life for generations to come.

Centres for Cauvery River Basin
Management Studies (cCauvery)
IISc Bengaluru (Lead Institute), NIT Tiruchirappalli (Fellow Institute)

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Abbreviations

AHS	:	Animal Husbandry Statistics
ASI	:	Annual Survey of Industries
BBMP	:	Bruhat Bengaluru Mahanagara Palike
BCM	:	Billion Cubic Metres
BWSSB	:	Bengaluru Water Supply and Sewerage Board
CGWB	:	Central Ground Water Board
CPCB	:	Central Pollution Control Board
CRB	:	Cauvery River Basin
CWSS	:	Cauvery Water Supply Scheme
DES	:	Directorate of Economics and Statistics
DIP	:	District Irrigation Plan
FHTC	:	Functional Household Tap Connection
GDR	:	Groundwater Dependency Ratio
GIS	:	Geographic Information System
GW	:	Groundwater
ICRISAT	:	International Crops Research Institute for the Semi-Arid Tropics
II	:	Irrigation Intensity
IMD	:	Indian Metrological Department
JJM	:	Jal Jeevan Mission
KSRSAC	:	Karnataka State Remote Sensing Applications Centre
KUWSDB	:	Karnataka Urban Water Supply and Drainage Board
LPCD	:	Litres Per Capita per Day
LULC	:	Land Use Land Cover
MCM	:	Million Cubic Metres
ML	:	Million Litres
MLD	:	Million Litres per Day
MVS	:	Multi Village Scheme
NCA	:	National Commission on Agriculture
NITI	:	National Institution for Transforming India
OGD	:	Open Government Data
OHT	:	Overhead Tank
PIB	:	Press Information Bureau
PMKSY	:	Pradhan Mantri Krishi Sinchayee Yojana
PRI	:	Proportion under Repeated Irrigation
STP	:	Sewage Treatment Plant
SVS	:	Single Village Scheme
SW	:	Surface Water
TMC	:	Thousand Million Cubic Feet
TNAU	:	Tamil Nadu Agricultural University

1. INTRODUCTION

Freshwater scarcity is among the defining resource challenges of the twenty-first century. Approximately 70% of freshwater withdrawals worldwide come from agriculture, followed by industry at 20% and domestic usage at nearly 12% (UNESCO/UN-Water, 2024). Approximately 25% of all irrigation water and half of all freshwaters extracted for home use come from groundwater alone. In 2022, around 50% of the world's population had severe water scarcity for at least a portion of the year, and 25% had extremely high-water stress (UN SDG Report, 2024). Despite improvements since 2015, one in four people worldwide roughly 2.1 billion people still do not have access to adequately regulated drinking water, with 106 million of them depending on untreated surface sources (WHO/UNICEF, 2025). The availability of renewable water per person has decreased by 7% during the previous ten years, according to the FAO's 2025 AQUASTAT statistics, while strain on freshwater resources has increased in a number of areas. (FAO, 2025). Water resource assessments at the national and basin level must be positioned within the larger structure established by these global trends.

A significant example of this global challenge is India, which provides for over 18% of the world's population while being granted access to only 4% of freshwater resources overall. The Central Water Commission's reassessment study states that, the average annual per capita water availability was assessed at 1,486 cubic metres for 2021 and is projected to decline further to 1,367 cubic metres by 2031 (CWC, 2019;Press Information Bureau, 2022), both figures falling below the internationally recognised water stress threshold of 1,700 cubic metres per capita per year (Press Information Bureau, 2022). As reported by CWC, Water and Allied Statistics, per capita annual availability dropped from 1,816 cubic meters in 2001 to 1,545 cubic meters in 2011. The decline reflects the compounding effects of urbanisation; population increase and expanding sectoral demand. India is experiencing its worst water crisis in history, as reported by the NITI Aayog's Composite Water Management Index (CWMI), that was published in 2018 in partnership with the Ministries of Water Resources, Drinking Water and Sanitation, and Rural Development. The identical examination estimated that by 2030, the country's water demand will be double its current supply, resulting in acute water shortages for hundreds of millions of people and a six percent loss in GDP by 2030. The entire water resource potential is only 1,122 BCM, consisting of 690 BCM of surface water and 432 BCM of refillable groundwater. According to the Ministry of Water Resources, the total water demand was predicted to be 813 BCM in 2010, increasing to 1,093 BCM by 2025 and 1,447 BCM by 2050 (CWC/MoWR). These national-level pressures are unevenly distributed across river basins, with monsoon-dependent peninsular basins subject to inter-state allocation disputes facing particularly acute stress.

The Cauvery River Basin (CRB), one of southern India's most significant inter-state river systems, exemplifies these converging pressures at the regional scale. Originating in the Brahmagiri hills of the Western Ghats in Karnataka, the Cauvery flows south-eastward for approximately 800 km before draining into the Bay of Bengal in Tamil Nadu, covering a geographically and hydrologically diverse landscape across Karnataka, Tamil Nadu, Kerala, and the Union Territory of Puducherry. The basin encompasses forested highlands, semi-arid plateaus, irrigated agricultural plains, and densely populated deltaic regions, and supports major urban centres such as Bengaluru, Mysuru, Coimbatore, Tiruchirappalli, and Thanjavur alongside thousands of rural settlements. Hydrologically, the basin is predominantly monsoon-dependent, receiving rainfall from both the southwest and northeast monsoons, with significant spatial and seasonal variability influencing river discharge, reservoir storage, and groundwater recharge. Water distribution is regulated by a network of major reservoirs and barrages including Krishna Raja Sagara (KRS), Mettur Dam (Stanley Reservoir), Kabini, Hemavathi, Harangi, and the Grand Anicut (Kallanai) which collectively support irrigation, hydropower generation, drinking water supply, and industrial use. Downstream deltaic regions, particularly in Tamil Nadu and Karaikal, are sustained by an intricate system of distributaries such as the Kodamurutti, Arasalar, Veeracholanar, and Vikramanar. Water shortages in the basin are attributed to population growth, rapid urbanisation and industrialisation, environmental degradation, and inefficient water use, all aggravated by changing climate and its impacts on demand, supply, and water quality (Vanham et al., 2011). Studies on the basin's crystalline-rock aquifers have demonstrated that under high abstraction and variable seasonal recharge, groundwater constitutes a highly variable resource, with sustained pumping reducing baseflow to rivers and creating downstream implications (Bianchi et al., 2020). The unsustainable abstraction of groundwater and marked changes in climate due to natural and anthropogenic processes have imposed immense pressure on freshwater sources across the basin (Arulbalaji et al., 2019). Figure 1 illustrates the spatial extent, drainage network, and administrative boundaries of the study area within the CRB, providing the geographical context for the analysis.

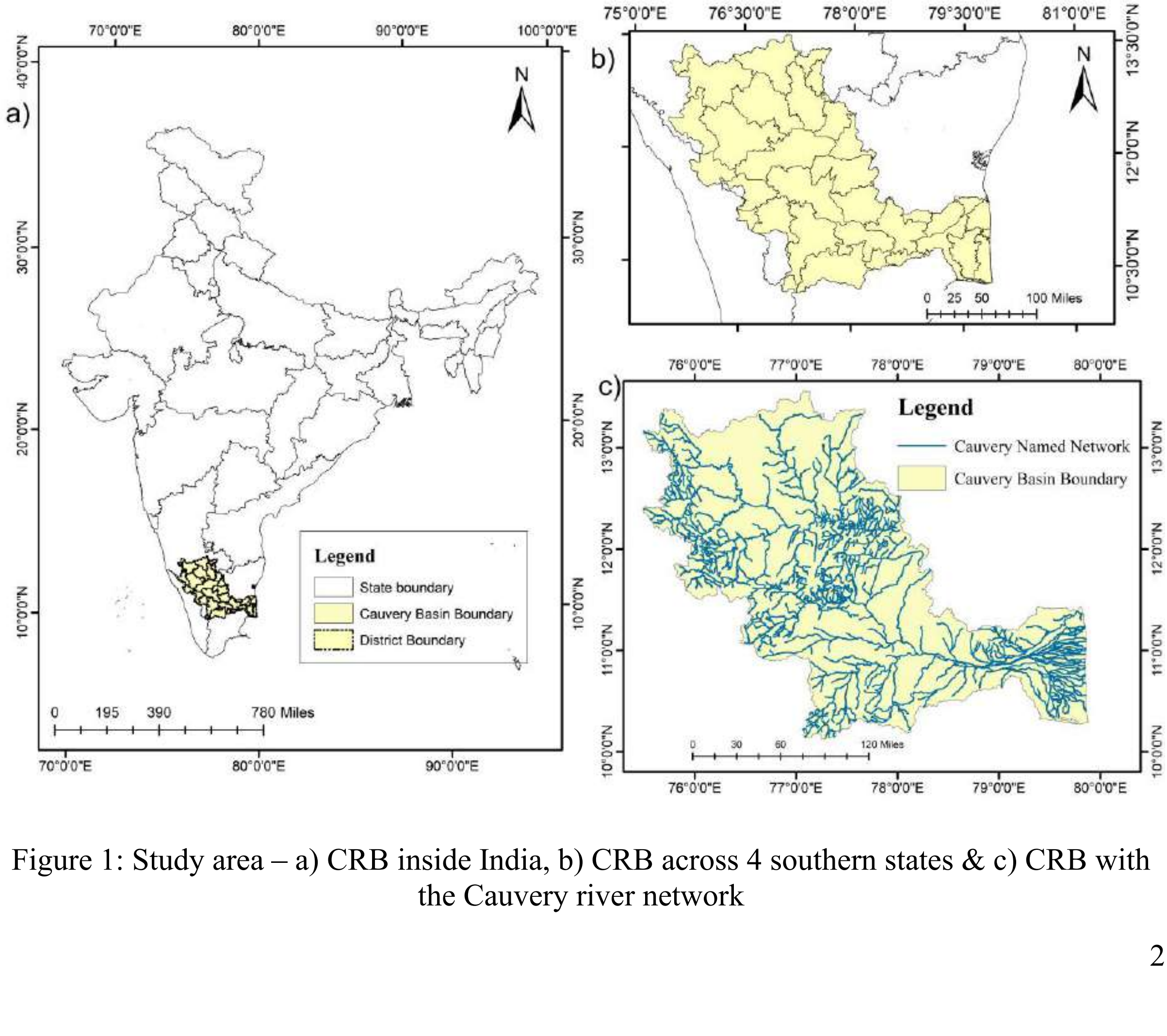

Figure 1: Study area – a) CRB inside India, b) CRB across 4 southern states & c) CRB with the Cauvery river network

Population growth, expansion of Functional Household Tap Connections (FHTC) under national programmes such as the Jal Jeevan Mission, changing consumption patterns, and climate variability are intensifying pressure on both surface and groundwater resources within the basin. To systematically evaluate these pressures, it is essential to examine sector-wise water demand and available supply sources. Accurate estimation of water requirements forms the foundation for planning sustainable water supply systems, infrastructure augmentation, and inter-sectoral allocation strategies. Water demand within the CRB can be broadly categorised into domestic, agricultural, industrial, commercial, environmental, and institutional uses.

Within the CRB, water demand spans five broad categories. Domestic needs drinking, cooking, cleaning, and washing form the baseline requirement for the basin's 66.11 million residents as of 2011 census. Agricultural demand, centred on paddy irrigation in the Tamil Nadu delta and plantation crops in Karnataka, accounts for the largest volumetric share. Industrial demand arises from manufacturing, processing, cooling, and energy production across districts like Tiruchirappalli, Erode, and Coimbatore. Commercial and environmental demands, while smaller in volume, are increasingly recognised in basin planning frameworks. Also to note that the district of Mayiladuthurai is carved at the period of 2020 from the Nagapattinam district by which it shares major data before separation with the above said district for recent studies. Accurate supply and demand assessment across these sectors is especially critical for the Cauvery, where population growth, rapid urbanisation in Bengaluru and western Tamil Nadu cities, and the terms of the Cauvery Water Disputes Tribunal Award simultaneously shape allocation decisions. Long-term water security in the basin therefore depends not just on supply augmentation but on demand efficiency, reduced distribution losses, and infrastructure that can accommodate shifting sectoral pressures.

2. DOMESTIC WATER REQUIREMENT

The Cauvery River Basin supports a substantial population across both rural and urban regions. As per Census 2011, the basin districts comprise approximately 9.23 million rural households and 7.51 million urban households, with corresponding populations of 36.75 million and 29.36 million, respectively.

Population distribution significantly influences domestic water demand. Urban areas, characterized by higher service levels and per capita consumption, contribute more substantially to demand growth than rural regions. Consequently, districts undergoing rapid urbanization are expected to witness a greater increase in future water demand. The decadal population growth (2001–2011) is presented in Table 1.

Table 1: Population Decadal growth (%) between the year 2001 & 2011

S. No	District	Population in 2011	Decadal Growth (%)
1	Ariyalur	754894	8.54
2	Coimbatore	3458045	18.56
3	Cuddalore	2605914	14.02
4	Dharmapuri	1506843	16.34
5	Dindigul	2159775	12.31
6	Erode	2251744	11.66
7	Karur	1064493	13.77
8	Krishnagiri	1879809	20.41
9	Nagapattinam	1616450	8.57
10	Namakkal	1726601	15.61
11	Perambalur	565223	14.50
12	Pudukkottai	1618345	10.88
13	Salem	3482056	15.44
14	Thanjavur	2405890	8.56
15	Nilgiris	735394	-3.51
16	Thiruvarur	1264277	8.11
17	Tiruchirappalli	2722290	12.57
18	Tiruppur	2479052	29.10
19	Karaikal	200222	17.23
20	Bengaluru Rural	990923	16.45
21	Bengaluru Urban	9416277	47.18
22	Chamarajanagar	1020791	5.73
23	Chikkaballapura	1255104	9.23
24	Chikmagalur	1137961	12.31
25	Hassan	1776421	3.18
26	Kodagu	554519	1.09
27	Mandya	1805769	2.38
28	Mysuru	3001127	13.63
29	Ramanagara	1082636	5.05
30	Tumakuru	2678980	3.65
31	Idukki	1108974	-1.79
32	Palakkad	2809934	7.35
33	Wayanad	817420	4.71

As shown in Table 1, population growth varies considerably across districts. Moderate growth (8–18%) is observed in several regions, while Bengaluru Urban (47.18%) records the highest increase, reflecting rapid metropolitan expansion. Other districts such as Tiruppur (29.10%), Krishnagiri (20.41%), and Coimbatore (18.56%) also indicate significant growth linked to urban and industrial development.

In contrast, Nilgiris (-3.51%) and Idukki (-1.79%) exhibit marginal population decline, likely due to migration and geographical constraints. Overall, the trends in Table 1 indicate that urban and industrial districts are expanding faster than predominantly rural areas, with direct implications for increasing domestic water demand within the basin. Note: Mayiladuthurai district is carved out during 2020 from Nagapattinam district.

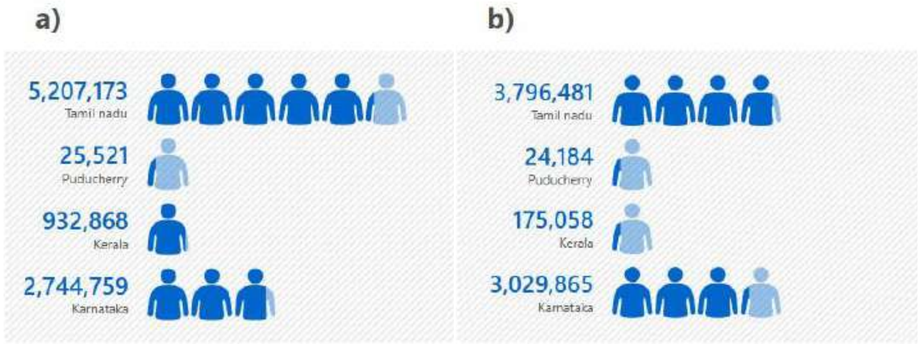

Figure 2: Total no. of Households in (a)Rural and (b)Urban region

Figure 2 illustrates the distribution of rural and urban households across the CRB states. Rural households constitute a dominant share, particularly in Tamil Nadu and Karnataka, reflecting the prevalence of agriculture-dependent settlements. At the same time, a notable concentration of urban households is observed in major metropolitan and industrial districts.

Urban centres such as Bengaluru, Coimbatore, Salem, and Tiruchirappalli significantly influence the basin's urban household distribution. Correspondingly, Bengaluru Urban records the highest urban domestic water demand (444.53 MCM in 2011), accounting for nearly 30% of the total urban demand. Other major contributors include Coimbatore (133.83 MCM), Salem (90.66 MCM), Tiruppur (77.73 MCM), and Tiruchirappalli (68.37 MCM). In contrast, districts such as Wayanad (1.61 MCM), Idukki (2.66 MCM), Karaikal (5.01 MCM), and Perambalur (4.97 MCM) contribute only marginally.

This pattern highlights the basin's dual demographic structure, where extensive rural settlements coexist with rapidly expanding urban centres, both contributing to overall domestic water demand.

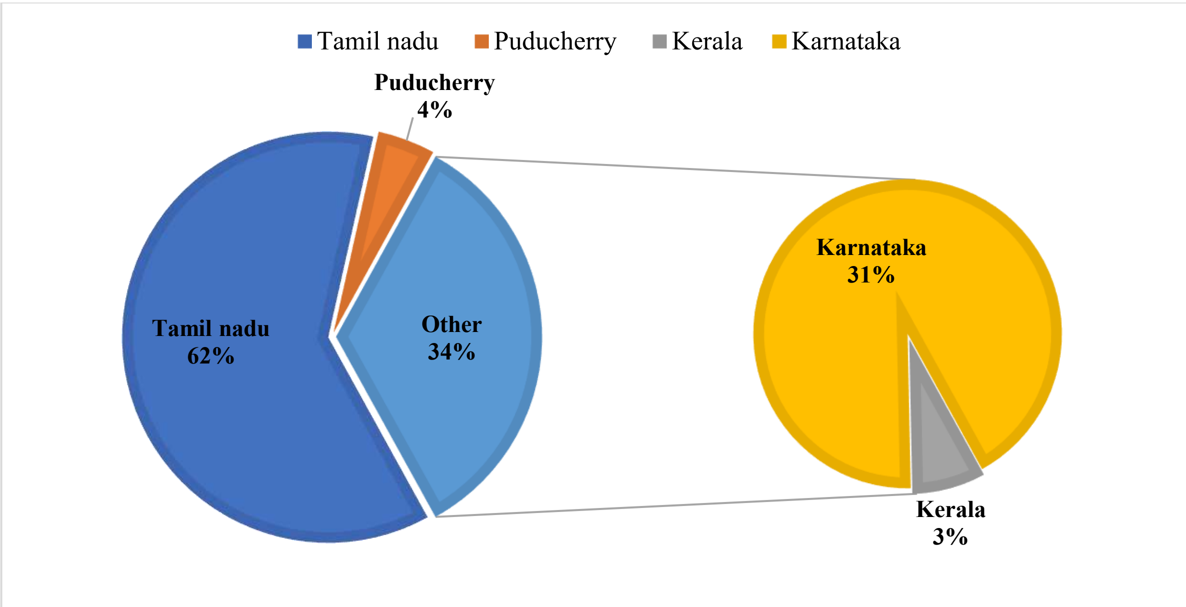

Figure 3: State-wise Population Distribution within the CRB (Census 2011)

Figure 3 presents the proportional distribution of population across basin states (Census 2011). Tamil Nadu accounts for the largest share, followed by Karnataka, while Kerala and the Union Territory of Puducherry contribute comparatively smaller proportions. This reflects the larger spatial extent of the basin within Tamil Nadu and Karnataka, where multiple districts fall fully or partially within the basin boundary, resulting in higher aggregate water demand.

Future projections indicate that districts with higher urban growth will drive a greater share of incremental water demand compared to predominantly rural regions. This trend signifies an increasing dominance of municipal and industrial requirements alongside agricultural demand, emphasizing the need for water resource planning frameworks to address both the rising volume and the shifting spatial distribution of demand.

In summary, the demographic transformation within the CRB characterized by stable rural growth and accelerated urban expansion intensifies pressure on available water resources. Sustainable basin management strategies must therefore integrate population-driven demand projections with sectoral allocation planning to ensure long-term water security under rapidly evolving demographic conditions.

2.1 Domestic water requirement norms

Domestic water demand refers to the quantity of water required to meet essential daily needs, including drinking, cooking, bathing, washing, cleaning, and sanitation. Its estimation is a fundamental component of water supply planning, as it is directly influenced by population size, settlement characteristics, and the level of service provision.

According to BIS Code IS 1172:1993 (Reaffirmed 2022), per capita domestic water requirements range from 55 to 135 litres per capita per day (LPCD), depending on the type of settlement and availability of infrastructure. Accordingly, domestic water demand assessments consider the nature of habitation (rural or urban) and the corresponding water supply systems, in line with BIS guidelines.

2.1.1 Rural Areas

For rural habitations (with population up to 20,000), the adopted norm is 55 LPCD, which broadly accounts for:

- 3 LPCD – Drinking
- 5 LPCD – Cooking
- 15 LPCD – Bathing
- 7 LPCD – Washing utensils and house
- 10 LPCD – Ablution and other uses
- 15 LPCD – Livestock, flushing, and miscellaneous requirements

For planning purposes, one hand pump or standpost is typically considered to serve approximately 250 persons.

2.1.2 Urban Areas

For urban habitations, higher service levels are prescribed. The Public Health Engineering Department (PHED) provides a minimum of 70 LPCD in towns with basic piped supply. However, as per CPHEEO (Central Public Health and Environmental Engineering Organisation) guidelines, the recommended norms are:

- 70 LPCD-Towns with piped supply and no sewerage system
- 135 LPCD – Cities with piped supply and existing or proposed sewerage system (an additional 5 LPCD will be added for the account for minor distribution losses)
- 150 LPCD – Metropolitan and megacities with full sewerage coverage

These norms include domestic, commercial, institutional, and minor industrial requirements. An additional allowance of approximately 15% is often considered to account for unaccounted-for water (UFW). The standard per capita water demand norms adopted for different categories of urban settlements are summarized in Table 2.

Table 2: Domestic Water Requirement per capita per day

S. no.	Activity	Water consumption (Liter per day per head)
1	Drinking	5
2	Cooking	5
3	Bathing	55
4	Cloth Washing	20
5	Utensil Washing	10
6	House Washing	10
7	Flushing	30
	TOTAL	135

2.1.3 Population Projection and Demand Estimation

Based on the above service level norms, domestic water demand has been estimated for both the base year population (Census 2011) and the projected population for future years. Population projections were conducted for the planning horizon using the geometric growth method, which assumes a continuous compounding growth pattern over time. This approach is consistent with standard Indian demographic projection practices for census-based water supply planning. The projected population for future years was calculated using the following relationship:

$$P_t = P_0(1 + r)^t \text{---------------------} (1)$$

Where:

- P_t = Population after t years
- P_0 = Base year population
- r = Annual growth rate
- t = Time period in years

The growth rates here adopted are district specific (CAGR) derived from the census 2001 and Census 2011 decadal population difference data, which have been applied for all projection calculations. The CAGR for each district has been applied uniformly to both the rural and urban population components within that district. Although Census 2011 provides separate rural and urban population figures for 2001 and 2011, direct computation of disaggregated growth rates is problematic for forward projection. Between the two census periods, a substantial number of settlements across the basin were reclassified from rural to urban (census towns), particularly in districts such as Bengaluru Urban, Coimbatore, and Tiruppur. This reclassification inflates apparent urban growth and deflates rural growth through administrative boundary changes rather than actual demographic shift. Applying such rates over a 14-year projection horizon would overstate urban populations. A uniform district-level CAGR avoids this distortion, though actual rural-urban shares in 2025 may differ from projected values due to continued urbanisation and migration. This method shows the significant inter district demographic variation evident in Table 1, where the decadal growth ranges from -3.51% to 47.18%

Using the projected population values, the domestic water demand has been calculated by multiplying the projected population with the applicable LPCD norm and converting the total requirement into Million Cubic Meters (MCM).

2.2 Domestic water demand

Domestic water demand has been estimated using district-wise projected population and per capita consumption norms (LPCD) as prescribed by CPHEEO. The daily demand values are converted into annual volumetric requirements, expressed in MCM, to enable consistent comparison at both district and basin scales.

Within the CRB, rural domestic water demand represents a substantial share of the total water requirement. Due to variations in settlement patterns, population distribution, and growth trends, a district-level assessment is necessary for accurate estimation. Accordingly, the present analysis evaluates rural population distribution, demographic growth, and projected domestic demand for 2025, based on census data and population projections. This approach supports the assessment of future demand trends and provides a basis for planning sustainable rural water supply systems within the basin.

2.2.1 Rural Domestic Water Demand

The rural region of the CRB constitutes of 20,330 inhabited villages and 1478 uninhabited villages, which has around 36.75 million people. The detailed district-wise rural population and corresponding domestic water demand presented in Table 3 & the spatial distribution of rural demand for the base and projected years is illustrated in Figure 5 and Figure 6.

By using a CPHEEO water supply norm for rural - 55 LPCD, the total rural domestic water demand for 2011 is estimated at 738 MCM. As shown in Table 3, demand varies significantly across districts, primarily due to differences in population and settlement distribution. Palakkad (42.82 MCM), Tumakuru (41.75 MCM), Mysuru (35.25 MCM), Cuddalore (34.54 MCM), and Salem (34.29 MCM) represent the major contributors, while districts such as Karaikal (2.05 MCM), Ramanagara (3.10 MCM), and Nilgiris (6.02 MCM) exhibit comparatively low demand. Below Figure 4 shows the state-wise distribution of rural domestic demand for 2011 and 2025, indicating that Tamil Nadu contributes the largest share, followed by Karnataka and Kerala, with Puducherry (Karaikal) contributing minimally. Overall, the increasing trend across states reflects gradual demographic growth rather than rapid expansion.

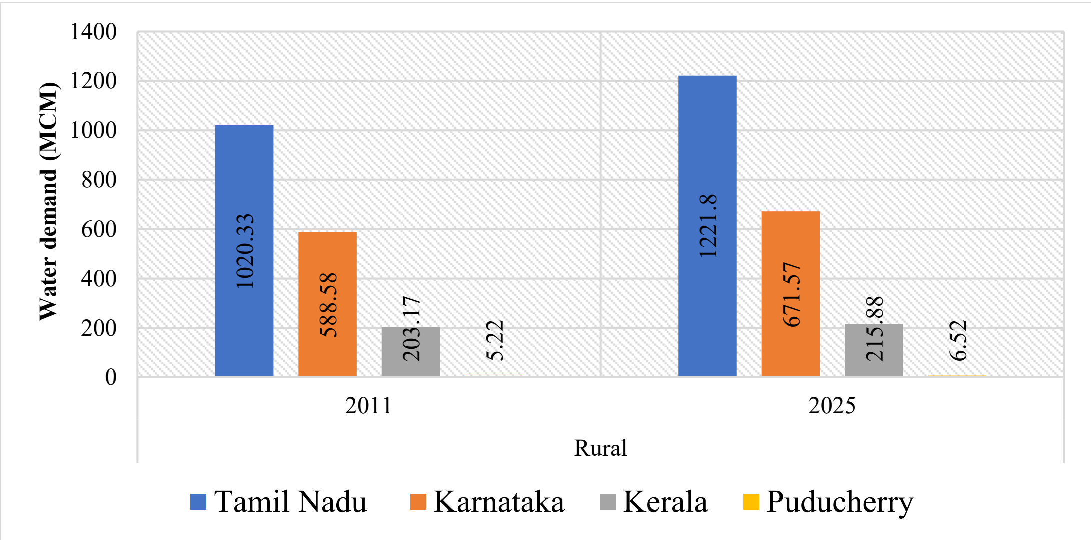

Figure 4: State-wise Rural Domestic Water Demand - 2011 and 2025 (MCM)

The district-wise representation in Figure 1 highlights a clear level wise representation in rural water demand. The districts like Mandya, Krishnagiri, Tiruchirappalli, Dindigul, and Pudukottai forms a secondary group which contributes between 25 – 30 MCM, while districts like Erode, Idukki, Thiruvarur and Namakkal fall in the moderate demand category. The districts like Nilgiris, Ramanagara and Karaikal (region) reflects smaller rural population. The spatial pattern of the water demand is shown in Figure 5 corresponds with the values in Table 3. The projected distribution in Figure 6 indicates a gradual increase in demand, particularly in Krishnagiri, Cuddalore, and Bengaluru Urban.

From the projected values, it can be observed that there is a steady increase in rural demand from 846 MCM by the year 2025, which is a 17% of growth from the year 2011. District level trends show continued dominance of high populated districts like Krishnagiri and Coimbatore, however these population may differ from actual outcomes due to rural to urban rural-to-urban migration driven by infrastructure availability. So, the increasing trend in the states reflects the gradual demographic growth rather than expansion.

Table 3: Domestic population and water demand projection (Rural)

Name	Number of villages		Number of households	Population			Projected population in 2025	Water demand in MCM	
	Inhabited	Uninhabited		Persons	Males	Females		2011	2025
Ariyalur	189	24	175,903	671,100	333,253	337,847	752,646	13.47233	15.10936
Coimbatore	219	18	242,157	839,105	419,032	420,073	1,064,995	16.84503	21.37977
Cuddalore	799	29	423,473	1,720,725	868,861	851,864	2,067,806	34.54355	41.51121
Dharmapuri	448	38	310,409	1,245,931	643,215	602,716	1,540,019	25.01206	30.91588
Dindigul	330	32	350,970	1,351,735	678,605	673,130	1,590,333	27.13608	31.92593
Erode	287	19	323,502	1,093,768	552,393	541,375	1,276,408	21.95739	25.6239
Karur	169	1	168,396	629,976	312,628	317,348	754,643	12.64677	15.14947
Krishnagiri	602	53	342,859	1,451,446	742,444	709,002	1,882,565	29.13778	37.7925
Nagapattinam	486	5	323,350	1,251,826	619,369	632,457	1,404,573	25.13041	28.1968
Namakkal	362	27	283,248	1,030,476	520,684	509,792	1,262,510	20.68681	25.34489
Perambalur	147	12	123,945	468,060	233,926	234,134	565,754	9.396305	11.35751
Pudukkottai	732	18	310,285	1,301,991	645,505	656,486	1,504,457	26.13747	30.20197
Salem	517	68	452,023	1,707,934	883,274	824,660	2,088,178	34.28678	41.92017
Thanjavur	789	16	391,202	1,554,531	765,177	789,354	1,744,014	31.20721	35.01108
Nilgiris	40	0	83,021	299,739	145,909	153,830	285,116	6.01726	5.723708
Thiruvarur	538	9	261,999	1,006,482	499,954	506,528	1,122,531	20.20513	22.53481
Tiruchirappalli	431	40	357,244	1,384,257	688,552	695,705	1,633,782	27.78896	32.79817
Tiruppur	297	0	283,187	957,941	479,309	478,632	1,369,835	19.23067	27.49943
Karaikal	28	0	25,521	102,120	50,138	51,982	127,578	2.050059	2.561132
Bengaluru Rural	957	94	164814	722179	371369	350810	893,763	14.49774	17.94229
Bengaluru Urban	465	20	176276	717084	383213	333871	1,231,889	14.39546	24.73018
Chamarajanagar	428	81	204137	845817	424884	420933	914,447	16.97978	18.35753
Chikkaballapura	1324	189	220987	973985	494463	479522	1,102,179	19.55275	22.12624
Chikmagalur	1,022	95	218,247	898,453	447,545	450,908	1,057,041	18.03644	21.2201
Hassan	2418	156	341634	1399658	695583	704075	1,462,368	28.09813	29.35704
Kodagu	291	5	121989	473531	234161	239370	480,747	9.506135	9.650995
Mandya	1368	109	355271	1497407	751243	746164	1,547,642	30.06045	31.06892
Mysuru	1199	137	406952	1755714	887500	868214	2,099,761	35.24596	42.15271
Ramanagara	820	52	199673	814877	412438	402439	873,118.00	16.35865578	17.52784385
Tumakuru	2,582	133	497,521	2,079,902	1,048,710	1,031,192	2,186,872	41.75403	43.90145
Idukki	64	0	267208	1056929	527245	529684	1,030,493	21.21785	20.68715
Palakkad	131	0	482285	2133124	1031466	1101658	2,355,882	42.82246	47.29433
Wayanad	48	0	183375	785840	386283	399557	838,190	15.77574	16.82667

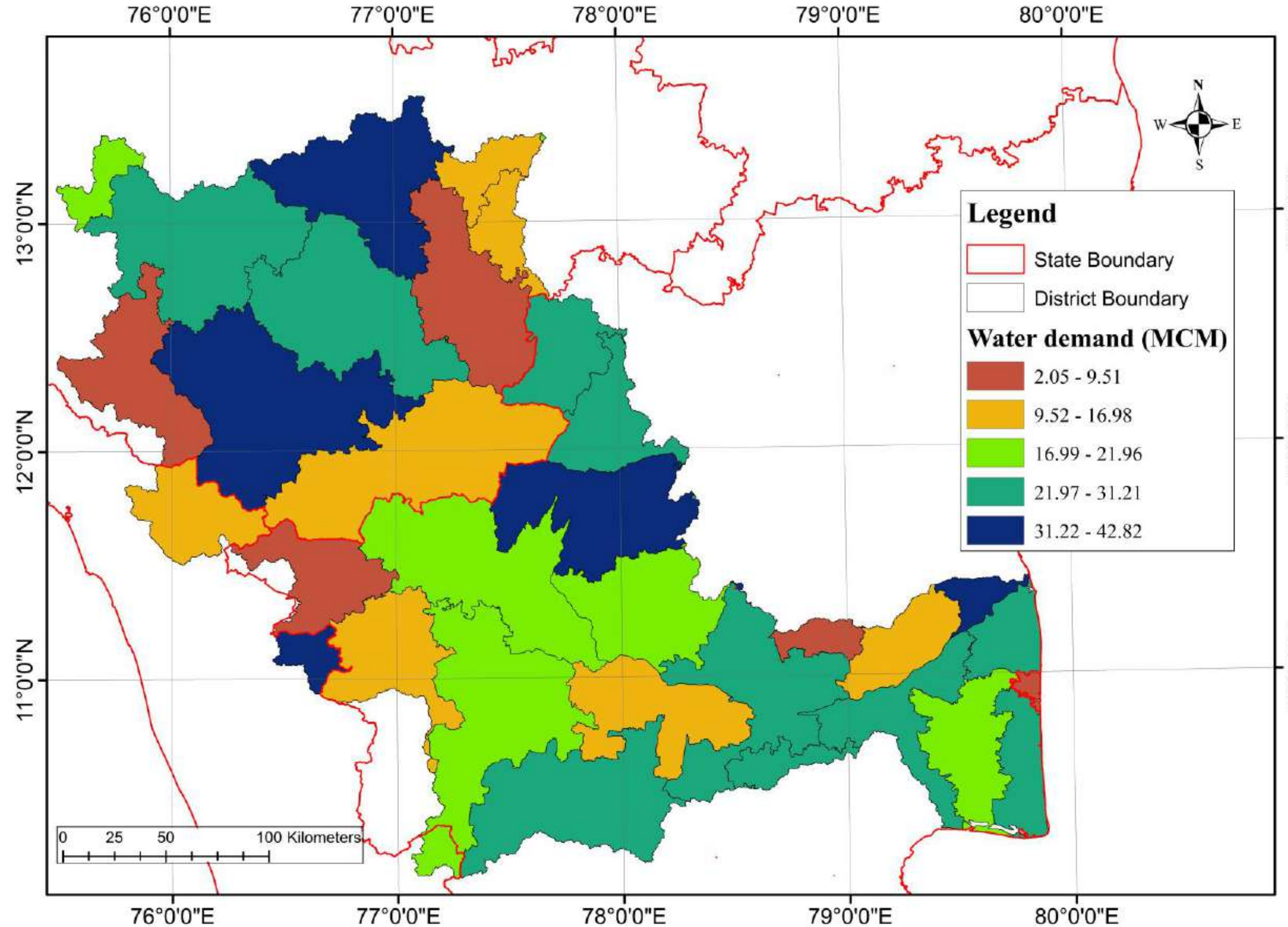

Figure 5: Spatial distribution of rural domestic water demand in the Cauvery River Basin - 2011 (MCM)

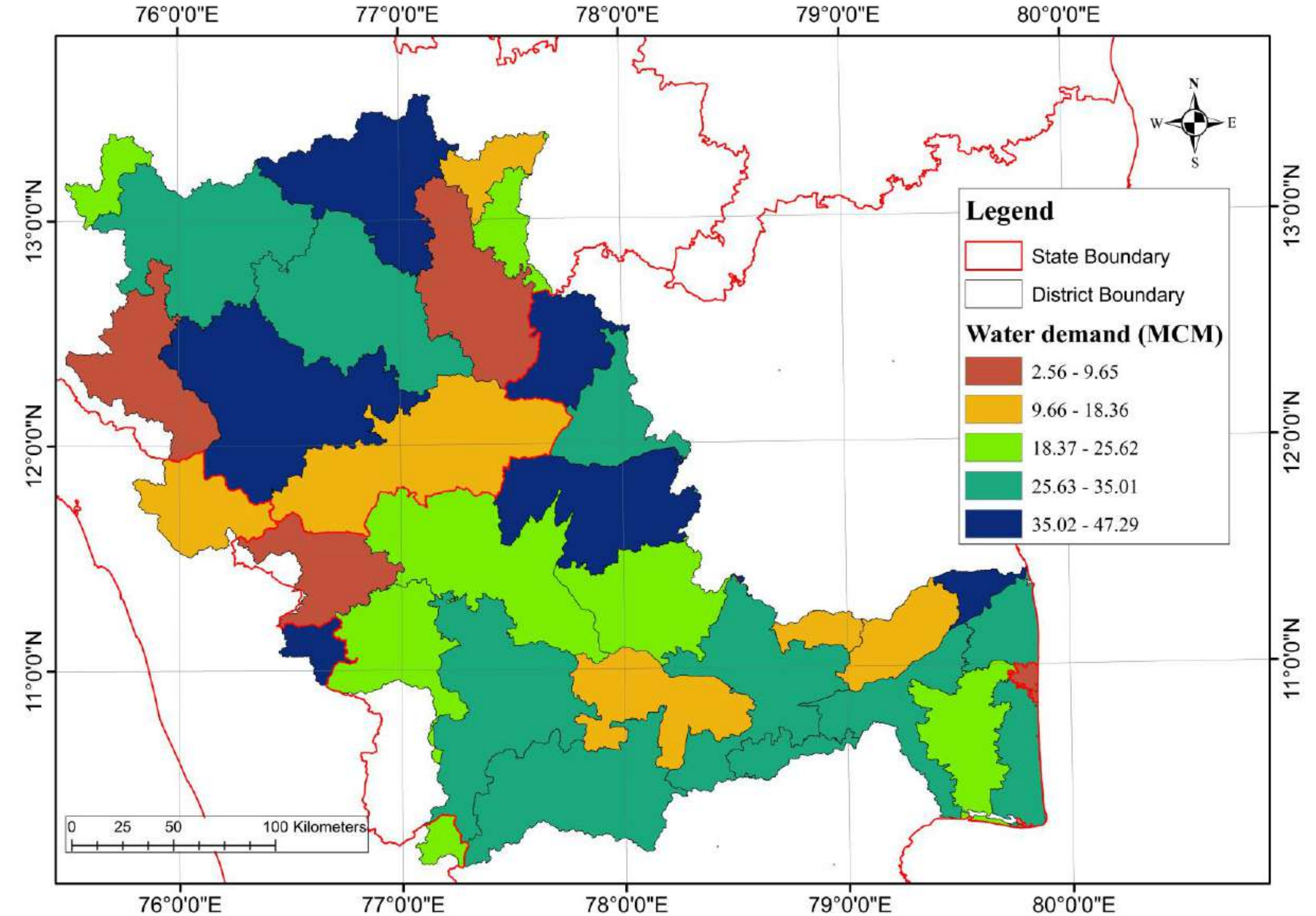

Figure 6: Spatial distribution of rural domestic water demand in the Cauvery River Basin - 2025 (MCM)

2.2.2 Urban Domestic Water Demand

Urban areas represent the fastest-growing component of domestic water demand within the basin. As a result, compared to rural regions, the water demand in the upcoming years is expected to be quite high. The projected urban domestic water demand given in Table 4 shows a quantitative assessment of water requirements in urban region within the CRB. The spatial distribution of district-wise urban demand for the base year and projection period (2025) is illustrated in Figure 9 and Figure 10.

The basin includes approximately 687 towns, having nearly 7.51 million urban households and a population of 29.36 million. By the urban supply norm of 140 LPCD, the total urban domestic water demand for 2011 is estimated at approximately 1,417 MCM per year.

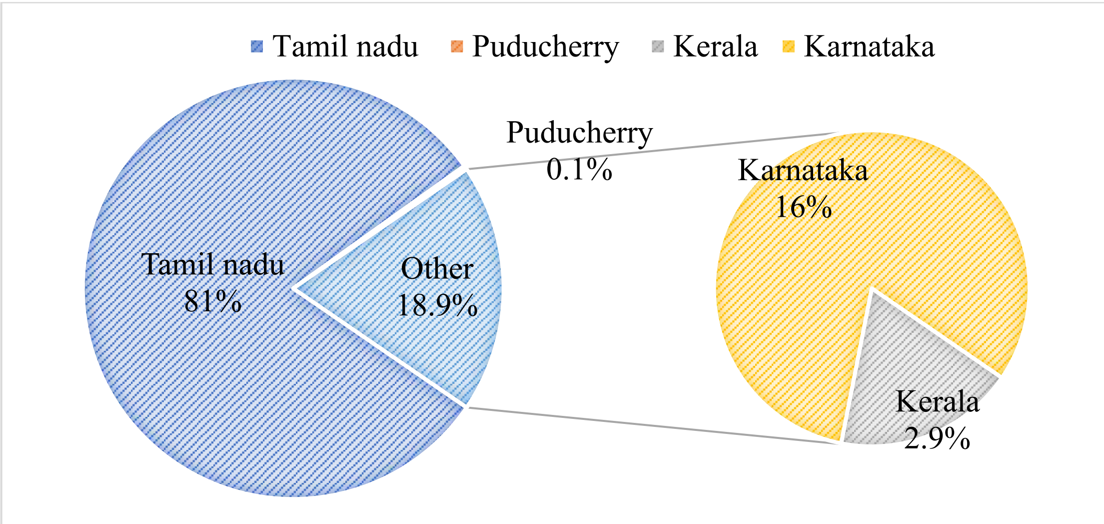

Figure 7: State-wise distribution of statutory towns within the CRB

The distribution of towns within the CRB across basin states is shown above in Figure 7. From the figure state of Tamil Nadu presents the largest share with about 561 towns (81%), followed by Karnataka with 101 towns (16%), Kerala 23 towns (2.9%), and Puducherry (Karaikal) with 2 towns i.e., 0.1%. The state of Karnataka has strong urban demand in the Bengaluru city which drastically influences the CRB, comparatively to the widespread of the municipalities in the state of Tamil Nadu. The state-wise contribution to urban domestic water demand is further illustrated in Figure 8.

The urban domestic water demand (district level) is shown in Table 4 , where Bengaluru Urban (444.53 MCM) dominates, followed by Coimbatore (133.83 MCM), Salem (90.66 MCM), Tiruppur (77.73 MCM), and Tiruchirappalli (68.37 MCM), reflecting concentrated urban populations and industrial activity. Moderate demand levels are observed in Erode, Cuddalore, Thanjavur, Dindigul, and Namakkal, whereas districts such as Perambalur, Karaikal, Idukki, and Wayanad contribute marginally due to smaller urban populations. The urban domestic water demand presents us with significant steady increase in trend over the planning period, rising to 1,417 MCM in 2011 to 1,928 MCM by 2025, shows an increase of 36% which is higher than rural demand growth.

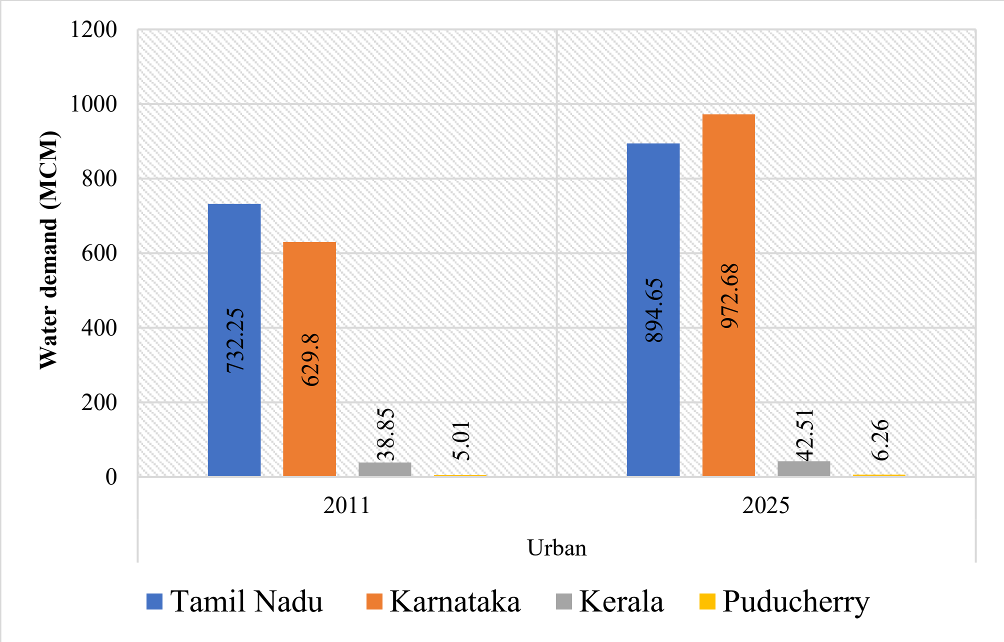

Figure 8: Projected water demand for each state year-wise

Figure 8 presents the projected urban domestic water demand across the CRB states for 2011 & 2025. From the graph it can be noted that the largest share of the demand from Karnataka is from the rapid urbanization of Bengaluru metropolitan region. In contrast the state of Tamil Nadu has major cities like Coimbatore, Erode, Tiruppur in the western part, the cities of Trichy, Salem and Tanjore in the lower part or at the central part of the CRB and at the delta shows a widespread of the population.

In contrast, limited or declining trends are observed in a few districts. Nilgiris decreased marginally from 22.26 MCM to 19.72 MCM, and Idukki from 2.66 MCM to 2.50 MCM, corresponding to relatively lower population growth. Overall, the projections in Table 4 and the spatial patterns in Figure 9 and Figure 10 indicate a substantial increase in urban domestic water demand, driven primarily by continued urbanization and the expansion of metropolitan regions within the basin.

Table 4: Domestic (Urban) population and water demand projection

Name	Number of towns	Number of households	Population			Projected population in 2025	Water demand in MCM	
			Persons	Males	Females		2011	2025
Ariyalur	4	21,187	83,794	41,450	42,344	93,976	4.2818734	4.802167
Coimbatore	69	715,878	2,618,940	1,310,265	1,308,675	3,323,967	133.827834	169.8547
Cuddalore	30	212,105	885,189	442,836	442,353	1,063,737	45.2331579	54.35697
Dharmapuri	13	65,464	260,912	131,088	129,824	322,497	13.3326032	16.47961
Dindigul	34	209,803	808,040	402,333	405,707	950,669	41.290844	48.57919
Erode	59	334,569	1,157,976	577,475	580,501	1,351,338	59.1725736	69.05336
Karur	19	118,699	434,517	215,556	218,961	520,505	22.2038187	26.59778
Krishnagiri	14	105,194	428,363	217,788	210,575	555,599	21.8893493	28.39109
Nagapattinam	14	90,487	364,624	178,758	185,866	409,115	18.6322864	20.90579
Namakkal	34	192,263	696,125	348,596	347,529	852,873	35.5719875	43.58179
Perambalur	5	25,298	97,163	48,231	48,932	117,443	4.9650293	6.001333
Pudukkottai	16	77,394	316,354	157,683	158,671	365,549	16.1656894	18.67953
Salem	68	463,944	1,774,122	898,297	875,825	2,169,102	90.6576342	110.8411
Thanjavur	34	214,161	851,359	417,239	434,120	955,132	43.5044449	48.80723
Nilgiris	18	114,632	435,655	214,234	221,421	414,402	22.2619705	21.17592
Thiruvarur	11	65,220	257,795	126,739	131,056	287,519	13.1733245	14.69223
Tiruchirappalli	31	341,160	1,338,033	663,732	674,301	1,579,225	68.3734863	80.69842
Tiruppur	49	429,023	1,521,111	766,850	754,261	2,175,156	77.7287721	111.1504
Karaikal	2	24,184	98,102	47,671	50,431	122,558	5.0130122	6.262739
Bengaluru Rural	7	64465	268744	137803	130941	332,595	13.7328184	16.99562
Bengaluru Urban	14	2166475	8699193	4530193	4169000	14,944,475	444.528762	763.6627
Chamarajanagar	5	40737	174974	87347	87627	189,172	8.9411714	9.666666
Chikkaballapura	8	63711	281119	141974	139145	318,119	14.3651809	16.2559
Chikmagalur	9	57,838	239,508	119,077	120,431	281,784	12.2388588	14.39917
Hassan	11	91819	376763	188084	188679	393,643	19.2525893	20.11518
Kodagu	5	20727	80988	40447	40541	82,222	4.1384868	4.201551
Mandya	9	73354	308362	153842	154520	318,707	15.7572982	16.28593
Mysuru	19	294016	1245413	624100	621313	1,489,462	63.6406043	76.11153
Ramanagara	6	60860	267759	135570	132189	286,896.00	13.6824849	14.6603856
Tumakuru	12	142,560	599,078	301,884	297,194	629,889	30.6128858	32.18731
Idukki	1	12604	52045	25563	26482	50,743	2.6594995	2.592981
Palakkad	21	154935	676810	328012	348798	747,488	34.584991	38.19663
Wayanad	1	7519	31580	15401	16179	33,684	1.613738	1.721241

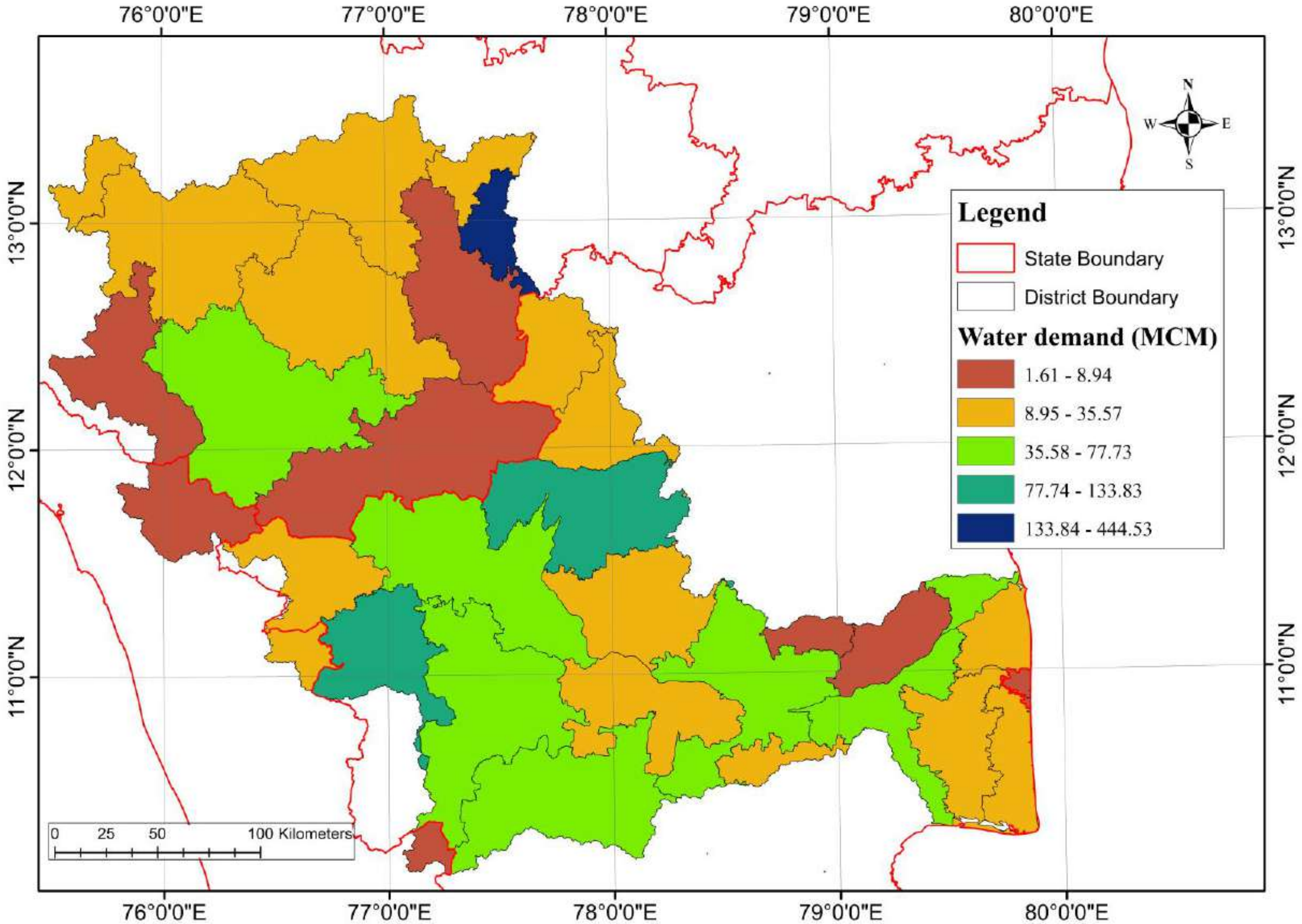

Figure 9: Spatial distribution of urban domestic water demand in the Cauvery River Basin - 2011 (MCM)

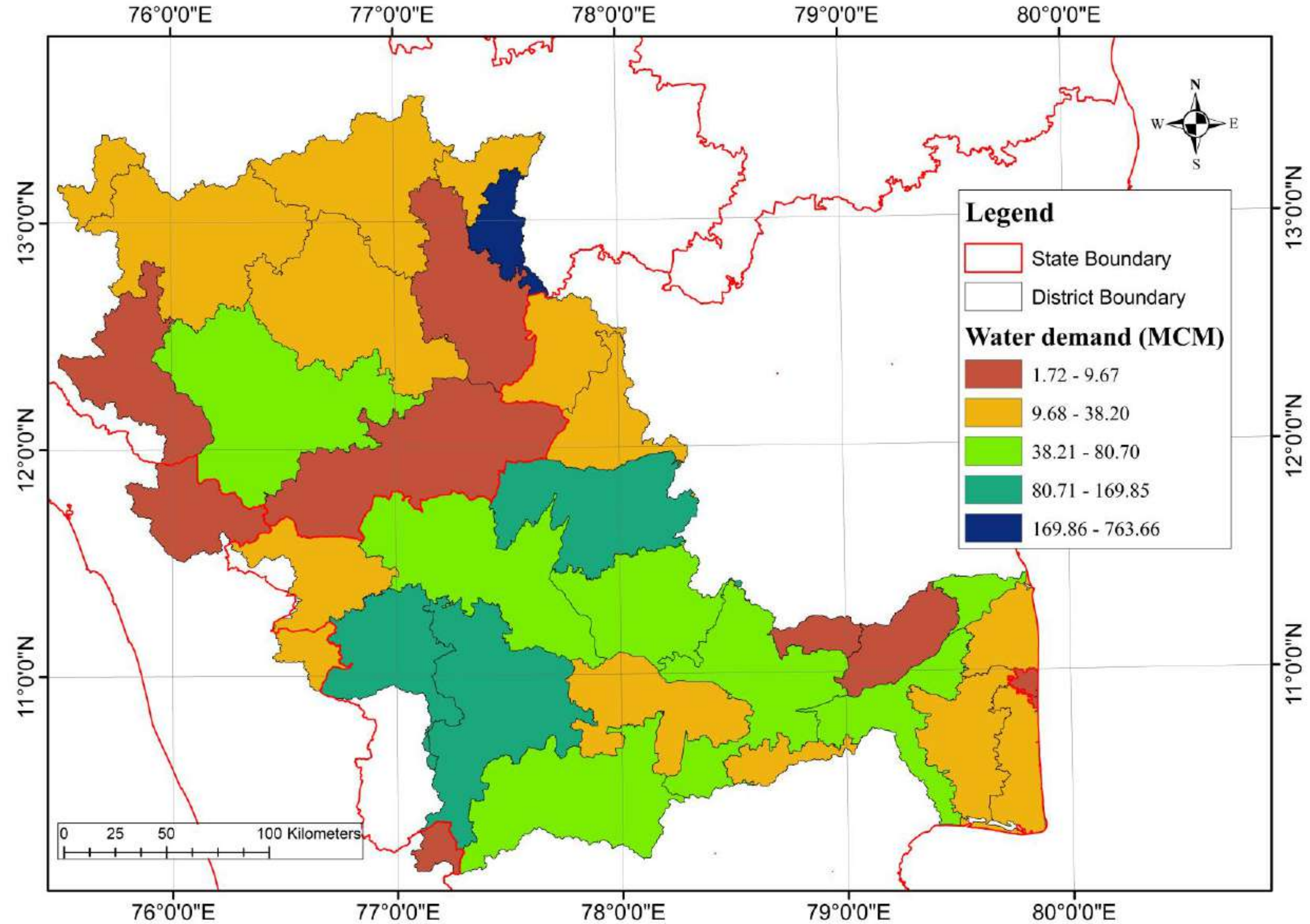

Figure 10: Spatial distribution of urban domestic water demand in the Cauvery River Basin - 2025 (MCM)

2.2.3 Combined Rural & Urban Interpretation

When rural and urban components are combined, the total domestic water demand of the CRB shows a clear increasing trend. The estimation is based on state-wise population data for both base and projected years, integrated with applicable per capita water demand norms. The aggregated population values used for this assessment are presented in Table 5, forming the basis for subsequent demand calculations.

Table 5: Total population across CRB

State	Population					
	Urban		Rural		Total	
	2011	2025	2011	2025	2011	2025
Tamil Nadu	14330072	17507801	19967023	23910164	34297095	41417966
Karnataka	12541901	19266965	12178607	13849828	24720508	33116793
Kerala	760435	831915	3975893	4224566	4736328	5056480
Puducherry	98102	122558	102120	127578	200222	250137

Table 6: Total domestic demand (Rural + Urban)

State	Water demand in MCM					
	Urban		Rural		Total	
	2011	2025	2011	2025	2011	2025
Tamil Nadu	732.25	894.65	400.87	479.99	1133.12	1374.64
Karnataka	640.89	984.56	244.5	278.04	885.39	1262.6
Kerala	38.85	42.51	79.82	84.81	118.67	127.32
Puducherry	5.01	6.26	2.05	2.56	7.06	8.82

The combined rural and urban domestic water demand estimates presented in Table 6 indicate a consistent increase in total water requirements within the CRB over the planning horizon. Total demand rises progressively from the base year 2011 through the projected year 2025.

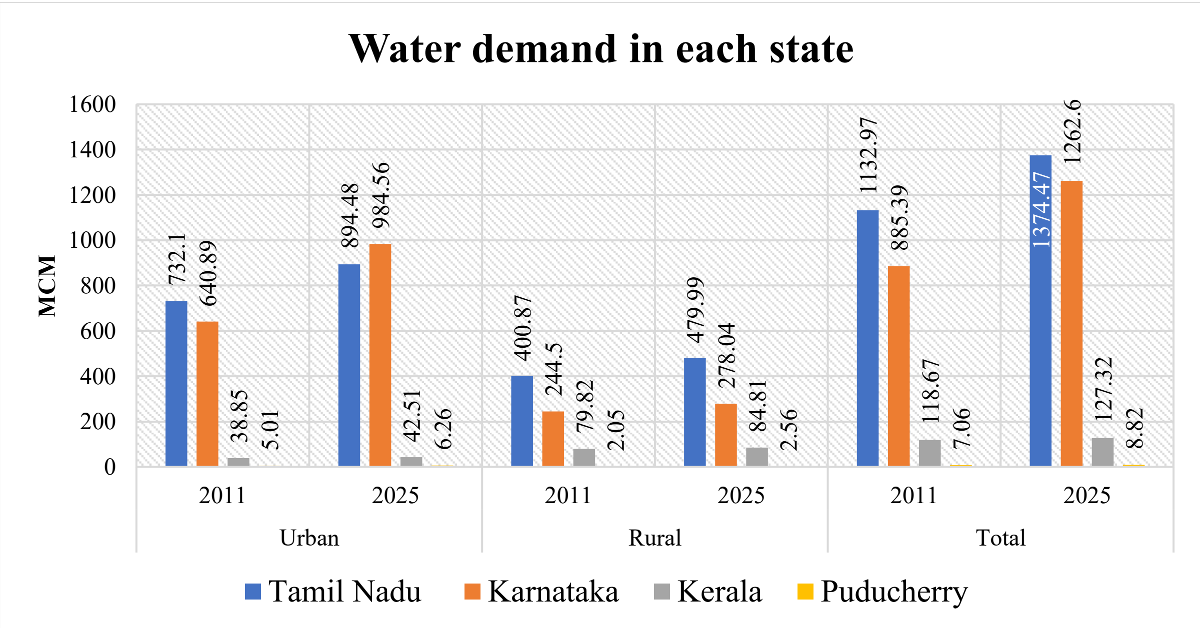

Figure 11: State-wise domestic water demand (2011 & 2025)

This increase is largely driven by the expansion of urban population and higher service-level water supply standards in cities. In comparison, rural demand shows moderate growth, resulting in urban demand constituting the dominant share of total domestic consumption. The state-wise distribution of rural, urban, and total domestic water demand for 2011 and 2025 is presented in Figure 11. The projections indicate a sustained increase in domestic water demand within the CRB, driven primarily by urban expansion. As reflected in Table 6 and Figure 11, total demand rises steadily across all projection years, with urban consumption forming the dominant share.

By 2025, urban demand is projected to account for approximately 69.5 % of total domestic requirements, while rural demand shows comparatively moderate growth. The increase is spatially concentrated in a limited number of high-growth districts, particularly Bengaluru Urban and western Tamil Nadu cities, indicating uneven pressure on basin resources. The results highlight a structural shift in demand patterns, where metropolitan growth, rather than rural population increase, is becoming the primary driver of basin-level domestic water demand. Urban demand alone is projected to reach approximately 1,928 MCM by 2025, significantly increasing pressure on available water resources.

In summary, the domestic water demand assessment for the CRB indicates a total combined demand of approximately 2,144 MCM for the base year 2011, projected to increase to approximately 2,773 MCM by 2025 a basin-wide growth of approximately 29.3 % over the planning horizon. Th estimated Rural demand of 728 MCM in 2011, is projected to reach approximately 846 MCM by 2025, reflecting a moderate increase of approximately 16 percent driven by population growth and expanding rural water supply coverage under the Jal Jeevan Mission. Urban demand, estimated at approximately 1,417 MCM in 2011, is projected to reach approximately 1,928 MCM by 2025, a substantially higher growth rate of approximately 36%, driven predominantly by metropolitan expansion in Bengaluru Urban, Coimbatore, Tiruppur, and Salem. The spatial pattern of demand growth is highly asymmetric: a small number of high-growth metropolitan and industrial districts account for a disproportionate share of incremental demand, while smaller rural and highland districts contribute comparatively little to aggregate demand growth. This asymmetry has direct implications for inter-district water allocation, infrastructure prioritization, and the long-term sustainability of water supply systems within the basin.

3. INDUSTRIAL WATER REQUIREMENT

About 20% of all freshwater withdrawals come from the industrial sector, which is the world's second-largest consumer after agriculture. As industrialization grows in developing nations, demand is predicted to rise. (Shiklomanov, 2000). Industrial water use varies across sectors, with higher consumption observed in industries such as paper, textiles, chemicals, and sugar, compared to relatively lower use in light manufacturing (Gleick, 2003). Increasing competition among industrial, agricultural, and domestic sectors, coupled with pollution and over-extraction, is placing significant stress on freshwater systems (Vörösmarty et al., 2010). In India, industry currently accounts for about 8 percent of total freshwater withdrawals, with further growth anticipated due to expansion in water-intensive sectors such as thermal power, textiles, steel, cement, and agro-processing (CGWB, 2017).

Within the CRB, industrial activity reflects considerable diversity. Tamil Nadu is characterised by cement, sugar, and textile industries, while Kerala includes agro-processing, Ayurvedic manufacturing, and hydropower, and the Karaikal region supports chemical and ceramic industries. Industrial water demand data for this study is sourced from the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), with reference year of 2015 to all states. The dataset includes current demand, projected demand, and available supply potential across industrial categories.

This section presents a district-level assessment of industrial water demand, focusing on dominant water-intensive sectors, spatial distribution patterns, and the gap between available supply and projected demand.

3.1 Tamil Nadu

Industrial water demand data for Cuddalore, Nilgiris, Nagapattinam, Mayiladuthurai, Tiruppur, and Thiruvarur were unavailable in the PMKSY report and are excluded from this analysis. The overall data from the report for each district shows a substantial change in the trend for each district and also shows a significant concentration of industries in cities like Erode, Trichy, Salem and Namakkal. In Tamil Nadu the district with highest individual water demand is shown to Tiruchirappalli where the demand records to highest value with 0.5957 BCM in 2015, rising to 0.690 BCM in 2020, which clearly shows the rise of approximately 0.0953 BCM. Erode follows closely at 0.5421 BCM in 2015, growing substantially to 0.8131 BCM by 2023, representing an addition of roughly 0.2710 BCM and marking one of the sharpest absolute increases in the dataset. Salem rises from 0.2164 BCM in 2015 to 0.3039 BCM by 2020, while Karur increases from 0.1520 BCM to 0.2528 BCM by 2023, both reflecting significant projected growth. Dindigul grows from 0.1235 BCM in 2015 to 0.1729 BCM by 2020, and Coimbatore increases from 0.1162 BCM to 0.1337 BCM over the same period. Pudukkottai more than doubles from 0.0141 BCM in 2015 to 0.0299 BCM by 2020, while Krishnagiri similarly shows a sharp proportional rise from 0.00175 BCM to 0.003 BCM by 2023. Dharmapuri records a marginal increase from 0.008532 BCM to 0.009385 BCM by 2023, and Perambalur shows near-stable demand, changing from 0.00157 BCM to 0.00173 BCM. Thanjavur registers the lowest demand among districts with available data, rising marginally from 0.000423 BCM to 0.000466 BCM by 2020. Notably, Ariyalur shows a decline from 0.1070 BCM in 2015 to 0.0996 BCM by 2023, making it the only district in the dataset with a projected decrease in industrial water demand. Namakkal reports a 2015 demand of 0.0616 BCM but lacks a projected value, while Nagapattinam has no 2015 baseline but shows a projected demand of 0.0625 BCM by 2023. Direct inter-district comparison of predictions is limited since Coimbatore, Dindigul, Pudukkottai, Salem, Thanjavur, and Tiruchirappalli are projected to 2020, while Ariyalur, Dharmapuri, Erode, Karur, Krishnagiri, Nagapattinam, and Perambalur are projected to 2023.Overall the major water demand is at the Tiruchirappalli, Erode, Salem, and Karur in comparison the districts like Perambalur & Thanjavur shows low water demand, which translates to their varying demand in other sector or due to the low development in the district namely Perambalur.

It is to be noted that the calculation and projected values of some districts can be different due to the sudden development industrial sectors in the areas like Krishnagiri. The projected value of each district is given below in the table .

Table 7: Industrial water demand for the districts of Tamil Nadu for the year 2015 and projected year (BCM)

Name	Water demand in 2015 (BCM)	Projected water demand in BCM	
		2020	2023
Ariyalur	0.107047	-	0.09963
Coimbatore	0.11622	0.13365	-
Cuddalore	-	-	-
Dharmapuri	0.008532	-	0.009385
Dindigul	0.123481	0.172873	-
Erode	0.54208	-	0.813124
Karur	0.152022	-	0.252837
Krishnagiri	0.00175	-	0.003
Nagapattinam	-	-	0.062481
Namakkal	0.06163652	-	-
Perambalur	0.00157	-	0.00173
Pudukkottai	0.014144	0.029894	-
Salem	0.216401	0.303925	-
Thanjavur	0.000423435	0.000466	-
Nilgiris	-	-	-
Thiruvarur	-	-	-
Tiruchirappalli	0.5956698	0.690977	-
Tiruppur	-	-	-

3.2 Karnataka

The industrial water demand for the districts of Karnataka state indicates the varying trends between 2015 and the projected year 2020. Bengaluru Rural records the highest industrial water demand among the Karnataka districts in the basin at 0.247 BCM in 2015, rising to 0.307 BCM by 2020, an increase of 0.060 BCM reflecting continued industrial expansion in the peri-urban belt around Bengaluru. Tumakuru shows moderate demand at

0.0397 BCM in 2015, growing to 0.0442 BCM by 2020, indicating steady but modest industrial growth. Kodagu registers 0.025 BCM in 2015 and increases to 0.037 BCM by 2020, an addition of 0.012 BCM. Ramanagara shows a notable proportional increase from 0.003285 BCM in 2015 to 0.01314 BCM by 2020, nearly quadrupling its industrial water demand over the projection period. Mandya records a very low baseline of 0.000117 BCM in 2015, rising marginally to 0.00016 BCM by 2020. Bengaluru Urban, despite its densely urbanized character, registers a very low industrial water demand of 0.000179 BCM in 2015, increasing sharply to 0.018092 BCM by 2020, a roughly hundredfold increase that likely reflects reclassification or expansion of industrial water allocation within the urban jurisdiction. Mysuru reports zero industrial water demand in 2015 and lacks a projected value, representing a significant data gap.

Table 8: Industrial water demand for the districts of Karnataka for the year 2015 and projected years (BCM)

Name	Water demand in 2015 (BCM)	Projected water demand in 2020 (BCM)
Bengaluru Rural	0.247	0.307
Bengaluru Urban	0.000179218	0.018092
Chamarajanagar	-	-
Chikkaballapura	-	-
Chikmagalur	-	-
Hassan	-	-
Kodagu	0.025	0.037
Mandya	0.000117011	0.00016
Mysuru	-	-
Ramanagara	0.003285	0.01314
Tumakuru	0.039681567	0.044182

Industrial water demand data for Hassan, Mysuru, and Chamarajanagar districts were not available in the PMKSY District Irrigation Plans and are excluded from this analysis.

3.3 Kerala

The CRB in the Kerala holds a little area compared to the other major states like Tamil Nadu and Karnataka. The district with major portion with CRB boundary is Wayanad followed by the Palakkad and Idukki. Here Idukki also comes in part of Periyar river basin, so the demand and extraction are water from each river is clearly stated on the DIP report. Among the three Kerala districts within the CRB, Wayanad records the highest industrial water demand at 0.02089 BCM in 2015, rising to 0.027542 BCM by 2020, an increase of approximately 0.006652 BCM. Palakkad follows at 0.001214 BCM in 2015, growing to 0.003348 BCM by 2020, nearly tripling its demand over the projection period. Idukki registers the lowest industrial water demand among all districts in the entire dataset at 0.000008 BCM in 2015, rising to 0.000015 BCM by 2020, a near-doubling in proportional terms but remaining negligible in absolute volume. The water demand for the industrial sector is observed to be low due to the geographical factors and concentration of industries in the coastal regions or in the plain areas of the Kerala state where the above three districts are distinctively present in the highlands of western ghats. The projected values across the three districts is given below in the table .

Table 9: Industrial water demand for the districts of Kerala for the year 2015 and projected year (BCM)

Districts	Water demand in 2015	Projected water demand in 2020
Idukki	0.000007665	0.00001533
Palakkad	0.001214	0.0033479
Wayanad	0.02089032	0.02754238

3.4 Puducherry (Karaikal)

The region of Karaikal (Puducherry) shows a distinctive position where it is completely present in the delta region of the CRB and also makes it to completely depend on the freshwater resource namely the Cauvery River for industrial and commercial purpose. The total industrial water demand in the Union territory is reported at 1.97×10^{-3}BCM for the year 2015 as reported in the PMKSY report, which is totalled from 62 identified industries. The projected water demand for the region is not reported and presents a major gap by which making any forward-looking demand assessment impossible.

3.5 Summary

The industrial water demand assessment across the CRB reveals pronounced spatial concentration and significant data limitations that constrain comprehensive evaluation. Within the Tamil Nadu segment, Tiruchirappalli records the highest present industrial water demand at 0.5957 BCM, driven by a combination of defence manufacturing, public sector heavy engineering, and a large medium and small-scale industrial base. Erode (0.5421 BCM) follows, with demand heavily skewed toward a single block (Chennimalai), while Salem (0.2164 BCM) ranks third. At the lower end, Thanjavur (0.000423 BCM) and Krishnagiri (0.00175 BCM) register near-negligible industrial water demand. A critical finding across multiple districts is that a small number of water-intensive industries particularly in cement (Ariyalur), textiles (Erode, Coimbatore), paper (Dindigul, Salem, Namakkal), and sugar processing (Karur, Mandya) account for disproportionately large shares of district-level demand, while numerically dominant small-scale categories often contribute marginal volumes.

In Karnataka, Bengaluru Rural (0.247 BCM) and Tumakuru (0.0397 BCM, dominated by Vasantha Narasapura Industrial Area) represent the primary industrial demand centres, while districts such as Kodagu (0.025 BCM) and Mandya (0.000117 BCM) register minimal industrial water requirements. Industrial water demand data for Hassan, Mysuru, and Chamarajanagar are entirely unavailable and are excluded from this assessment. Karaikal's industrial demand of 1.97 MCM is dominated by a single power corporation and a chemical plant, together accounting for approximately 78 percent of the total.

The most significant limitation of the industrial sector assessment is the incomplete coverage of both demand and supply data. Industrial water demand data for Cuddalore, Nilgiris, Nagapattinam, Mayiladuthurai, Tiruppur, and Thiruvarur in Tamil Nadu are entirely unavailable from the PMKSY reports. Existing water potential and creation gap data are absent for Tiruchirappalli the highest-demand Tamil Nadu district as well as for Bengaluru Urban and most Karnataka districts. Several districts report demand figures that cover only a fraction of registered industries, meaning reported totals systematically underestimate actual consumption. The industrial sector assessment presented here therefore represents a partial inventory rather than a comprehensive basin-level quantification and should be interpreted within this limitation. Systematic compilation of industrial water use data from State Pollution Control Boards, District Industries Centres, and industrial development authorities is essential to enable a complete industrial water demand and supply assessment for the CRB

4. AGRICULTURAL WATER REQUIREMENT

Water underpins agricultural production, and managing it efficiently has become a defining challenge as population growth, urbanization, and industrial expansion compete for limited freshwater supplies (FAO, 2011). Globally, agriculture accounts for roughly 70 percent of freshwater withdrawals, a share whose sustainability is under growing pressure from climate variability and groundwater depletion (FAO, 2011; Shiklomanov, 2000). Changing hydrological regimes, including shifts in precipitation patterns, evapotranspiration rates, and runoff behaviour at watershed and basin scales, are expected to alter both the demand and supply sides of irrigation water (Rosenzweig et al., 2004). In India, the situation is more acute: over 80 percent of total freshwater use goes to agriculture, and despite sustained investment in irrigation infrastructure, the widening gap between potential created and potential utilized, compounded by accelerating groundwater decline, poses a serious long-term threat to food and water security (Narayanamoorthy, 2007). The study area spans districts in Tamil Nadu, Kerala, and the Union Territory of Karaikal, each with distinct agro-climatic conditions, cropping patterns, and irrigation dependencies.

Tamil Nadu's agricultural water supply depends largely on the northeast monsoon, supported by an extensive network of tanks and canal systems. Kerala, by contrast, receives approximately 90 percent of its annual rainfall during the southwest monsoon (June to August) and the northeast monsoon (October to November), with the intervening months being largely dry. Steep topography causes rapid drainage of rainwater to the sea, limiting natural storage and making supplemental irrigation essential for sustained cultivation (Irrigation Department, Kerala, 2025). This section estimates and interprets agricultural water requirements for the study area districts based on available cropping pattern data, irrigated area statistics, and established crop water requirement norms, covering the Tamil Nadu districts, the Kerala districts of Palakkad, Wayanad, and Idukki, and the Karaikal region.

Crop Water Requirement

Crop water requirement values for major agricultural crops have been adopted from standard references of TNAU Crop Production Guide, and PMKSY reports DIPs. Although detailed crop-specific values are available for certain regions such as Karnataka, the present analysis uses a generalized crop-category approach to maintain uniformity across all basin states. The adopted values represent total seasonal water requirement (mm) for each crop category and have been applied consistently across all states of the CRB to ensure comparability in agricultural water demand estimation.

Irrigation water demand has been estimated by combining crop-wise water requirement values with the corresponding cultivated area under each crop category. Here the agricultural water requirement values shown in this study represent the gross crop water requirement, calculated as the product of crop wise cultivated area and the corresponding seasonal crop water requirement norm. The effective rainfall is not deducted from these estimates, the reported values here represent the gross water requirement of crops instead of net irrigation demands. The following method is adopted to maintain a uniform methodological approach across all four states, as the application of district-specific effective rainfall corrections would require crop-season-wise rainfall disaggregation and soil-specific retention coefficients that vary significantly across the basin's diverse agro-climatic zones. The crop-wise water requirement values adopted for this estimation are presented in Table 10, applied uniformly across all districts and crop categories in the absence of district-specific agronomic data.

Table 10: Crop-wise water requirement values adopted for agricultural demand estimation in the CRB

Sl. No.	Crop Category	Crop Water Requirement (mm)
1	Paddy	1400
2	Cereals	450
3	Pulses	300
4	Oil Seeds	550
5	Coconut	2500
6	Fibre Crops	700
7	Banana	2200
8	Sugarcane	2200
9	Vegetables and Flowers	1600
10	Other Horticultural Crops	2500

4.1 Agricultural water requirement for Tamil Nadu

Within the CRB, Tamil Nadu supports the most irrigation-intensive agricultural system, anchored by the delta canal network that feeds paddy cultivation in the lower basin. Agricultural water demand for the Tamil Nadu districts has been estimated using crop-wise area and production data sourced from the Directorate of Economics and Statistics, Government of Tamil Nadu, covering three reference years: 2019-2020, 2022-2023, and 2023-2024. The total agricultural water demand aggregated across all Tamil Nadu CRB districts amounts to 26,739 MCM in 2019-2020, 24,034 MCM in 2022-2023, and 33,894 MCM in 2023-2024. The apparent increase in 2023-2024 is partly attributable to the inclusion of Vegetables and Fruits categories, which were unavailable in the 2022-2023 dataset.

The agricultural landscape of Tamil Nadu within the basin is sharply divided between two zones. In the lower basin, the delta districts of Thanjavur, Thiruvarur, Nagapattinam, and Cuddalore are overwhelmingly paddy-dependent, drawing water through a regulated canal system fed by reservoir releases. In the upper and western basin, districts such as Salem, Namakkal, Krishnagiri, and Dharmapuri maintain a more diversified cropping base that includes cereals, pulses, oilseeds, and cotton, though individually each crop accounts for less water than paddy does in the delta. This bifurcation is the defining feature of Tamil Nadu's agricultural water demand pattern. Figure 12 presents the crop-wise demand totals for the three reference years.

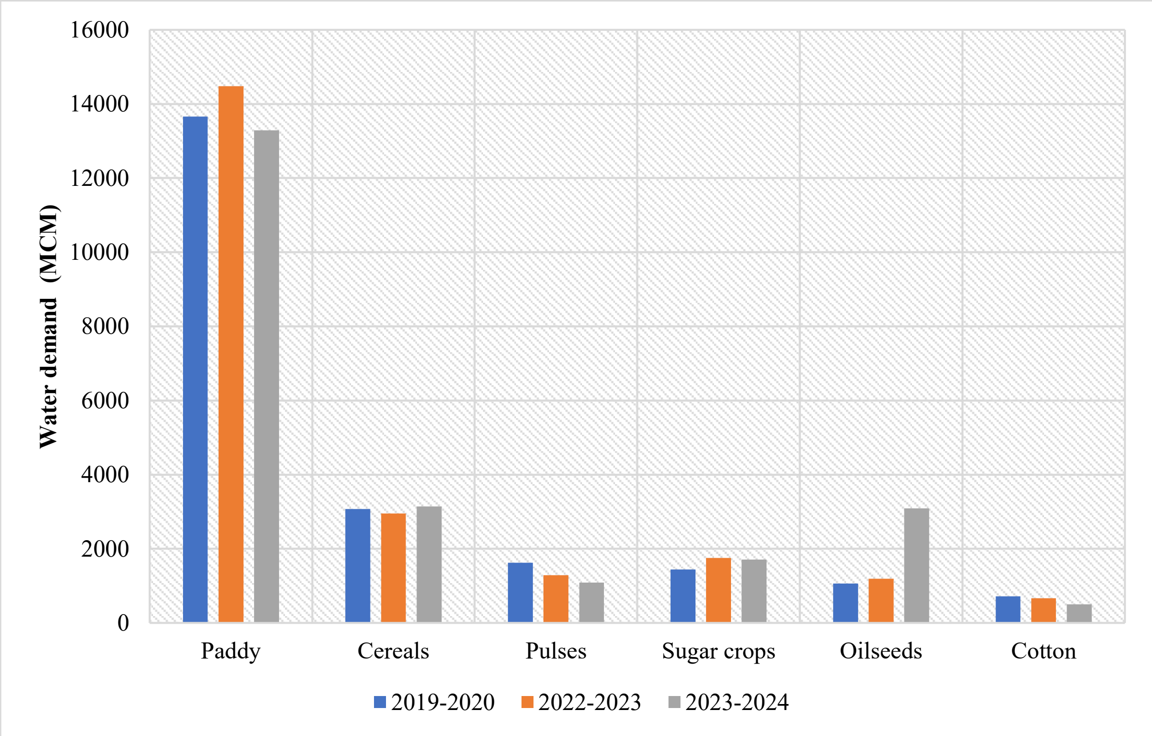

Figure 12: Crop-wise agricultural water demand in Tamil Nadu : 2019–2020, 2021–2022, and 2023–2024 (MCM)

4.1.1 Paddy

Paddy is the single largest contributor to agricultural water demand across Tamil Nadu's delta system. Thanjavur leads, with demand rising from 2,691.23 MCM in 2019–2020 to 3,161.72 MCM in 2022–2023 before pulling back slightly to 2,936.25 MCM in 2023–2024. Thiruvarur follows a comparable trajectory, climbing from 2,532.60 MCM to 3,140.37 MCM over the same period, effectively matching Thanjavur and confirming that the two delta districts are structurally co-equal in paddy irrigation demand. The increases between 2019–2020 and 2022–2023, approximately 470 MCM in Thanjavur and 607 MCM in Thiruvarur, point to either expanded paddy area or intensified irrigation during this period. Cuddalore (1,850.11–1,998.54 MCM) and Pudukkottai (1,229.33–1,342.74 MCM) constitute a secondary tier, both showing moderate upward trends.

The contrast with upland districts is sharp. Nilgiris records roughly 1–2 MCM of paddy demand, and Coimbatore only 5–16 MCM, confirming that paddy cultivation outside the delta is negligible in water demand terms. This spatial bifurcation, where the delta captures the overwhelming share of paddy irrigation demand while upland districts contribute minimally, is the most structurally significant pattern in Tamil Nadu's agricultural water profile. Figure 16 illustrates the spatial distribution of paddy water demand across all basin districts for each of the three reference years, with Thanjavur, Thiruvarur, and Cuddalore consistently falling in the highest demand classes and upland districts remaining in the lower classes across all panels.

4.1.2 Cereals

Cereal demand excluding paddy follows an inverse spatial pattern, concentrating in upland districts rather than the delta, which points to crop substitution between the two zones. Salem records the highest values, ranging from 495.05 MCM in 2019–2020 to 506.43 MCM in 2022–2023, then dropping to 307.64 MCM in 2023–2024. Namakkal shows a similar trajectory, moving from 377.69 MCM down to 320.90 MCM. The decline in both districts during 2023–2024 suggests either a contraction in cereal area or a shift toward alternative crops in the most recent year. Delta districts like Thanjavur and Thiruvarur register comparatively low non-paddy cereal demand, reinforcing the extent to which paddy dominates their cropping structure at the expense of other cereals.

Figure 17 maps this distribution across the basin. Salem and Namakkal appear in the highest demand classes in the 2019–2020 panel, with their shift to lighter shading in 2023–2024 reflecting the area reduction noted above. Delta districts remain consistently in the lower classes, an expected outcome given paddy's overwhelming dominance in those areas.

4.1.3 Pulses

Pulse cultivation concentrates in districts influenced by dryland and semi-arid conditions rather than the canal-irrigated delta. In 2019-2020, Cuddalore stands apart with a pulse demand of 1,150 MCM, a figure that appears elevated relative to the district's typical rainfed profile and may reflect a particularly favourable season or expanded pulse-rotation area. Nagapattinam (210 MCM), Thiruvarur (211 MCM), Salem (737 MCM), and Namakkal (555 MCM) form the next tier, while Krishnagiri (161 MCM), Dharmapuri (162 MCM), and Perambalur (473 MCM) also contribute notable volumes. However, pulse demand declines broadly by 2022-2023 and further by 2023-2024, particularly in Cuddalore (down to 159 MCM), suggesting that the high 2019-2020 figure was not sustained.

The basin-wide pulse total for Tamil Nadu drops from 1,621 MCM to 1,434 MCM to 1,230 MCM across the three years. This contraction warrants attention, since pulse cultivation has both agronomic benefits (nitrogen fixation, soil health) and nutritional importance; any sustained decline in pulse area could affect cropping system sustainability. Figure 18 maps the spatial distribution, with the marked reduction between the 2019-2020 and later panels visible across most districts.

4.1.4 Sugar Crops

Sugarcane demand is concentrated in Cuddalore, Erode, and Namakkal rather than the delta districts. Cuddalore leads but shows a slight decline from 335.46 MCM in 2019–2020 to 329.05 MCM in 2023–2024. Erode, by contrast, rises from 281.27 MCM to 442.33 MCM, the largest absolute increase in sugar crop demand among all Tamil Nadu districts over the study period. This divergence between a stable-to-declining Cuddalore and a rising Erode suggests a geographic shift in sugarcane cultivation within the Tamil Nadu segment.

Figure 20 presents the spatial pattern, with Erode's progressively darker shading tracking its increasing demand trajectory. Thanjavur and Thiruvarur remain in the lowest classes throughout, spatially separating sugarcane cultivation from the paddy-dominant delta system.

4.1.5 Oilseeds

Namakkal is the only Tamil Nadu district where oilseed demand increases monotonically across all three study years, rising from 185.16 MCM in 2019–2020 to 230.78 MCM in 2023–2024. Salem and Erode contribute moderate volumes, while delta and highland districts record minimal values. Combined with its high cereal and pulse demand, this trend positions Namakkal as the most agriculturally diversified high-demand district in the Tamil Nadu segment outside the delta. Figure 21 maps oilseed water demand across the basin. Tumakuru and Chikkaballapura in Karnataka record the highest values basin-wide, but within Tamil Nadu, Namakkal clearly leads.

4.1.6 Cotton

Cotton cultivation contributes a smaller and generally declining share of agricultural water demand. Perambalur records the highest value at 143.96 MCM in 2019–2020, falling sharply to 55.64 MCM by 2023–2024. Salem (98.10 to 46.24 MCM) and Tiruchirappalli (94.32 to 67.38 MCM) follow similar downward paths. The consistency of this decline across multiple districts points to a basin-wide contraction in cotton cultivation within Tamil Nadu, reducing total agricultural water demand from this crop category over the study period. Figure 19 illustrates fibre crop water demand spatially, with progressively lighter shading across Tamil Nadu districts between the 2019–2020 and 2023–2024 panels reflecting this trend.

4.1.7 Vegetables, Fruits, and Overall assessment agricultural water requirement for Tamil Nadu

Vegetables and Fruits data are available only for 2019-2020 and 2023-2024. In 2023-2024, vegetable demand totals 3,746 MCM, led by Dharmapuri (703 MCM), Krishnagiri (529 MCM), Salem (520 MCM), and Namakkal (412 MCM), all upland districts where horticultural cultivation complements dryland agriculture. Fruit demand totals 5,612 MCM, with Cuddalore (827 MCM), Krishnagiri (740 MCM), Dindigul (689 MCM), and Ariyalur (695 MCM) leading. The inclusion of these categories in 2023-2024 accounts for the bulk of the apparent increase in total Tamil Nadu agricultural demand from 24,034 MCM (2022-2023, without vegetables and fruits) to 33,894 MCM (2023-2024, with these categories included).

Tamil Nadu's agricultural water demand is structurally bifurcated. Delta districts are driven by paddy-intensive irrigation, while upland districts sustain a diversified but lower-intensity cropping system. This has direct planning implications: any reduction in delta paddy area or improvement in irrigation efficiency would yield the largest absolute savings in total agricultural water demand for the Tamil Nadu segment. Upland demand, though smaller in aggregate, is more variable across crop categories, making targeted intervention more complex. The simultaneous decline in pulse and cotton demand across multiple districts in 2023–2024 represents a recent structural shift that merits continued monitoring.

4.2 Agricultural water requirement for Karnataka

Karnataka's portion of the CRB supports the most agriculturally diverse cropping system in the basin, spanning cereals, millets, pulses, oilseeds, plantation crops, horticulture, sugarcane, and cotton. Agricultural water demand for the Karnataka districts has been estimated using crop-wise area and production data sourced from the Directorate of Economics and Statistics, Government of Karnataka, covering three reference years: 2019-2020, 2022-2023, and 2023-2024. Unlike Tamil Nadu's paddy-dominated delta, no single crop uniformly drives water demand here; instead, the dominant crop varies by district according to local conditions, altitude, rainfall, and irrigation access. The total agricultural water demand across the eleven Karnataka CRB districts amounts to 30,592 MCM in 2019-2020, 30,882 MCM in 2022-2023, and 25,426 MCM in 2023-2024. Figure 13 illustrates crop-wise demand for the three reference years.

Among individual districts, Tumakuru carries the heaviest agricultural water burden at 6,812 MCM in 2019-2020, driven overwhelmingly by coconut. Mandya follows at 5,320 MCM, shaped by the combined weight of paddy, coconut, and sugarcane, reflecting its unique position within the KRS canal command. Mysuru's total of 4,900 MCM and Hassan's 4,827 MCM place them in a comparable range, though their crop compositions differ. At the other end of the spectrum, Bengaluru Urban (373 MCM), Bengaluru Rural (698 MCM), and Kodagu (256 MCM) contribute modestly, a reflection of progressive agricultural land loss to urbanisation in the first two and of Kodagu's plantation-dominated economy.

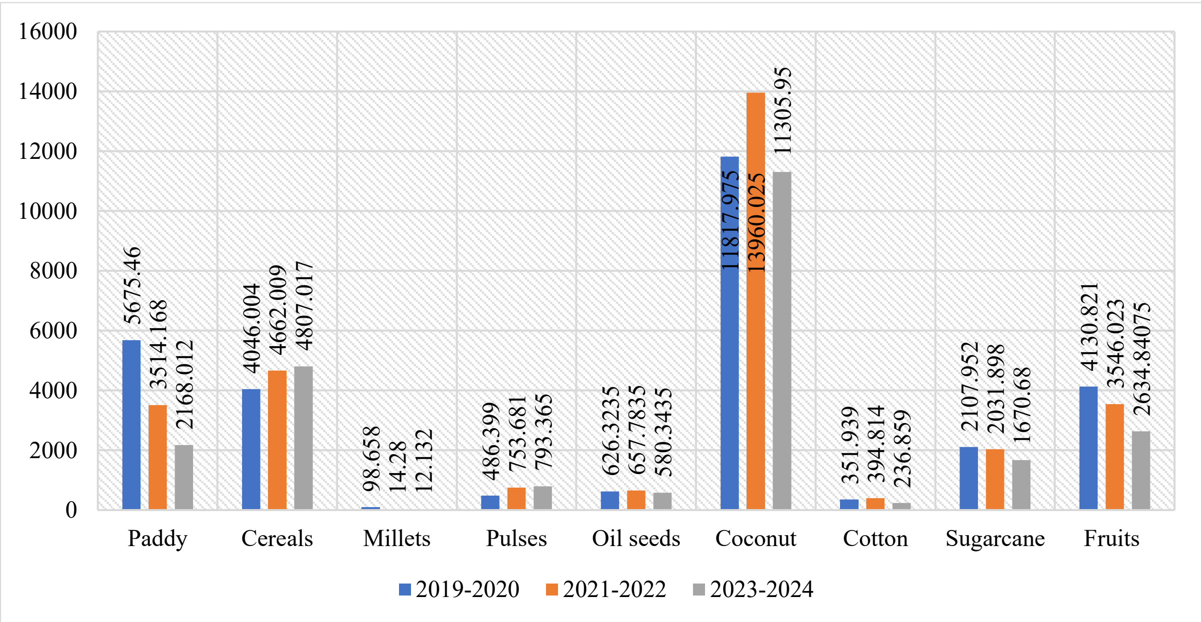

Figure 13: Crop-wise agricultural water demand in Karnataka : 2019–2020, 2021–2022, and 2023–2024 (MCM)

4.2.1 Paddy

Paddy in the Karnataka segment occupies a secondary position relative to coconut and cereals. Mysuru leads paddy demand at 2,343 MCM in 2019-2020, followed by Mandya at 1,866 MCM and Hassan at 895 MCM. Together these three districts, all partially served by the

Krishnaraja sagara canal command, account for the bulk of Karnataka's paddy irrigation. Chamarajanagar adds 240 MCM and Chikkamagaluru 106 MCM, while the remaining districts contribute marginal volumes: Bengaluru Rural at 5.5 MCM, Bengaluru Urban at 17 MCM, and Chikkaballapura at 14 MCM.

The defining trend in Karnataka's paddy data is a steep and sustained decline across nearly all districts over the study period. Mysuru's demand falls from 2,343 MCM to 1,377 MCM to 794 MCM, a reduction of 66 percent by 2023-2024. Mandya contracts from 1,866 MCM to 1,071 MCM to 553 MCM, and Hassan from 895 MCM to 465 MCM to 310 MCM. These reductions are too large and too widespread to be explained by seasonal variation alone; they point to a genuine contraction in paddy-cultivated area across the Karnataka plateau, whether driven by water scarcity, shifting crop economics, or policy-induced diversification. The sole exception is Kodagu, where paddy demand rises from 47 MCM to 188 MCM to 186 MCM, suggesting localised expansion coinciding with contraction elsewhere. Figure 16 confirms this trend spatially, with Mysuru and Mandya shifting from the darkest demand class in panel (a) to progressively lighter shading across panels (b) and (c).

4.2.2 Cereals

Cereal water demand is concentrated in four districts throughout the study period. In 2019-2020, Mysuru leads at 490 MCM, followed closely by Tumakuru (810 MCM), Hassan (876 MCM), and Mandya (249 MCM). The gap between this leading group and the remaining districts is considerable: Bengaluru Urban at 103 MCM represents less than 12 percent of Tumakuru's value.

A broad increase in cereal demand is evident by 2022-2023. Hassan emerges as the top cereal-demand district at 1,049 MCM, overtaking Tumakuru (848 MCM) and Mysuru (713 MCM). This upward shift persists into 2023-2024, with Hassan recording 1,082 MCM and Tumakuru 842 MCM. The persistence of high cereal demand in these districts confirms that cereal cultivation forms a well-established and water-intensive component of the agricultural system in the central Karnataka plateau. Figure 17 illustrates this concentration, with Tumakuru, Hassan, and Mysuru consistently occupying the highest demand classes while Tamil Nadu and Kerala districts remain in the lower categories.

4.2.3 Small Millets

Hassan stands out in millet cultivation. In 2019-2020, its small millet demand reaches 5.23 MCM, with Chikkaballapura (1.93 MCM), Tumakuru (75.42 MCM), and Mysuru (2.05 MCM) forming a secondary group. The difference in scale between these values and cereal or coconut demand is considerable; millets occupy a far smaller share of the irrigated area. From 2022-2023 onward, millet demand contracts across most districts. At the aggregate Karnataka level, Figure 13 reflects this trajectory: total millet demand falls from 98.66 MCM in 2019-2020 to 14.28 MCM in 2022-2023 and further to 12.13 MCM in 2023-2024. This decline is consistent with the broader Indian trend of millet area contraction, though recent policy initiatives promoting millets may alter this trajectory in coming years.

4.2.4 Pulses

Pulse cultivation spans several districts but concentrates most heavily in Mysuru, Chamarajanagar, and Tumakuru. Mysuru carries the largest pulse demand at 143 MCM in 2019-2020, with Chamarajanagar at 82 MCM and Tumakuru at 92 MCM. That Mysuru heads both cereal and pulse demand reflects the district's intensive and diversified agricultural profile, sustained by both canal and well irrigation within the KRS command area. By 2022-2023, pulse demand increases in both Tumakuru (179 MCM) and Mysuru (257 MCM), possibly driven by crop diversification efforts or favourable market conditions. This upward trend partially reverses in 2023-2024, with Mysuru at 224 MCM and Mandya registering a sharp increase to 174 MCM that was not evident in earlier years. The spatial distribution in Figure 18 shows Mysuru with the highest demand across all three panels, with Tumakuru's progression to a higher demand class in 2022-2023 visible in the map shading.

4.2.5 Oilseeds

Tumakuru dominates oilseed demand at 278 MCM in 2019-2020, followed by Chikkaballapura (142 MCM) and Chamarajanagar (141 MCM). This dominance mirrors Tumakuru's overall agricultural intensity and its near-complete dependence on well irrigation. The oilseed demand in Tumakuru rises further to 293 MCM in 2022-2023 and remains high at 281 MCM in 2023-2024, while Chamarajanagar declines to 93 MCM by the most recent year, suggesting different intensification trajectories across districts. Figure 21 supports this spatial concentration, with Tumakuru and Chikkaballapura occupying the highest demand classes among all basin districts.

4.2.6 Fruits and Horticultural Crops

Fruit crop demand in the Karnataka segment exhibits a distinctive temporal shift. In 2019-2020, Bengaluru Urban records the highest fruit demand at 112 MCM, a figure reflecting peri-urban horticulture within the metropolitan fringe. By 2022-2023, a marked redistribution has occurred: Ramanagara rises to 705 MCM and Bengaluru Rural to 230 MCM, while Tumakuru reaches 538 MCM. This outward displacement of horticultural cultivation from urban to peri-urban and rural districts is consistent with land use conversion in Bengaluru Urban and the concurrent growth of commercial horticulture in surrounding areas. By 2023-2024, the trend continues with Ramanagara at 637 MCM and Tumakuru at 495 MCM. The aggregate fruit demand across Karnataka amounts to 2,787 MCM in 2019-2020, 2,197 MCM in 2022-2023, and 1,916 MCM in 2023-2024.

4.2.7 Coconut

Coconut dominates the Karnataka segment's agricultural water demand as the single largest crop category, and its concentration in Tumakuru and Hassan gives these districts an agricultural water profile unlike any other in the basin. In 2019-2020, Tumakuru's coconut demand stands at 4,406 MCM, accounting for approximately 65 percent of the district's total demand of 6,812 MCM. At these proportions, coconut does not merely contribute to demand in Tumakuru; it determines it. Hassan's coconut demand of 2,635 MCM constitutes more than half of the district's 4,827 MCM total. Mandya ranks third at 1,570 MCM, though its share of district-level demand is moderated by the concurrent presence of paddy and sugarcane. By 2022-2023, coconut demand in Tumakuru rises to 5,613 MCM and in Hassan to 2,970 MCM, indicating continued intensification of plantation-based irrigation. The 2023-2024 values show some moderation: Tumakuru at 4,411 MCM and Hassan at 2,821 MCM. Nevertheless, coconut remains the dominant crop category in every reference year, recording a total Karnataka demand of 11,818 MCM in 2019-2020, 13,960 MCM in 2022-2023, and 11,306 MCM in 2023-2024. This means that coconut alone accounts for roughly 39 to 45 percent of total agricultural water demand across the entire Karnataka CRB segment. Any water-saving strategy targeting Karnataka's agricultural sector must therefore engage with coconut irrigation practices in these districts as a primary intervention point.

4.2.8 Sugarcane

Mandya's agricultural identity within the Karnataka basin is inseparable from sugarcane. In 2019-2020, its sugarcane demand of 1,349 MCM exceeds Mysuru's 369 MCM by a factor of nearly four, and Chamarajanagar's 246 MCM by more than five times. This concentration traces directly to the district's established canal irrigation from the KRS reservoir and the presence of sugar mills that have historically sustained large-scale cultivation. By 2022-2023, Mandya's sugarcane demand declines to 1,228 MCM while Mysuru's rises to 417 MCM, suggesting a partial redistribution of cane cultivation between the two districts. Figure 20 presents the spatial pattern, where Mandya's concentration is visually distinct from all other basin districts in every panel.

4.2.9 Cotton

Cotton contributes a smaller and generally declining share of agricultural water demand in the Karnataka basin. Mysuru records 255 MCM in 2019-2020, the highest among Karnataka districts, followed by Chamarajanagar at 71 MCM. By 2022-2023, Mysuru's cotton demand declines to 239 MCM, and further to 141 MCM in 2023-2024. Tumakuru records 53 MCM in 2022-2023, declining to 33 MCM. The downward trajectory is consistent across most districts and mirrors the broader basin-wide contraction in cotton cultivation noted in the Tamil Nadu segment. Figure 19 presents the spatial distribution, with progressively lighter shading across panels reflecting declining cultivation intensity.

4.2.10 Overall assessment agricultural water requirement for Karnataka

Coconut and cereals collectively dominate Karnataka's agricultural water demand. Coconut stands as the single largest demand driver, with Tumakuru, Hassan, and Mandya bearing the heaviest irrigation burdens. Sugarcane in Mandya and Mysuru adds a concentrated secondary pressure point. The key planning implication is that Tumakuru's total demand of 6,812 MCM in 2019-2020, of which 4,406 MCM derives from coconut alone, means that any strategy targeting agricultural demand reduction in the Karnataka segment must prioritise micro-irrigation adoption for coconut in this district and in Hassan. Districts like Bengaluru Urban, by contrast, show declining agricultural demand over time, a trend that will continue as urbanisation progressively reduces cultivable land.

The steep decline in paddy demand across Mysuru, Mandya, and Hassan, amounting to a 60 to 70 percent reduction between 2019-2020 and 2023-2024, represents a significant shift in cropping patterns within the KRS command area. Whether this reflects deliberate policy, farmer-driven crop switching, or water availability constraints warrants investigation, as the reduction has implications for both food production and water allocation within the interstate sharing framework.

4.3 Agricultural water requirement for Kerala

Three districts represent Kerala's portion of the CRB: Idukki, Palakkad, and Wayanad, each with a distinct agro-climatic and land use character. Agricultural water demand for these districts has been estimated using crop-wise area and production data sourced from the Directorate of Economics and Statistics, Government of Kerala, covering three reference years: 2019–2020, 2022–2023, and 2023–2024. The agricultural profile here differs from both Tamil Nadu's paddy-dominated delta and Karnataka's coconut-intensive plateau districts. Instead, Kerala's basin districts support a blend of plantation crops, fruits, cereals, and coconut cultivation, with demand patterns shaped by elevation, rainfall distribution, and the nature of the local farming economy.

Total agricultural water demand across the three Kerala districts is 10,953 MCM in 2019-2020, 10,774 MCM in 2022-2023, and 9,466 MCM in 2023-2024. Kerala's total agricultural demand is lower than those of Tamil Nadu (26,739 MCM in 2019-2020) and Karnataka (30,592 MCM), consistent with the smaller cultivated extent of the three highland districts. However, per-hectare water requirement norms for plantation crops (2,500 mm) and coconut (2,500 mm) are substantially higher than those for paddy (1,400 mm) or cereals (450 mm), which elevates absolute demand relative to the irrigated area. Figure 14 illustrates crop-wise demand for the three reference years.

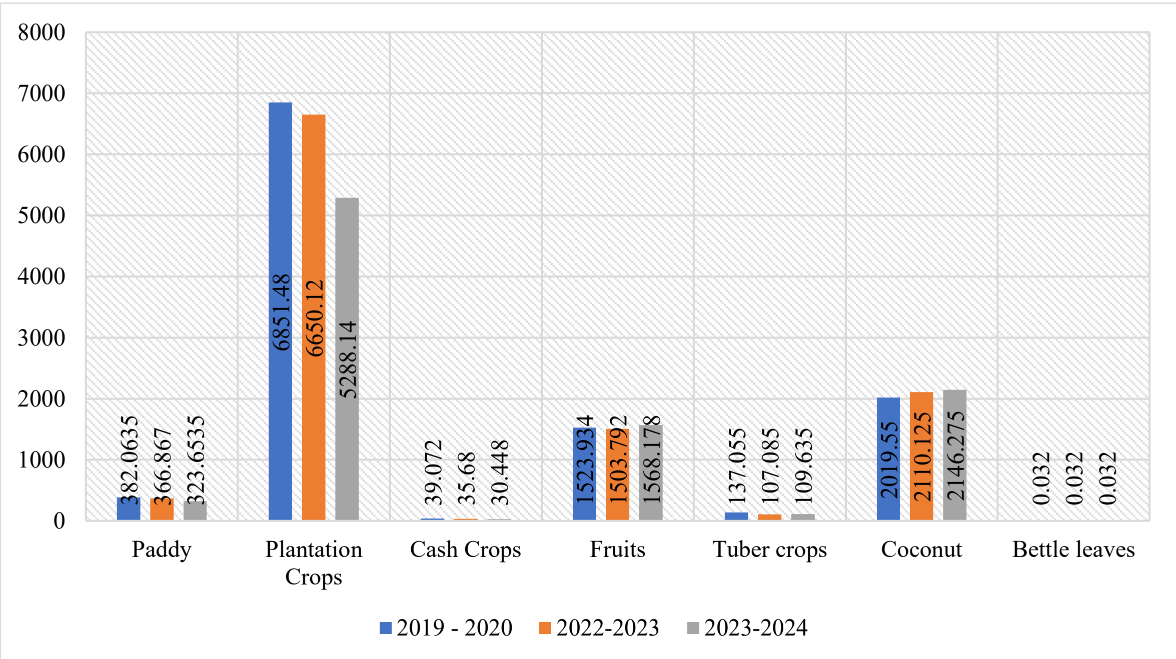

Figure 14: Crop-wise agricultural water demand in Kerala : 2019–2020, 2022–2023, and 2023–2024 (MCM)

4.3.1 Paddy

Paddy cultivation in Kerala's basin area is overwhelmingly concentrated in Palakkad. In 2019-2020, Palakkad accounts for 346 MCM of paddy demand against just 33 MCM in Wayanad and 2.8 MCM in Idukki. The ratio between Palakkad and Idukki, roughly 125:1, directly reflects the contrast between Palakkad's irrigated paddy plains and Idukki's highland terrain where paddy cultivation is nearly absent. By 2022-2023, Palakkad's demand declines marginally to 331 MCM while Wayanad edges up to 34.7 MCM and Idukki falls to 1.6 MCM, indicating broadly stable paddy area in Palakkad with minor fluctuations elsewhere. A more pronounced decline appears in 2023-2024: Palakkad drops to 290 MCM, Wayanad to 32 MCM, and Idukki to 1.5 MCM, suggesting contraction in cultivated paddy area across all three districts. Palakkad's reduction of approximately 56 MCM over the study period is a meaningful decline for a district that already faces competing demands from coconut and fruit cultivation. Figure 16 situates Palakkad within the broader basin paddy demand distribution.

4.3.2 Plantation Crops

Plantation crops constitute the dominant component of agricultural water demand within the Kerala segment. Idukki, with its extensive coffee, tea, rubber, and spice estates across the highland terrain, records the highest plantation demand at 3,406 MCM in 2019-2020, nearly three times Palakkad's 1,172 MCM and well above Wayanad's 2,273 MCM. The scale of these values reflects both the large area under plantation cultivation and the high per-hectare water requirement (2,500 mm) adopted for this category. In 2022-2023, Idukki's demand remains high at 3,248 MCM and Wayanad at 2,200 MCM, while Palakkad increases to 1,201 MCM. The most important temporal change in the Kerala dataset occurs in 2023-2024: Wayanad's plantation demand drops sharply to 846 MCM, a reduction exceeding 1,400 MCM from its 2019-2020 value.

Palakkad, by contrast, rises to 1,370 MCM. This divergence, with contraction in Wayanad occurring simultaneously with expansion in Palakkad, points to a redistribution in plantation cultivation intensity, possibly linked to post-flood land use changes in Wayanad or expansion of commercial plantations in the Palakkad Gap. Idukki also declines to 3,072 MCM but retains the top position across all three years. At the aggregate level, plantation crop demand amounts to 6,851 MCM in 2019-2020, 6,650 MCM in 2022-2023, and 5,288 MCM in 2023-2024, with the visible decline driven principally by contraction in Wayanad. Plantation crops alone account for 56 to 63 percent of total agricultural water demand in the Kerala segment.

4.3.3 Cash Crops

Cash crops contribute a comparatively minor share across all three districts. Wayanad records the highest cash crop demand in 2019-2020 at 19.5 MCM, exceeding both Idukki (10.8 MCM) and Palakkad (8.8 MCM). All three districts show declining trends through the study period: by 2023-2024, Wayanad reduces to 14.5 MCM, Idukki to 8.8 MCM, and Palakkad to 7.2 MCM. The aggregate values of 39 MCM, 35.7 MCM, and 30.4 MCM across the three reference years remain too small to affect the overall agricultural water balance within the Kerala segment.

4.3.4 Fruits

Fruit cultivation demand is more evenly distributed across the three districts than any other crop category in the Kerala segment. In 2019-2020, Palakkad records 558 MCM, closely followed by Idukki (502 MCM) and Wayanad (464 MCM). This relative balance, unlike the strongly skewed pattern in plantation crops, indicates that horticulture is broadly spread across elevation zones. Over time, however, Palakkad's fruit demand trends upward, reaching 614 MCM in 2022-2023 and 653 MCM in 2023-2024, while

Wayanad declines to 391 MCM by 2023-2024. Idukki holds relatively steady at 524 MCM in the most recent year. Palakkad's sustained upward trajectory adds incrementally to the district's already substantial irrigation burden, making it the primary future demand pressure point for horticultural water in the Kerala segment. Total fruit demand across the three districts remains relatively stable: 1,524 MCM, 1,504 MCM, and 1,568 MCM across the three reference years.

4.3.5 Tuber Crops

Among the major crop categories, tuber crops account for the smallest share of irrigation demand. Idukki leads at 85 MCM in 2019-2020, reflecting highland suitability for root and tuber cultivation, well above Palakkad (34 MCM) and Wayanad (18 MCM). A declining trend is evident across all districts between 2019-2020 and 2022-2023, with Idukki reducing to 74.8 MCM, Palakkad to 17 MCM, and Wayanad to 15.2 MCM. Partial recovery occurs in 2023-2024 in Palakkad (18.2 MCM) and Wayanad (21.8 MCM), while Idukki continues declining to 69.6 MCM, suggesting divergent cultivation trends between the highland and the plains districts.

4.3.6 Coconut

Coconut introduces a growing demand component in Palakkad that sets it apart from the other two Kerala districts. In 2019-2020, Palakkad's coconut demand of 1,436 MCM exceeds Idukki's 340 MCM by a factor of more than four and Wayanad's 244 MCM by nearly six times. This dominant position strengthens over the study period: Palakkad rises to 1,573 MCM in 2022-2023 and 1,610 MCM in 2023-2024, adding approximately 175 MCM over the full period. Idukki and Wayanad move in the opposite direction, with Idukki declining to 319 MCM and Wayanad to 217 MCM by 2023-2024.

This divergence reinforces the interpretation that Palakkad is undergoing an intensification of coconut cultivation, incrementally adding to its already heavy irrigation demand. Aggregate coconut demand rises from 2,020 MCM to 2,110 MCM to 2,146 MCM across the three years, making coconut the second-largest demand category after plantation crops in the Kerala segment.

4.3.7 Betel Leaves

Betel leaf cultivation contributes negligible irrigation demand: approximately 0.016 MCM each in Palakkad and Wayanad, totalling 0.032 MCM across all three years. This category has no measurable influence on the agricultural water balance.

4.3.8 Overall assessment agricultural water requirement for Kerala

Palakkad occupies a unique position within the Kerala segment. It is the only district where multiple high-demand crop categories, paddy, coconut, and fruits, simultaneously contribute large irrigation requirements, making it the most water-intensive agricultural district in Kerala's CRB area despite not carrying the highest plantation demand. Idukki, while leading in plantation and tuber crop demand, has a narrower agricultural base from an irrigation-intensity standpoint. Wayanad exhibits broadly declining trends across most crop categories between 2019-2020 and 2023-2024, most pronounced in plantation and fruit crops. Whether this reflects area contraction, changes in cultivation intensity, or the aftermath of the 2018-2019 flood events requires further investigation using local land use data. From a basin water planning perspective, Palakkad's increasing coconut and fruit demand trajectory, combined with its large paddy and cereal base, positions it as the primary future agricultural demand pressure point within the Kerala segment of the CRB.

4.4 Puducherry (Karaikal)

Karaikal forms part of the lower Cauvery delta agricultural system and has the simplest, most concentrated crop-water demand profile among all four states in the basin. Agricultural water demand for Karaikal has been estimated using crop-wise area and production data sourced from the Directorate of Economics and Statistics, Government of Puducherry, covering three reference years: 2019-2020, 2022-2023, and 2023-2024. The region's agriculture is almost entirely paddy-based, with all other crop categories contributing marginal volumes. Figure 15 illustrates crop-wise demand for the three reference years.

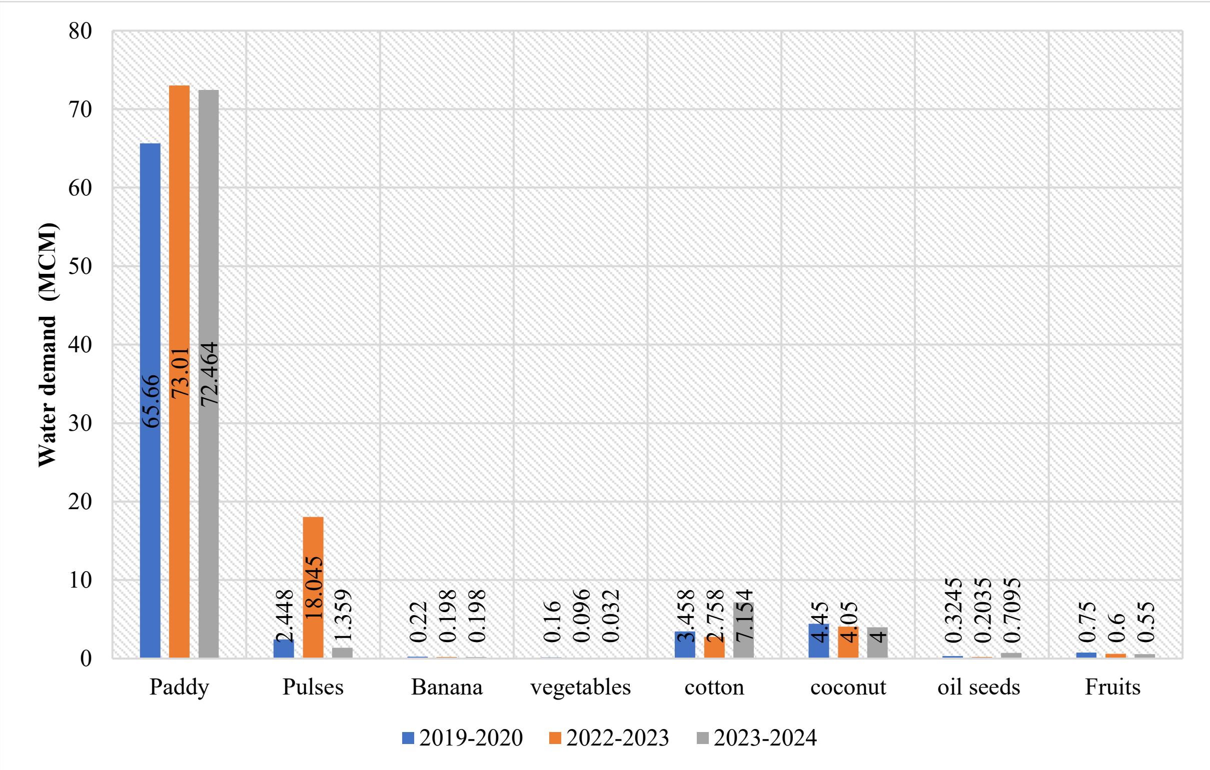

Figure 15: Crop-wise agricultural water demand in Karaikal : 2019–2020, 2022–2023, and 2023–2024 (MCM)

4.4.1 Paddy

Paddy demand in Karaikal stands at 65.66 MCM in 2019-2020, rising to 73.01 MCM in 2022-2023 before settling marginally to 72.46 MCM in 2023-2024. The 7.35 MCM increase between the first two reference years suggests either expanded irrigated area or higher seasonal intensity, while the slight pullback in 2023-2024 appears to reflect stabilisation. Within the broader basin context, Karaikal falls in the lower paddy demand classes in Figure 16 , reflecting its small geographical extent rather than low cultivation intensity. As a delta region entirely dependent on distributary canal flows from the Cauvery system, any shortfall in upstream releases directly affects paddy irrigation here.

4.4.2 Pulses

Pulse demand in Karaikal displays the most volatile temporal pattern of any crop category in the region. Starting at 2.45 MCM in 2019-2020, it rises to 18.05 MCM in 2022-2023 before collapsing to 1.36 MCM in 2023-2024. This sevenfold increase followed by a near-complete reversal indicates that pulse cultivation is not a stable component of Karaikal's agricultural system but rather a seasonally variable activity, likely linked to paddy-pulse rotation decisions and annual land allocation choices. Figure 18 situates Karaikal within the basin-wide pulse demand distribution, where the region's small geographical extent limits its visual prominence, but the temporal instability is evident across the three panels.

4.4.3 Cotton

Cotton demand follows a pattern opposite to pulses. It declines from 3.46 MCM in 2019-2020 to 2.76 MCM in 2022-2023, then more than doubles to 7.15 MCM in 2023-2024. This sharp increase in the most recent year, against a backdrop of preceding decline, indicates a significant expansion in cotton cultivation area, making it the second-largest water-demanding crop in Karaikal for 2023-2024 after paddy.

4.4.4 Coconut

Coconut contributes a moderate and slightly declining share of agricultural demand: 4.45 MCM in 2019-2020, 4.05 MCM in 2022-2023, and 4.00 MCM in 2023-2024. The stability of these values indicates that coconut is a persistent but limited component of Karaikal's agricultural system, with no significant change in either direction over the study period.

4.4.5 Minor Crops

Banana (declining from 0.22 MCM to 0.20 MCM), vegetables (1.60 MCM to 0.03 MCM in 2023-2024, a near-complete collapse), fruits excluding banana (0.75 MCM to 0.55 MCM), and oilseeds excluding coconut (0.32 MCM to 0.71 MCM) collectively account for a negligible share of total demand. The vegetable decline is particularly sharp and warrants verification against source data. The oilseed increases from 0.20 MCM in 2022-2023 to 0.71 MCM in 2023-2024 may reflect an opportunistic shift in land use.

4.4.6 Overall assessment agricultural water requirement for Karaikal

Karaikal is the most uniform agricultural district in the entire basin, with paddy irrigation almost entirely determining total water demand. The total agricultural water demand amounts to 77.47 MCM in 2019-2020, 98.96 MCM in 2022-2023 (inflated by the pulse surge), and 86.47 MCM in 2023-2024. The region's delta location and dependence on canal-delivered Cauvery water mean that fluctuations in paddy demand translate directly into fluctuations in total irrigation withdrawal from the distributary system. The sharp year-to-year volatility in pulse and cotton demand signals that non-paddy cultivation responds to short-term incentives or seasonal conditions rather than representing planned, stable irrigation allocation.

4.5 Whole CRB - Integrated Agricultural Demand

The crop-wise assessment across all four states reveals that the CRB does not have a single uniform agricultural water demand pattern but instead comprises three spatially distinct demand regimes, each reflecting the hydrological and agro-climatic conditions of its geography. The first is the delta regime, comprising Thanjavur, Thiruvarur, Cuddalore, Nagapattinam-Mayiladuthurai, and Karaikal. This zone is paddy-dominated and canal-dependent, with paddy demand in Thanjavur alone exceeding 3,000 MCM in peak years. The viability of delta agriculture is tied directly to reservoir releases and canal system operability; any sustained reduction in upstream flows affects the entire downstream cropping system. The second is the Karnataka plateau regime, encompassing Tumakuru, Hassan, Mandya, and Mysuru. This zone is coconut and cereal-dominated, with sugarcane providing a concentrated secondary demand in Mandya. Tumakuru's total demand of 6,812 MCM in 2019-2020, of which 4,406 MCM derives from coconut, makes it the single highest agricultural water demand district among the Karnataka CRB districts. Coconut cultivation, with its perennial water requirement and high per-hectare demand (2,500 mm), presents a fundamentally different planning challenge from seasonal paddy: irrigation demand is year-round rather than monsoon-aligned, and the crop cannot be fallowed in drought years without permanent loss. This makes the coconut-intensive districts of Karnataka particularly vulnerable to sustained groundwater decline.

The third is the highland and transitional regime, comprising Palakkad, Idukki, and Wayanad in Kerala alongside upland Tamil Nadu districts such as Salem, Namakkal, and Krishnagiri. Agricultural demand here is driven by plantation crops (especially in Idukki and Wayanad), coconut (in Palakkad), and a mix of cereals, pulses, oilseeds, and horticultural crops in the Tamil Nadu uplands. Total demand is generally lower per district than in the delta or plateau zones, though the per-hectare water requirements for plantation crops and coconut are among the highest in the basin. At the basin level, coconut cultivation in Karnataka, paddy cultivation in the Tamil Nadu delta, and the combination of plantation crops and coconut in Palakkad collectively account for the largest shares of total agricultural water demand. The spatial maps presented in Figure 16 to Figure 21 confirm these three distinct regimes across all reference years.

Methodological Notes on Agricultural Water Demand Data Compilation and Map Classification

The spatial distribution maps presented in Figure 16 to Figure 21 are developed based on crop-wise agricultural water demand data compiled from individual State Government statistical reports and official websites for three reference years 2019–2020, 2022–2023, and 2023–2024. Readers are advised to consider the following data limitations while interpreting these figures. The crop categories included in the agricultural water demand estimation vary across the three reference years due to differences in data availability and reporting practices among states. Consequently, the total agricultural water demand values for 2019–2020, 2022–2023, and 2023–2024 are not directly comparable. Therefore, comparisons have been made only for those crop categories that are consistently reported across all three years, wherever applicable. It is observed that the Kerala districts Idukki, Palakkad, and Wayanad record zero values for categories such as Cereals, Pulses, Sugar Crops, Vegetables, Fibre Crops, and Oilseeds. These zero values arise due to differences in crop classification frameworks between Kerala's state-level data sources and the standardized crop categories adopted in this study. Hence, these values do not indicate the absence of agricultural water demand but rather reflect classification non-uniformity. Similarly, for Tamil Nadu districts, Vegetables and Fruits categories show zero values for the year 2022–2023, due to the non-availability of reported data for that period. Further, the values reported for Nilgiris district in 2019–2020 for certain crop categories appear inconsistent with the district's known land use characteristics, which are predominantly plantation-based. These values have been retained as reported, pending verification from source data. All spatial maps have been classified using the manual breaks method, applied to the combined range of values across all three reference years, to ensure consistency in the colour scale and enable meaningful visual comparison across map panels.

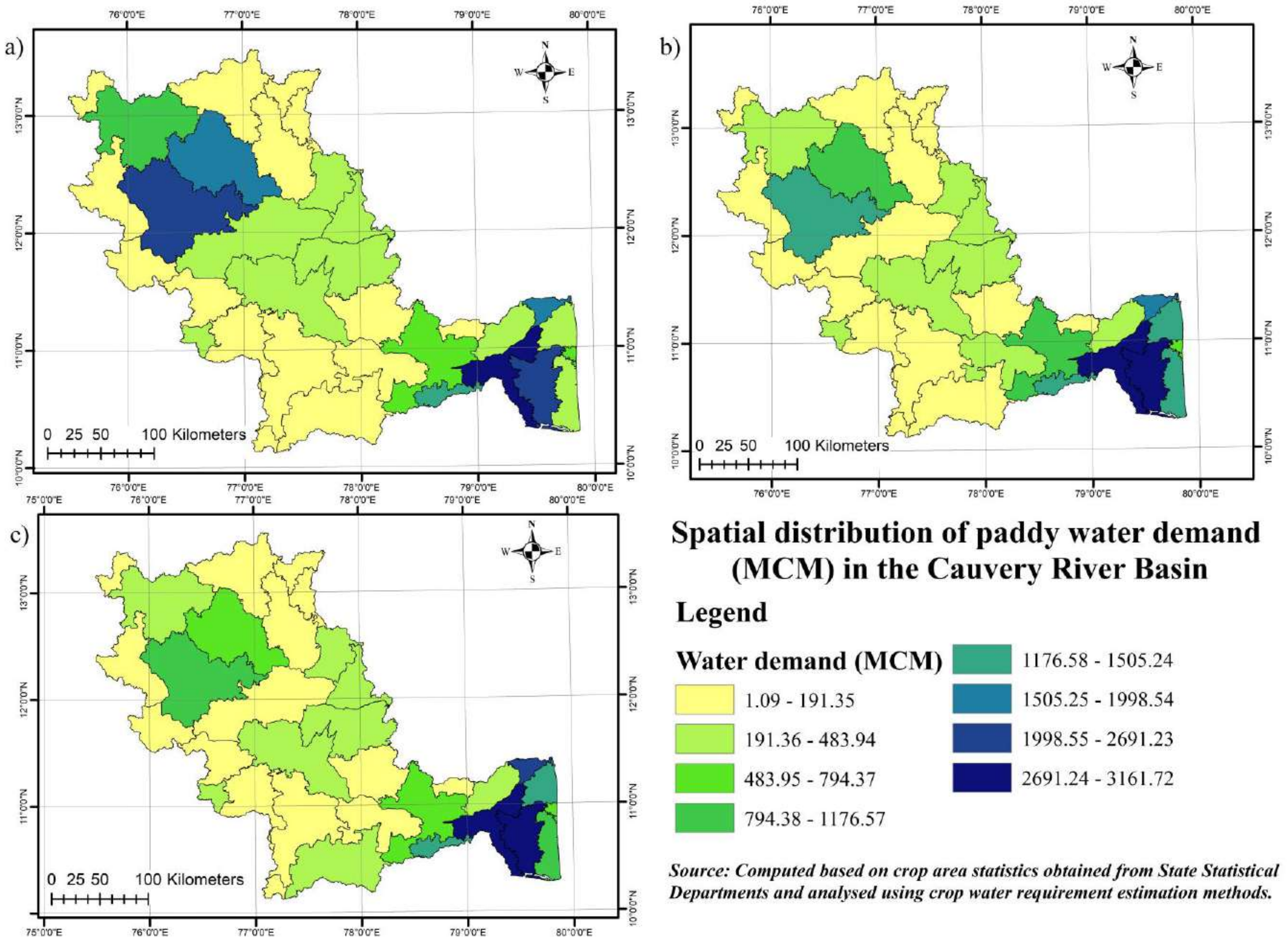

Figure 16: Spatial distribution of paddy water demand in the Cauvery River Basin : (a) 2019–2020, (b) 2022–2023, & (c) 2023–2024 (MCM)

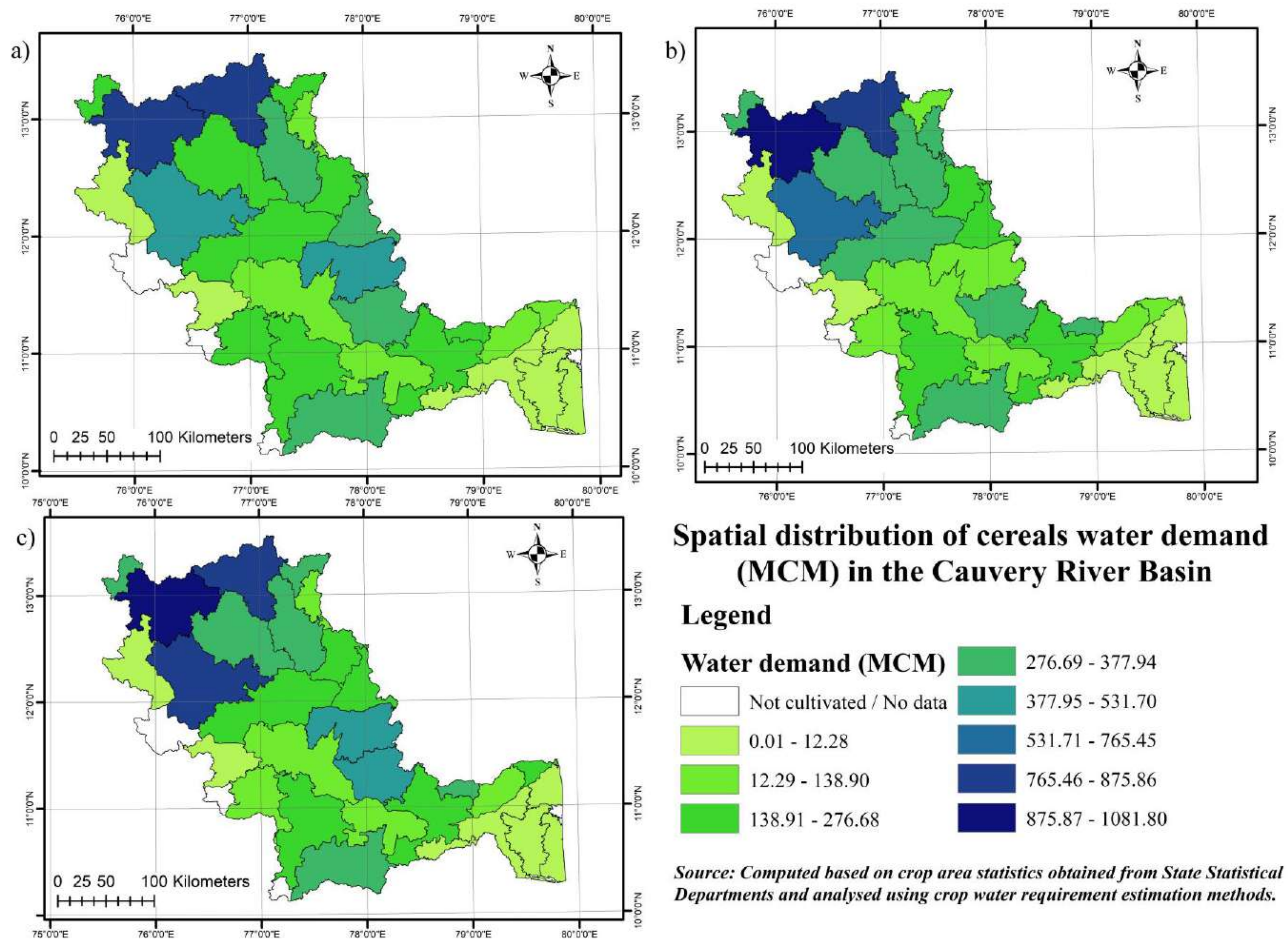

Figure 17: Spatial distribution of cereals water demand in the Cauvery River Basin (a) 2019–2020, (b) 2022–2023, & (c) 2023–2024 (MCM)

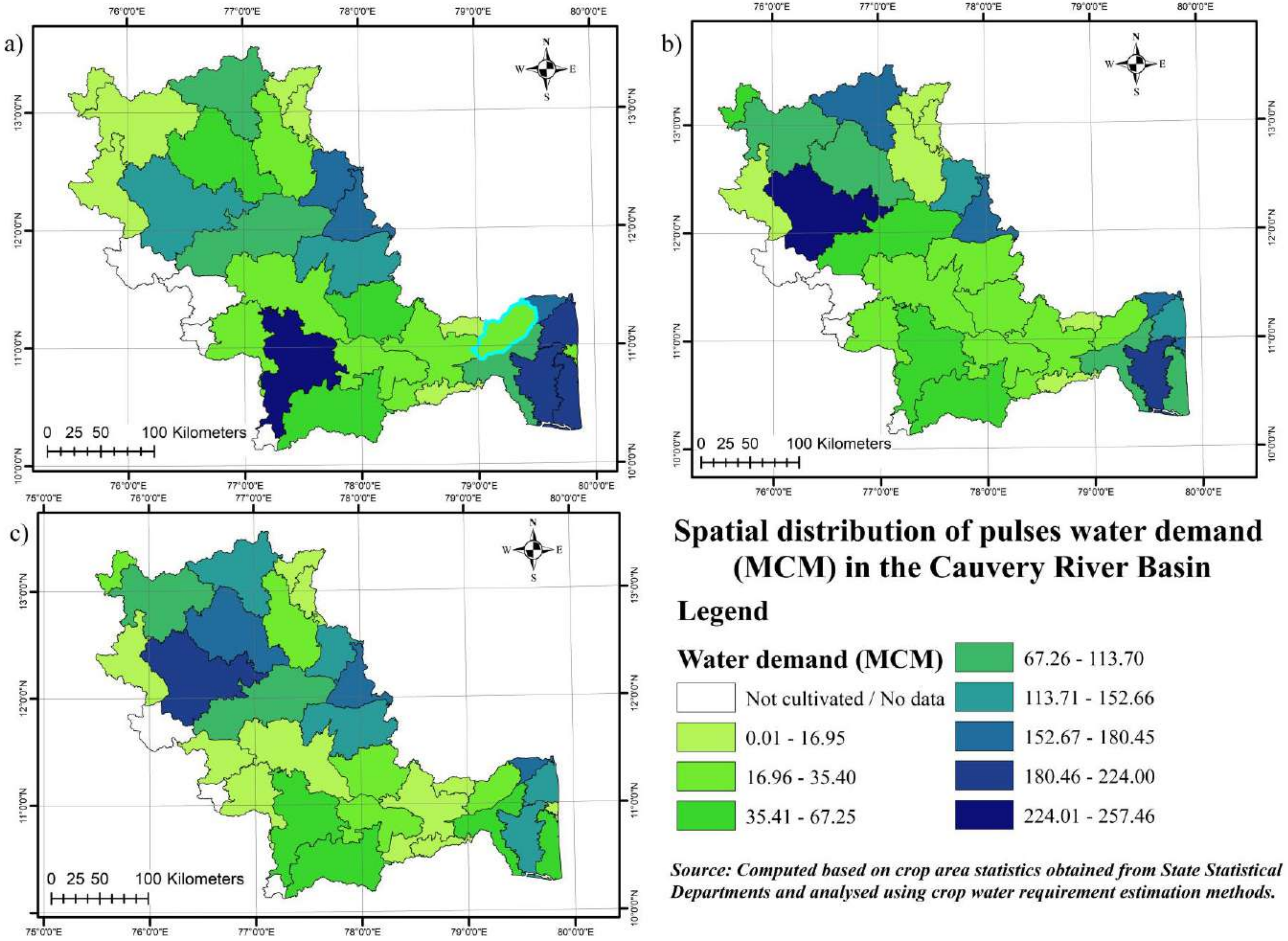

Figure 18: Spatial distribution of pulses water demand in the Cauvery River Basin (a) 2019–2020, (b) 2022–2023, & (c) 2023–2024 (MCM)

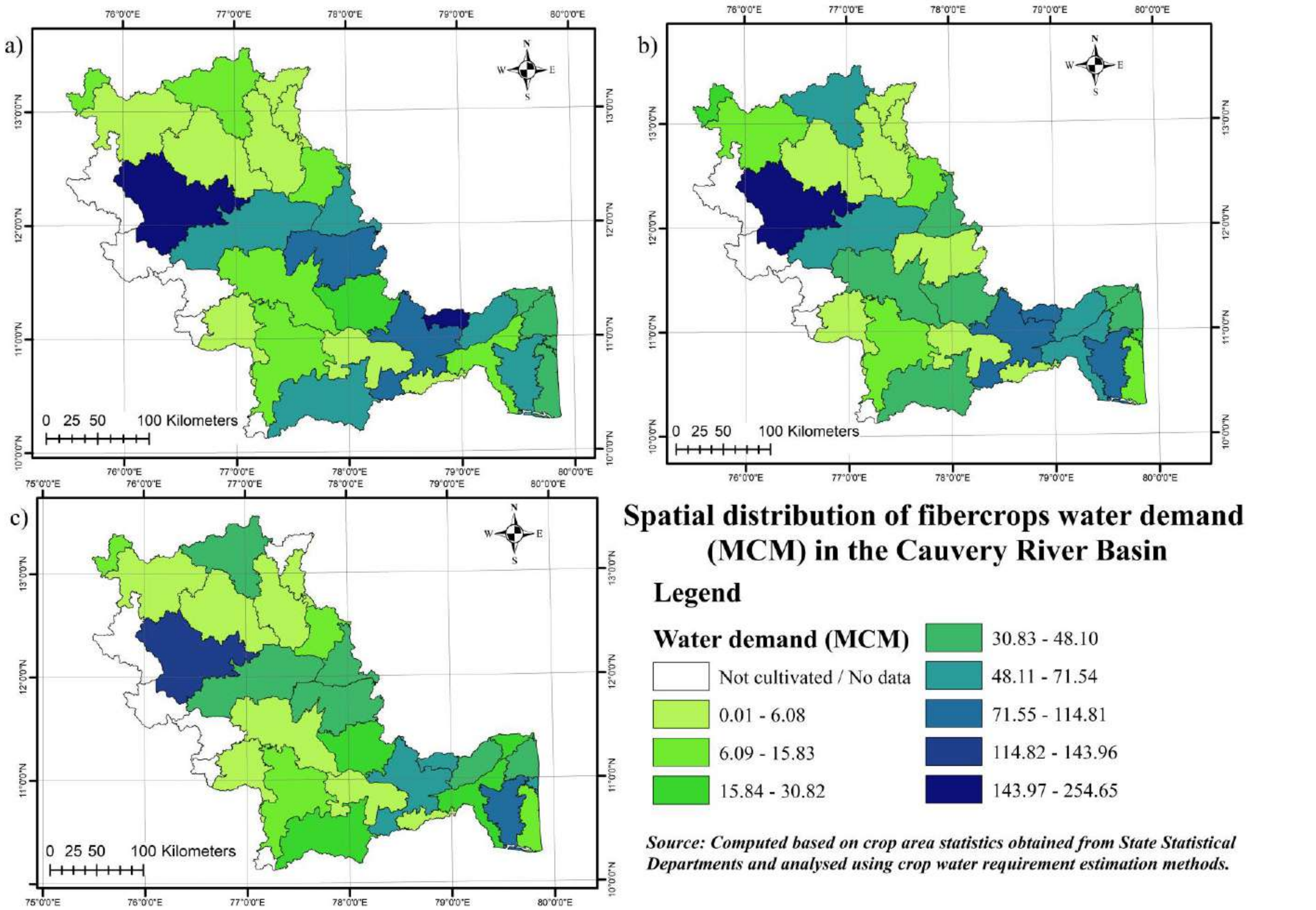

Figure 19: Spatial distribution of fibre crops water demand in the Cauvery River Basin (a) 2019–2020, (b) 2022–2023, & (c) 2023–2024 (MCM)

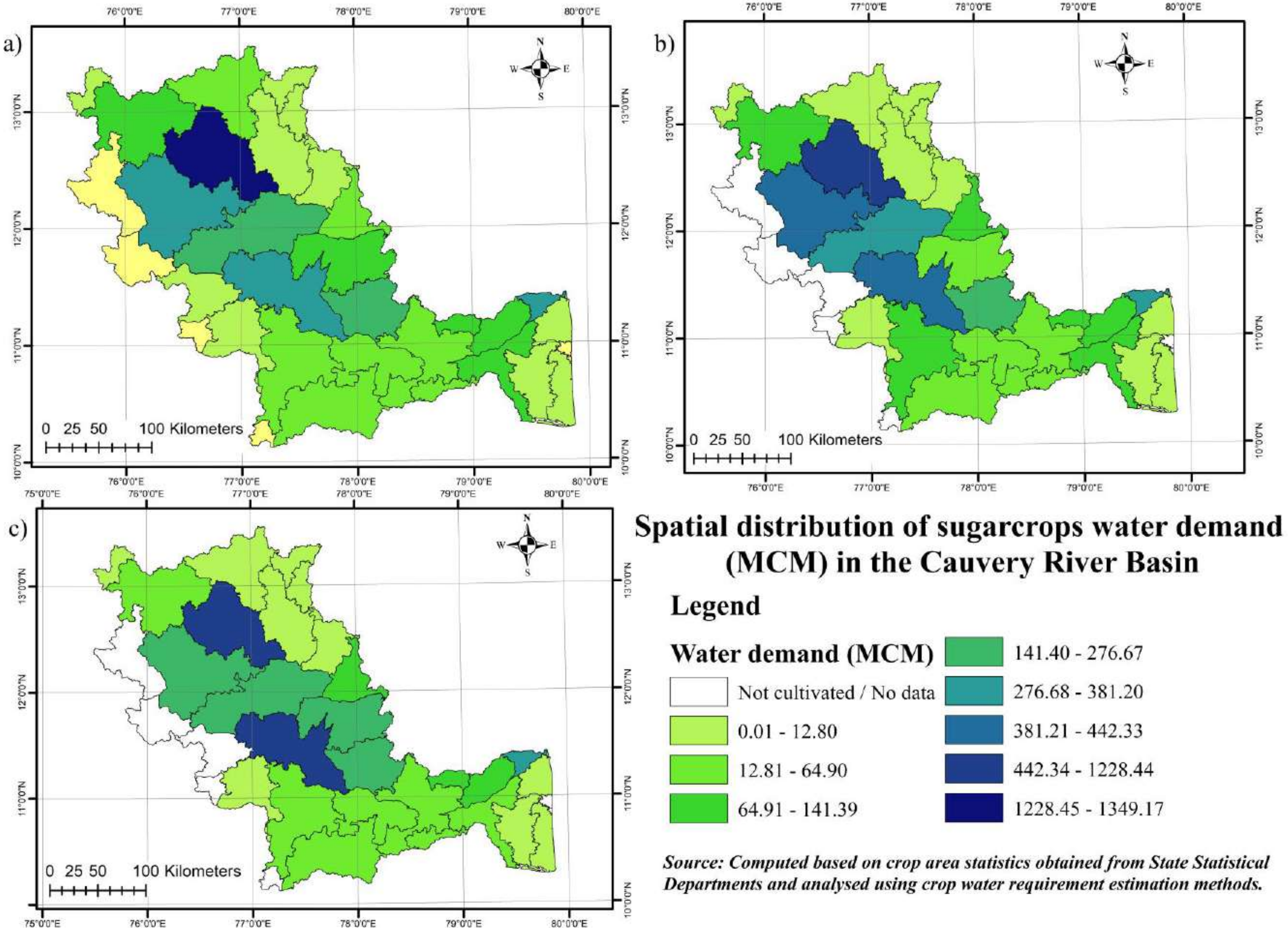

Figure 20: Spatial distribution of sugar crops water demand in the Cauvery River Basin (a) 2019–2020, (b) 2022–2023, & (c) 2023–2024 (MCM)

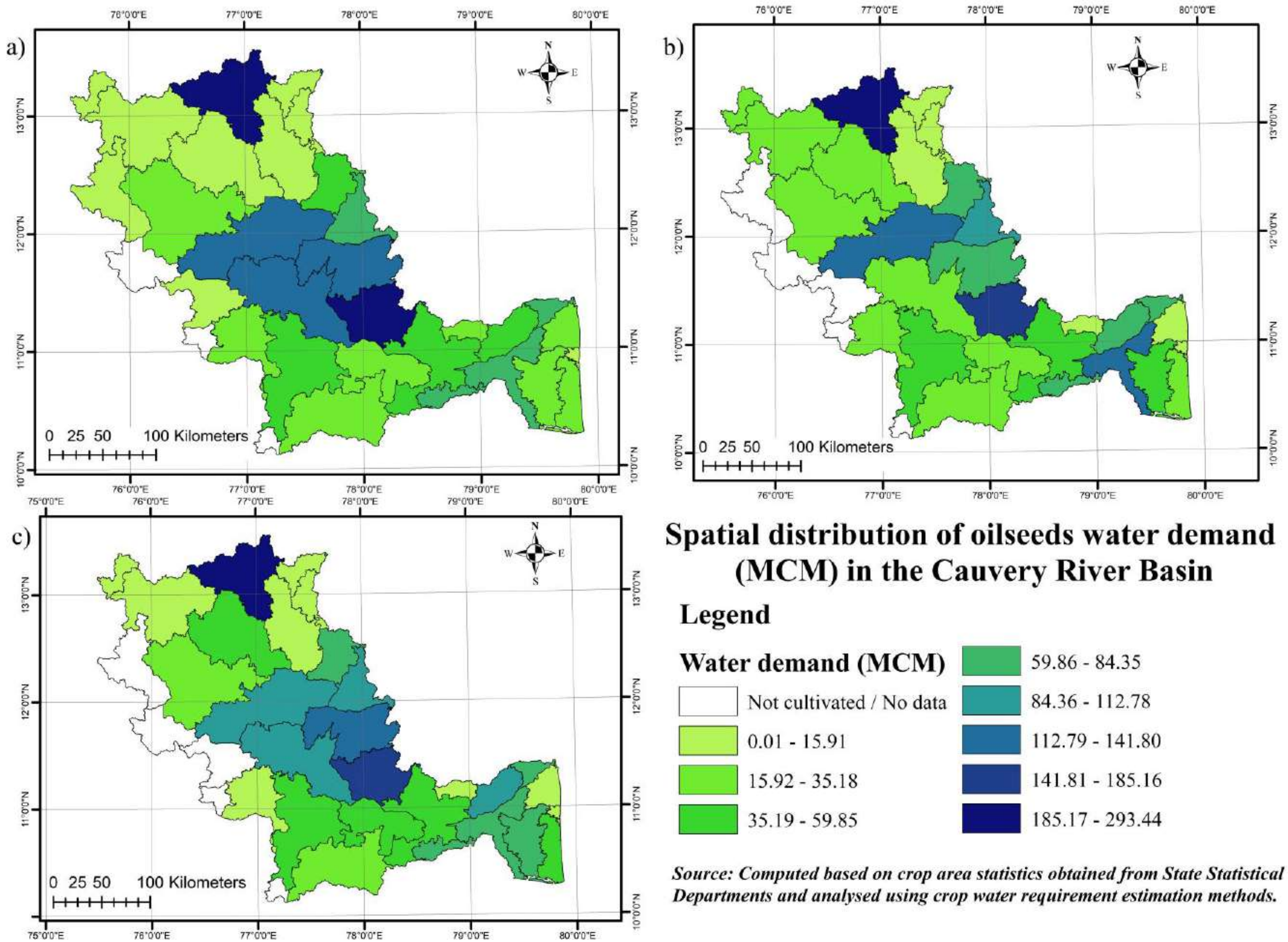

Figure 21: Spatial distribution of oilseeds water demand in the Cauvery River Basin (a) 2019–2020, (b) 2022–2023, & (c) 2023–2024 (MCM)

5. WATER SUPPLY

According to the SDG goal 6 accessing of safe and adequate drinking water is required, which targets universal availability and sustainable management of water and sanitation. Across the CRB districts of Tamil Nadu, domestic water supply draws on a combination of surface water abstraction from the Cauvery River and localized groundwater sources.

This assessment evaluates two components: the designed Cauvery-based surface water abstraction capacity for drinking purposes, and projected domestic water demand (urban and rural) for 2011 & 2025. The supply dataset represents designed abstraction capacity (MLD converted to MCM/year) and does not account for groundwater-based systems or other non-Cauvery sources. The analysis therefore reflects dependency on Cauvery surface water specifically, not total water availability.

5.1 Domestic water supply capacity in Tamil Nadu

Total designed Cauvery-based drinking water abstraction capacity across the Tamil Nadu CRB districts is approximately 550 MCM. These surface water sources, supplemented by groundwater infrastructure in inland and upland districts, collectively underpin both irrigation supply and domestic water distribution in the region, sustaining paddy cultivation in the deltaic areas and municipal supply in major urban centres.

Table 11: District-wise designed Cauvery surface water abstraction capacity Tamil Nadu CRB Districts (MCM)

Districts	Water Supply in MCM
Salem	200.79
Karur	115.27
Tiruchirappalli	69.7
Thanjavur	60.37
Dharmapuri	58.37
Erode	54.94
Namakkal	36.45
Nagapattinam	13.68
Perambalur	5.91
Ariyalur	4.16

Here, Table 11 presents the designed Cauvery river-based abstraction capacity for the ten Tamil Nadu districts present in the CRB compiled from district-level water supply records obtained from the Tamil Nadu Water Supply and Drainage Board (TWAD Board). Designed abstraction capacity data for the remaining nine Tamil Nadu CRB districts Coimbatore, Cuddalore, Dindigul, Krishnagiri, Nagapattinam, Pudukkottai, Nilgiris, Thiruvarur, and Tiruppur were not available from the data sources compiled for the present assessment. The domestic supply comparison in Table 12 is restricted to the ten districts listed above, and the supply status of the remaining nine districts cannot be evaluated within the scope of the observation. This represents a data limitation that should be addressed in future assessments through compilation of district-level water supply records from the TWAD and relevant local bodies.

Among the available districts, Salem, Karur, and Tiruchirappalli are the major districts draws water through major abstraction centres, together accounting for a significant share of total designed withdrawal capacity within the Tamil Nadu segment. When projected domestic demand is compared against designed surface abstraction capacity Table 12,the level of dependency on the river water caries considerably. The districts Salem and Karur appear to have sufficient designed capacity to meet the projected 2025 domestic water demand, while the districts like Thanjavur, Tiruchirappalli, and Erode depicts a high dependence on the Cauvery river based supply systems, reflecting differences in local water availability, groundwater dependence, and the presence of combined water supply schemes serving individual districts.

Domestic demand and surface supply comparison for the year 2025

The comparison between projected domestic water demand and designed Cauvery-based abstraction capacity for the year 2025, presented in Table 12, provides an indication of the extent to which surface water infrastructure can support domestic water requirements in the Cauvery basin districts of Tamil Nadu.

Table 12: Domestic water demand vs Designed Cauvery surface supply Tamil Nadu CRB districts (2025)

District	Total Domestic Demand 2025 (MCM)	Designed Cauvery Supply (MCM)	Surface Supply Share (%)	Interpretation
Salem	152.76	200.79	>100%	Designed supply exceeds projected demand
Karur	41.75	115.27	>100%	Significant surplus capacity
Dharmapuri	47.40	58.37	~123%	Adequate surface capacity
Thanjavur	83.82	60.37	72%	High dependency
Tiruchirappalli	113.50	69.70	61%	Moderate to high dependency
Erode	94.67	54.94	58%	Moderate dependency
Namakkal	68.92	36.45	53%	Moderate dependency

Nagapattinam	49.11	13.68	28%	Limited surface dependency
Perambalur	17.36	5.91	34%	Partial dependency; groundwater-supported
Ariyalur	19.91	4.16	21%	Non-Cauvery sources / groundwater dependence

The demand – supply gap from the observed values shows a sharp difference across the districts, providing a inequality of water availability. The districts Salem and Karur maintains a designed capacities exceeding the projected 2025 demand by factors of 1.3 and 2.8, while the Dharmapuri's designed capacity of 58.37 MCM similarly exceeds its projected demand if 47.40 MCM. At the other end, Ariyalur's designed Cauvery supply of 4.16 MCM covers only 21% i.e. 13.68 MCM against 49.11 MCM, and Perambalur district also follows the same pattern. These structural deficits cannot be addressed through Cauvery surface water alone and require supplementary groundwater or inter-source augmentation.

Between these extremes lies a group of districts with moderate to high dependency on Cauvery-based systems. Thanjavur receives approximately 60.37 MCM through Cauvery abstraction against a projected demand of 83.82 MCM (roughly 72 percent), Tiruchirappalli relies on 69.70 MCM against 113.50 MCM (about 61 percent), Erode's designed capacity of 54.94 MCM covers approximately 58 percent of its 94.67 MCM demand, and Namakkal receives 36.45 MCM against 68.92 MCM (53 percent). In districts such as Nagapattinam, where surface abstraction supports only about 28 percent of projected demand, the balance is necessarily met through groundwater or alternative local sources. In total for the year 2025 comparison confirms that while Cauvery based surface water infrastructure provides a great support to the domestic supply in several districts, the level of dependency may vary, where some have surplus of abstraction capacity and others relying heavily on a combination of surface and groundwater sources to meet the current water demands.

5.2 Domestic water Supply Assessment in Karnataka (excluding Bengaluru City)

The Karnataka portion of the CRB contains several urban settlements supplied through Cauvery-based bulk water transfer schemes operated by the Karnataka Urban Water Supply and Drainage Board (KUWSDB). The towns served under these schemes represent a distributed urban demand structure that collectively contributes to the overall domestic water requirement of the basin. For the design-year June 2025 to May 2026, the total projected domestic water requirement for KUWSDB towns within the basin is estimated at 1,017,200 ML, which is equivalent to approximately 1,017 MCM or 35.91 TMC. This value represents the aggregated annual water requirement designed to support the domestic supply systems of these urban settlements. However, as per KUWSDB records for the current design year water drawl during the same reporting period is approximately 3.225 TMC, corresponding to about 91.3 MCM. When compared with the projected requirement of 35.91 TMC, the recorded drawl represents only about 9% of the projected annual requirement. This discrepancy indicates that the reported abstraction values likely represent regulated releases or partial accounting of operational supply within the reporting period rather than the total annual withdrawal from all supply sources.

The difference here between the projected requirement and recorded drawl suggest that many towns within the Karnataka segments rely on supplementary water sources, including a local surface storage system, and also groundwater abstraction, to meet the part of their domestic requirements. Although the water demand of individual towns may at moderate level, the aggregated requirement of approximately 36 TMC per year represents a major component of Karnataka's total Cauvery water dependency. The separation of Bengaluru city from this assessment is important because the metropolitan water supply system represents a distinct and significantly larger demand centre managed by a separate institutional authority (BWSSB). By isolating KUWSDB towns from the Bengaluru metropolitan supply system, the analysis provides a clearer understanding of the distributed urban demand pattern within the Karnataka segment, indicating that non-metropolitan urban settlements collectively contribute a substantial share of domestic water demand while simultaneously relying on a combination of Cauvery surface water transfers and local supplementary sources.

5.3 Bengaluru city water supply - (BWSSB)

Bengaluru represents the largest single urban demand centre within the CRB. The water supply system, managed by the Bengaluru Water Supply and Sewerage Board (BWSSB), currently supplies water to approximately 12.9 million people within the Bruhat Bengaluru Mahanagara Palike (BBMP) region, delivering about 1,450 MLD of Cauvery water equivalent to roughly 529.25 MCM per year. The key components of the supply infrastructure, summarized in Table 13, include approximately 10.15 lakh house service connections, a pipeline network of 8,746 km, 57 ground-level reservoirs with a combined storage capacity of about 885 ML, thirty-six overhead tanks providing an additional 33 ML, and sixty-two booster pumping stations maintaining pressure across the metropolitan distribution network.

Table 13: Bengaluru Metropolitan Water Supply Infrastructure: key water supply parameters (Source: BWSSB)

Present supply from Cauvery source	1450MLD
Present Population served combined in one hundred Villages	12.9 million
Area of Water supply served & population	575 sq. kms & 10 lakhs
House service connection	10.15 lakhs
Total length of water supply pipelines	8746 kms
Range of Pipe diameters	100 to 1800 mm
Number of Ground Level Reservoirs	57 (885 ML)

Number of Over Head Tanks	36 (33 ML)
Booster pumping stations	62 nos.
Water tanker lorries	68 nos.
Quantity of water supplied/month	42,200 ML
Average per capita consumption	108 LPCD

It is noted that the average per capita consumption in Bengaluru of 108 LPCD, as recorded in Table 13, is lower than the design norm of 135 LPCD adopted for demand estimation in this study. This gap of 27 LPCD between designed supply standards and actual delivered consumption is attributable to distribution losses, intermittent supply, and demand management, and the projections in Table 4 based on the 135 LPCD norm therefore represent design-level requirements rather than observed consumption levels. Historically, Bengaluru relied on local sources such as lakes, tanks, wells, and the Arkavathi River system, but declining storage levels in reservoirs such as Hesaraghatta and Thippagondanahalli significantly reduced their reliability, shifting the city towards dependence on Cauvery River water transfers as the primary source of metropolitan supply.

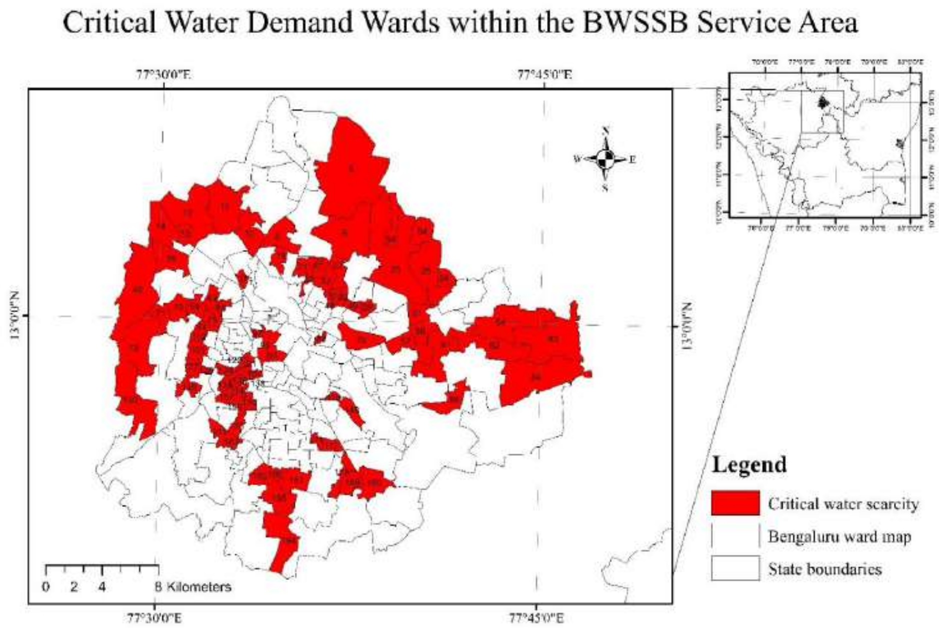

Figure 22: Spatial distribution of critical water demand wards in Bengaluru (Source: IISc report – 2025)

The above figure illustrates the spatial distribution of wards identified as critical demand zones within the BWSSB service area. Many of these wards are located along peripheral growth corridors and densely populated zones where rapid urban expansion has outpaced supply infrastructure. The spatial pattern indicates that despite bulk Cauvery supply through CWSS, intra-city variations in demand and infrastructure distribution create localized water stress, highlighting the need for prioritized infrastructure upgrades, distribution network improvements, and demand management in these wards.

The Government of Karnataka initially allocated 19 TMC of Cauvery water for Bengaluru's drinking water requirements, fully utilized following commissioning of Cauvery Water Supply Scheme (CWSS) Stage IV Phase II. An additional 10 TMC allocation was subsequently approved, bringing the total to 29 TMC, with the proposed CWSS Stage V project (775 MLD comprising Phase I at 500 MLD and Phase II at 275 MLD) intended to operationalize this additional allocation and further augment the city's Cauvery-based supply capacity. From a basin-level perspective, Bengaluru’s water supply system represents the largest metropolitan abstraction system within the Karnataka segment of the CRB. The scale of the system is particularly notable because water must be pumped over an elevation of more than 100 metres and conveyed over a distance of approximately 86 km, making it one of the most energy-intensive urban water supply systems in India.

5.4 Domestic water supply in Puducherry (Karaikal)

The Karaikal region is a part of the fertile Cauvery delta, which is hydrologically sustained by the distributary network of the Cauvery River downstream of the Grand Anicut. The main distributary river influencing the region include the Kodamurutti, Arasalar, Veeracholanar, and Vikramanar, with the Arasalar and its river branches which play a significant role in the Karaikal. The region is extensively traversed by multiple branches and sub-branches of the Cauvery system, making surface water the principal source of irrigation and domestic water availability, with canals contributing 92 percent and tubewells accounting for 8 percent of total water availability (Figure 23). The Arasalar river extends approximately 24 km within the region and is fed by three tributary branches: the Nattar (12.60 km), the Vanjiar (9 km), and the Noolar (16.62 km), with the Noolar joining the Vanjiar south-west of Karaikal town.

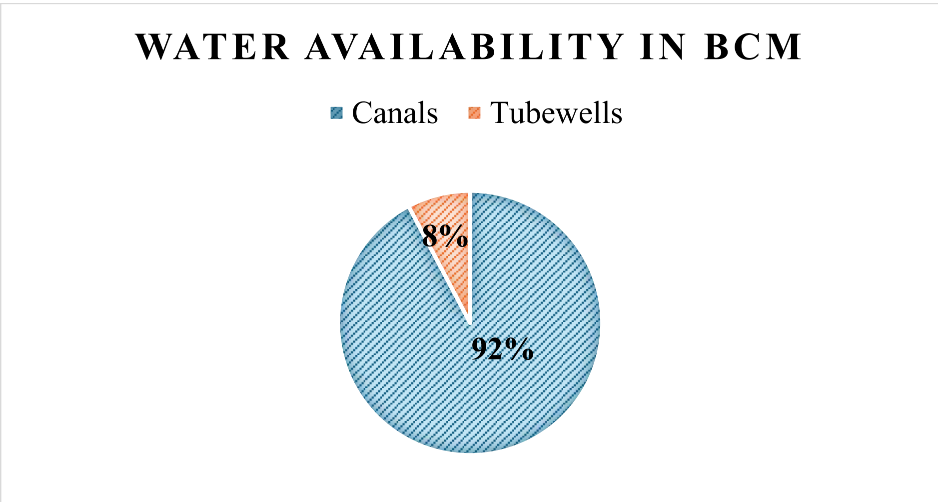

Figure 23: Source-wise water availability in Karaikal (BCM) (Source: PMKSY - Karaikal)

The region of Karaikal is supported by various combinations of surface water abstraction from the Arasalar system and groundwater sources like borewells and infiltration galleries for the domestic water supply. The key parameters of the urban and rural water supply infrastructure are summarised in Table 14 which are obtained from PWD of Puducherry government for the year 2025-2026. The urban water supply system covers approximately 35.20 sq.km with a design capacity of 18.40 MLD and a current supply of approximately 13.5 MLD at 135 LPCD, serving about 1.36 lakh population and achieving a service coverage of approximately 116.5 percent. The water supply for rural areas is maintained through commune panchayats, depends predominantly on groundwater sources with design capacity of 7.64 MLD and a current supply of approximately 6.28 MLD at 135 LPCD, serving around 1.13 lakh population with service coverage of about 82.1 %.

Table 14: Domestic water supply infrastructure Urban and Rural, Karaikal

Category	Urban	Rural
Area Covered (sq.km)	35.20	140.54
Source	Surface water + Groundwater	Groundwater
Design Capacity (MLD)	18.40	7.64
Current Supply (MLD)	13.5	6.28
Supply Rate (LPCD)	135	135
Population Served	1.36 lakh	1.13 lakh
Service Coverage (%)	116.5%	82.1%

The infrastructure includes multiple overhead tanks, sumps and pumping systems which are distributed across different zones and communes, supported by a network of pipelines connecting to headworks, treatment plants, and mainly distribution centers. Based on the average of the last five years, the total annual water availability in Karaikal is estimated at 116.3552 MCM, of which surface water contributes 107.37 MCM (92.28 percent) and groundwater accounts for 8.9852 MCM (7.72 percent), which highlights the dominance of surface water resources on this region.

5.5 Agricultural water usage for Tamil Nadu

The irrigation pattern across the Tamil Nadu portion of the CRB reveals a pronounced spatial divide between canal-dominated delta districts and groundwater-dependent upland districts. Source-wise irrigated area data were obtained from the District Level Entry System of the Directorate of Economics and Statistics for the year 2024-25. The total gross irrigated area is approximately 22.51 lakh hectares against a net irrigated area of 16.85 lakh hectares, yielding an overall irrigation intensity of 1.34. Delta districts such as Thanjavur, Thiruvarur, and Nagapattinam are predominantly canal-irrigated, with canal contribution ranging from 39 to 63 percent, reflecting strong reliance on the Cauvery distributary system. In contrast, upland districts such as Dharmapuri, Salem, and Coimbatore exhibit near-complete dependence on groundwater, with Dharmapuri recording nearly 100 percent well-based irrigation, while districts such as Cuddalore and Pudukkottai show a mixed pattern indicating a transitional irrigation system between the delta and dryland zones.

The district level water demand were done in three different parameters, namely groundwater dependency ratio, irrigation intensity, and proportion of area under repeated irrigation are computed from the source wise irrigated area data (Table 26 & Table 27) to assess the inter district difference in agricultural water stress. Dharmapuri district records the highest groundwater dependency ratio of 1 along with the Perambalur district, where complete dependence is on well based irrigation with zero canal contribution. The Dharmapuri district also records the highest irrigation intensity of 1.85 and highest proportion under repeated irrigation of value 0.85 among all the districts, which confirms the water stress in the district across all the parameters. In contrast the delta districts of Thiruvarur and Mayiladuthurai show a complete dependence on the canal-based irrigation, and which reflects the groundwater dependency as 0, also their irrigation intensity is among the highest in the basin at 1.69 and 1.70, which corresponds to the high repeated irrigation proportions of 0.69 and 0.70.

Districts like Coimbatore, Dindigul, and Tiruppur record the lowest irrigation intensities and minimal repeated irrigation, indicating limited multiple cropping. In view of this they also show higher levels of Groundwater dependency values of 0.87, 0.89 and 0.77. From these spatial patterns, it confirms that the upland districts of Dharmapuri, Perambalur, Salem, Nilgiris, Namakkal, and Krishnagiri face a quantitively different water resource challenge from the delta districts, with groundwater serving as the near-exclusive irrigation source in the absence of canal infrastructure, compounded by high irrigation intensity in several of these districts.

5.6 Agricultural water usage for Karnataka

The irrigation pattern in the Karnataka portion of the CRB is characterized by strong groundwater dependence across most districts, with notable exceptions in canal-served areas. The total net irrigated area across the eleven districts is approximately 11.30 lakh hectares, with Tumkur recording the highest at 2,75,861 ha followed by Mysuru (1,81,123 ha) and Mandya (1,71,560 ha), while Kodagu records the smallest at 1,086 ha followed by Bengaluru Urban (10,624 ha) and Bengaluru Rural (27,163 ha). District-wise irrigation data were sourced from the Directorate of Economics and Statistics through the District Level Entry System for the year 2024-25.

Similar to the state of Tamil Nadu three different water demand parameters are computed from the source-wise irrigated area data for the Karnataka CRB districts presented in Table 28 & Table 29. Tumakuru, Bengaluru Rural, and Bengaluru Urban record groundwater dependency ratios of 1.00 or near 1.00, indicating complete or near-complete dependence on well-based irrigation with zero canal contribution. Chikkaballapura (GDR 1.00) and Ramanagara (GDR 1.00) follow the same pattern. Canal irrigation is significant only in Mandya (101,562 ha, GDR 0.54) and Mysuru (64,946 ha, GDR 0.70), both supported by the Krishnarajasagara reservoir command area. Hassan records a moderate canal contribution (22,496 ha, GDR 0.81), while Kodagu registers the lowest groundwater dependency in the Karnataka segment (GDR 0.06) owing to its limited irrigated area of 1,086 ha, nearly all canal-sourced.

The Irrigation Intensity is observed to be highest in the districts of Mandaya and Mysuru having value of 1.37, which is followed by Chikkaballapura and Hassan, while the districts Kodagu and Bengaluru Urban record 1.00 with zero repeated irrigation. Tumakuru, despite recording the largest net irrigated area in the Karnataka segment at 277,843 ha, maintains an irrigation intensity of only 1.01, indicating that its high agricultural water demand is driven by the extent of irrigated area rather than multiple cropping. Chikkamagaluru is distinctive in recording 45 percent of its net irrigated area from other sources (61,159 ha), likely representing lift and minor irrigation schemes, resulting in a low GDR of 0.45. Chamarajanagar records a high GDR of 0.90 combined with an irrigation intensity of 1.24, placing it among the districts with elevated groundwater stress. Overall, groundwater dependency dominates irrigation across most Karnataka CRB districts, with canal irrigation limited to Mandya and Mysuru, leaving Tumakuru, Chikkaballapura, Bengaluru Rural, and Ramanagara most vulnerable to extraction pressure.

5.7 Agricultural water usage for Kerala

The Kerala segment of the CRB, comprising Palakkad, Wayanad, and Idukki, demonstrates a comparatively lower total irrigated area and a more diversified source distribution than Karnataka and Tamil Nadu. The total net irrigated area across the three districts is approximately 1,65,913 ha, with Palakkad recording the highest at 81,174 ha, followed by Idukki (68,164 ha) and Wayanad (16,574 ha). Irrigation source and area data were extracted from the District Level Entry System of the Directorate of Economics and Statistics for the year 2024-25.

From the website the irrigation source profile of the three Kerala CRB districts differs among them which are present in Table 30 & Table 31, where Palakkad district records highest canal irrigated area at 36,412 ha. And Groundwater dependency ratio of 0.31. Idukki shows a more distributed pattern with a Groundwater dependency ratio of 0.41, which are driven by wells, and tanks, while the canal irrigation is minimal at 1,308 ha. The last district of the three Wayanad records the lowest groundwater dependency ratio at 0.003, which depicts a near complete dependence on the other sources which is 16,398 ha of 16,574 ha of the net irrigated area, indicating the reliance on the rain fed and localized surface water systems. The Irrigation intensity in these three districts remain closer to each other, with Wayanad at 1.13, Palakkad at 1.11 and the last being Idukki at 1.06 with the corresponding PRI values of 0.13, 0.11 and 0.06, which indicates a limited multiple cropping pattern in contrast to the Tamil Nadu and Karnataka states. Overall, agricultural water usage in the Kerala portion is the least intensive among the four basin states, with Palakkad as the primary irrigation district due to its canal infrastructure and paddy cultivation, while Wayanad and Idukki are characterized by other-source-dependent irrigation systems with minimal groundwater abstraction.

5.8 Agricultural water usage for Puducherry (Karaikal Region)

The Puducherry (Karaikal) region represents a small but hydrologically distinct agricultural zone within the CRB. The net irrigated area of Karaikal is 4,982 ha, with a gross irrigated area of 5,771 ha, yielding an irrigation intensity of 1.16. Canal irrigation is the dominant source, with the entire net canal-irrigated area at 4,092 ha constituting approximately 82.1 percent of the total net irrigated area. This reflects the well-developed distributary network of the Cauvery system that serves the deltaic Karaikal region. Well irrigation (tubewells) accounts for 880 ha (approximately 17.7 percent of net irrigated area), serving as a supplementary source. Other sources contribute a negligible 10 ha.

Karaikal records a GDR of 0.18, confirming high surface water dependency comparable to the delta districts of Thiruvarur (GDR 0.00) and Nagapattinam (GDR 0.00), with canal irrigation accounting for 4,092 ha of 4,982 ha net irrigated area (82 percent). Well irrigation increases from 880 ha (net) to 1,669 ha (gross), indicating that supplementary cropping is primarily groundwater-supported. The irrigation intensity of 1.16 and PRI of 0.16 indicate moderate multiple cropping. The region's irrigation security is accordingly linked to upstream regulated releases from the Cauvery system, with groundwater serving a supplementary rather than primary role. Source-wise irrigated area data for Karaikal were compiled from the District Level Entry System (data.desagri.gov.in) for the year 2024-25 are shown in the Table 32 & Table 33.

5.9 Water resource projects

Water resource development in the CRB has followed two broad tracks- large storage-based irrigation and hydropower projects in the upper basin and run-of-river diversion systems in the middle and lower reaches. Karnataka hosts 29 major and medium irrigation projects within the CRB, while Tamil Nadu accounts for 25. The areas benefited under Karnataka's command lie predominantly in Mysuru, Mandya, Hassan, and Kodagu districts; in Tamil Nadu, large parts of Thanjavur and Tiruchirappalli districts receive irrigation through canal systems drawing from the Grand Anicut and Upper Anicut on the Cauvery mainstream. The list of Major and medium irrigation projects are presented in the Table 34 for the CRB.

Among the major storage projects, Mettur Dam (Stanley Reservoir) in Salem is the largest structure in the entire CRB, with a gross storage of 2,708.79 MCM on the Cauvery mainstream, serving multipurpose functions for Tamil Nadu's delta command. In Karnataka, Krishna Raja Sagara (KRS) on the Cauvery in Mandya carries a gross storage of 1,400.31 MCM and dead storage of 124.62 MCM, with a catchment area of 10,619 sq. km, primarily serving Mandya and Mysuru districts. Hemavathi Dam, located on the Hemavathi tributary with a catchment of 2,810 sq. km, holds a gross storage of 1,050.63 MCM and dead storage of 37.63 MCM, feeding the extensive Hemavathi command across Tumakuru and Hassan. Kabini Dam on the Kabini tributary in Mysuru records a gross storage of 552.7 MCM. Harangi Dam near Somwarpet on the Harangi river is a multipurpose project with a catchment of 419.58 sq. km, gross storage of 240.69 MCM, and dead storage of 12.09 MCM, supporting both irrigation and power generation in Kodagu and upper Mysuru. In Kerala, the Karapuzha project in Wayanad serves irrigation within the CRB boundary, with its canal network extending 53.9 km across 7 mapped segments. Beyond these major structures, 10 masonry anicuts constructed across the Cauvery mainstream and its tributaries in Tamil Nadu form the backbone of deltaic water distribution, diverting flows into the distributary network that sustains paddy cultivation in the lower basin without reliance on upstream storage releases alone.

5.10 Summary

The water supply assessment across the CRB reveals uneven infrastructure development, varying source dependency, and significant data gaps across the four basin states. In Tamil Nadu, designed Cauvery-based surface water abstraction capacity totals approximately 550

MCM per year across ten districts, with Salem (200.79 MCM), Karur (115.27 MCM), and Tiruchirappalli (69.70 MCM) accounting for the largest shares. Salem and Karur maintain surplus designed capacity relative to projected 2025 domestic demand, while Ariyalur (21 percent coverage), Nagapattinam (28 percent), and Perambalur (34 percent) face severe supply deficits, with the balance met through groundwater and non-Cauvery sources.

In Karnataka, BWSSB delivers approximately 1,450 MLD (529 MCM per year) to Bengaluru under a total Cauvery allocation of 29 TMC, with further augmentation proposed under CWSS Stage V having 775 MLD. Non-metropolitan KUWSDB towns collectively require approximately 1,017 MCM per year, of which recorded Cauvery drawl covers only about 9 percent, with the remainder met through supplementary groundwater and local storage. Karaikal records a total annual water availability of 116.36 MCM, with 92 percent derived from surface canal sources, achieving 116.5 percent urban service coverage but only 82.1 percent rural coverage.

Irrigation source data confirms a clear spatial divide across the basin. Tamil Nadu's delta districts are predominantly canal-irrigated (39-63 percent canal share) with GDR values at or near zero, while upland districts such as Dharmapuri (GDR 1.00), Perambalur (GDR 1.00), and Salem (GDR 0.99) depend almost entirely on groundwater. In Karnataka, Tumakuru, Chikkaballapura, Bengaluru Rural, and Ramanagara similarly record GDR values of 1.00 or near 1.00, with canal irrigation limited to Mandya and Mysuru. Kerala's three CRB districts record the lowest irrigation intensities in the basin (1.06 to 1.13), with Palakkad the only district with significant canal infrastructure. The absence of consolidated district-level supply data for the industrial and agricultural sectors across all four basin states restricts this assessment to the domestic sector, supplemented by irrigation source pattern analysis. Compilation of sector-wise supply records from irrigation departments, groundwater authorities, and industrial development agencies remains essential for a complete basin-level demand-supply assessment.

6. SPATIAL DISTRIBUTION OF DEMAND AND SUPPLY

The spatial distribution of water demand and supply within the CRB reflects pronounced regional variations driven by population density, cropping patterns, industrial concentration, and the uneven distribution of surface water infrastructure across the upper, middle, and lower basin zones. Water demand is concentrated in agriculturally intensive deltaic districts such as Thanjavur, Thiruvarur, and Cuddalore in Tamil Nadu, which sustain paddy cultivation under the Cauvery distributary network, and in rapidly urbanizing districts such as Bengaluru Urban and Coimbatore, which together account for a disproportionate share of domestic water demand. Correspondingly, water supply systems are structured around 106 dams, 83 barrages, weirs, and anicuts, and a canal network spanning approximately 12,883 km across Karnataka and Tamil Nadu that collectively regulate and distribute Cauvery flows across command areas. Storage infrastructure is heavily concentrated in the upper basin Karnataka zone, anchored by Krishna Raja Sagara (1,400 MCM), Hemavathi (1,050.63 MCM), Mettur (2,708.79 MCM), and Kabini (552.7 MCM) reservoirs, while the lower deltaic zone depends primarily on run-of-river diversions through anicuts and barrages rather than large impoundment.

Lift irrigation systems recorded in India-WRIS are confined to 20 stations in the Karnataka CRB zone, supplementing gravity-fed supply in topographically constrained areas. Groundwater monitoring is maintained through 778 CGWB observation wells distributed across the basin, with the highest density in the Karnataka portion (397 wells) and the Tamil Nadu irrigated districts (293 wells). Urban domestic supply is further supported by ten Water Treatment Plants located across the Karnataka and Tamil Nadu segments. Town-level protected water supply infrastructure, including storage capacity by source type, is documented for all four basin states through Census Town Directory records, though capacity data for secondary and tertiary sources remain largely unreported for the Tamil Nadu segment. Household-level drinking water source data, comprising the number of households dependent on each main drinking water source for both Rural and Urban areas, are documented for all four basin states through Census HH-6 records, though the number of public water supply infrastructure units serving the basin as a whole could not be determined from the available data. Groundwater extraction infrastructure data across all four basin states were not available in a consistent format and are therefore not included in the present assessment, a limitation acknowledged in the data gaps discussion in Chapter 8.

6.1 Dams and Reservoirs

Dams and reservoirs constitute the primary water storage infrastructure within the CRB, enabling seasonal regulation of river flows for irrigation, hydropower generation, domestic water supply, and flood moderation. These structures impound monsoon runoff from the Western Ghats and the upper basin catchments for release during lean periods, sustaining both agricultural command areas and urban water supply systems across all four basin states. A total of 106 dams is mapped within the CRB from the India-WRIS National Register of Large Dams, distributed across Karnataka (56), Tamil Nadu (44), and Kerala (6). Dam infrastructure data for the Karaikal region was not available in the NRLD dataset.

- Dams in Tamil Nadu: Tamil Nadu records 44 dams within the CRB. Salem records the largest storage structure in the entire basin, Mettur Dam (Stanley Reservoir) on the Cauvery, with a gross storage of 2,708.79 MCM, serving multipurpose functions. Erode has 5 dams, of which Bhavanisagar (928.79 MCM) is the most significant multipurpose structure, while Gunderipallam (3.06 MCM), Noyyal Orathupalayam (17.49 MCM), Perumpallam (3.28 MCM), and Varattupallam (3.95 MCM) serve irrigation. The Nilgiris records 8 dams entirely dedicated to hydropower, including Avalanche (156 MCM), Emerald (156 MCM), Mukurthy (50.98 MCM), and Parson Valley (19.25 MCM, hydropower and water supply). Uthagamandalam contributes 6 hydropower dams including Upper Bhavani (101.2 MCM) and Pykara (56.63 MCM). Dharmapuri has 4 irrigation dams -Chinnar (14.26 MCM), Thoppaiyar (8.46 MCM), Nagavathy (4.65 MCM), and Kesarigullihalla (3.8 MCM). Dindigul records 5 irrigation dams. Tiruppur and Tiruppur together record 4 dams including Amaravathy Dam (114.62 MCM, multipurpose). Karur has 2 irrigation dams, Coimbatore 1 hydropower dam (Pillur: 44.4 MCM), Cuddalore 1 multipurpose structure (Veeranam: 41.48 MCM), Ariyalur 1 irrigation dam, and Trichy 1 irrigation dam. Five dams with district not recorded in the NRLD dataset -including Sandynallah (26.62 MCM), Palar Porandalar (43.17 MCM), and three hydropower forebays -fall within the Tamil Nadu CRB based on coordinates.

- Dams in Karnataka: Karnataka records 56 dams within the CRB, the highest among all basin states. Tumakuru and Chamarajanagar each record the highest district-level count at 14 dams. In Tumakuru, the 14 dams are predominantly for irrigation, including Marconahally (gross storage: 68 MCM), Mallaghatta Tank (18.29 MCM), Kadaba Tank (16.5 MCM), and Kunigal Doddakere (15.1 MCM). Chamarajanagar's 14 dams include Suvarnavathy Dam (35.65 MCM) and Gundal Dam (27.44 MCM), primarily serving irrigation and fishing. Ramanagara records 9 dams including Arkavathy Dam (44.9 MCM), Manchanabele (34.6 MCM), Kanva Dam (22.91 MCM), and Byramangala Tank (24.1 MCM). Mysuru contributes 7 dams with three major reservoirs: Kabini Dam (552.7 MCM), Nugu Dam (154.08 MCM), and Taraka Dam (111 MCM). Hassan records 4 dams, anchored by Hemavathi Dam (1,050.63 MCM) -the largest reservoir in Karnataka's CRB portion - and Yagachi Dam (102 MCM). Mandya has 2 dams, of which Krishna Raja Sagara (KRS) Dam (1,400 MCM) on the Cauvery is the largest multipurpose reservoir in the entire CRB. Kodagu records 2 dams including Harangi Dam (240 MCM). Bengaluru Urban contributes 3 water supply structures: Thippagondanahalli (94.72 MCM) and Hesaraghatta Reservoir (31.13 MCM). Overall, 34 Karnataka CRB dams serve irrigation, 3 are multipurpose, 2 serve water supply, and 7 have no purpose recorded in the NRLD dataset.
- Dams in districts of Kerala: Kerala records 6 dams within the CRB, confined to Wayanad (5) and Palakkad (1). Wayanad's 5 dams are dominated by the Kuttiyadi Augmentation scheme, comprising the main earthen dam, spillway, and two saddle structures, each with a gross storage of 209 MCM, serving multipurpose functions including hydropower and inter-basin transfer. Karappuzha Dam (76.5 MCM) in Wayanad serves multipurpose purposes. Palakkad records Siruvani Dam (25.6 MCM) serving irrigation and water supply for Coimbatore city. Dam data for Idukki district within the CRB and for the Karaikal region were not available in the NRLD dataset compiled for this study.
- Dams in Karaikal (Puducherry): Dam infrastructure data for the Karaikal region was not available in the National Register of Large Dams (NRLD) dataset compiled for this study. The Karaikal region, being a low-lying deltaic territory sustained primarily by Cauvery distributary flows, does not host independent dam structures.

Accordingly, no quantitative dam assessment is presented for this region. The distribution of dams and reservoirs in the CRB is presented in Figure 24 and the list of dams are given in Table 36.

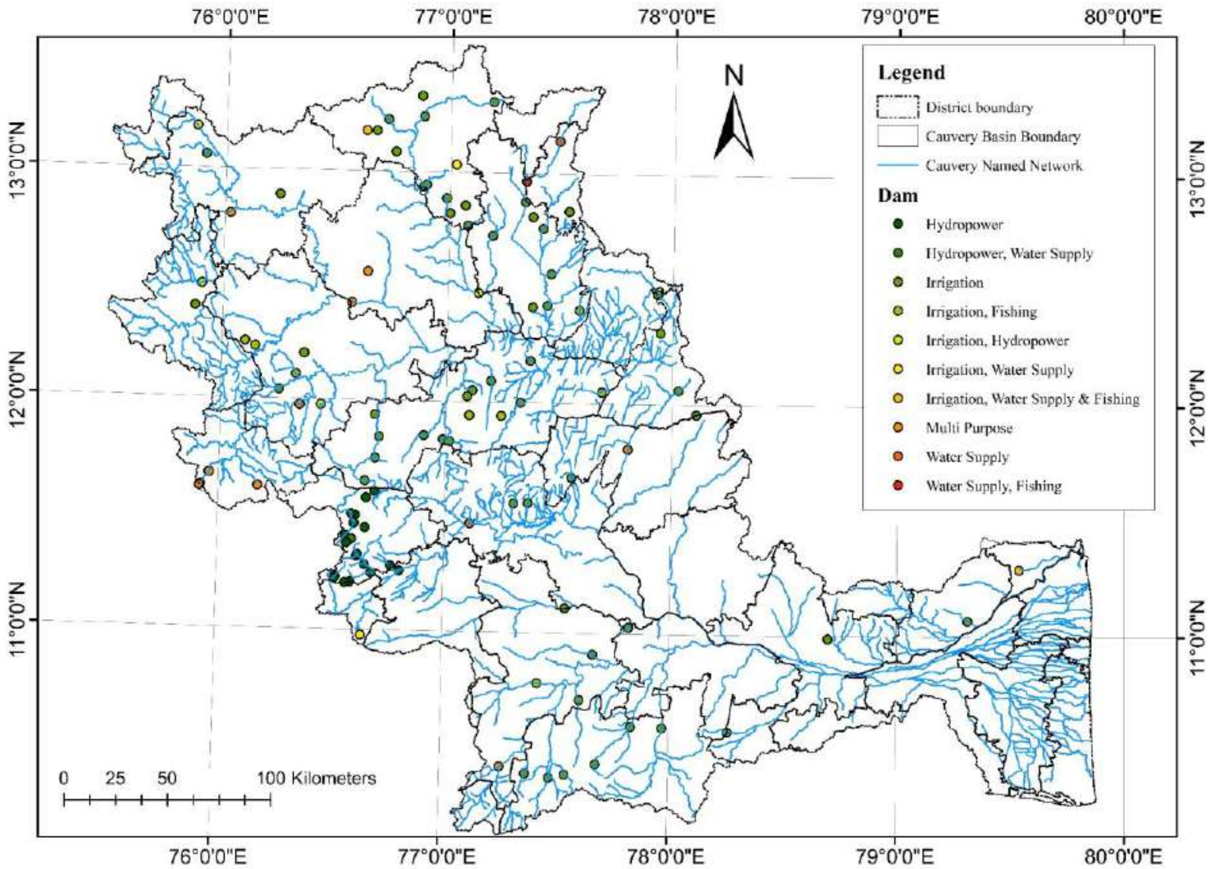

Figure 24: Dams in the CRB (Source: India WRIS)

6.2 Canal Network

Canal systems form the primary surface water distribution infrastructure of the CRB, conveying stored reservoir water and run-of-river diversions to agricultural command areas, urban water supply systems, and inter-basin transfer zones. The India-WRIS canal dataset for the CRB comprises 2,042 mapped canal segments with a total mapped length of approximately 12,883 km, spanning Karnataka (1,480 segments, 8,788.2 km), Tamil Nadu (555 segments, 4,040.8 km), and Kerala (7 segments, 53.9 km). By canal hierarchy, main canals account for 5,405.8 km, distributaries for 3,703.9 km, minors for 1,708.8 km, branch canals for 1,256.8 km, and sub-minors for 283.1 km.

- Canal Network in districts of Tamil Nadu: Tamil Nadu records 555 canal segments totalling 4,040.8 km. The Lower Bhavani Project is the most extensive Tamil Nadu system, with 205 segments spanning 890.1 km, serving the Erode and Tiruppur command areas. The Parambikulam-Aliyar Project contributes 127 segments covering 841.3 km in Tiruppur, Coimbatore, and Palakkad through an inter-basin transfer arrangement. The Kattalai system, with 32 segments and 421.1 km, serves the deltaic command in Tiruchirappalli and Thanjavur. The Cauvery-Mettur system covers 296.9 km across 13 segments in Salem and Namakkal. The Lower Coleroon Anicut System spans 248.9 km across 19 segments and the Pullambadi Canal covers 213.2 km across 31 segments, both serving the lower Cauvery delta. The Amaravathy system contributes 255.7 km across 60 segments in Tiruppur and Dindigul, while the Kodivery Anicut System and Mettur Canal System account for a further 172.4 km and 167.4 km respectively.

- Canal Network in districts of Karnataka: Karnataka accounts for the largest share of canal infrastructure in the CRB with 1,480 segments spanning 8,788.2 km across six major project systems. The Hemavathi (Tumakuru) Reservoir Project is the most extensive, comprising 502 segments totalling 3,101.4 km, primarily serving Tumakuru and Hassan districts. The Krishnaraja Sagar system covers 193 segments and 1,376.7 km, distributing Cauvery water across Mandya, Mysuru, and parts of Hassan. The Harangi project contributes 285 segments spanning 892.1 km in the Kodagu and Mysuru zones. Kabini command canals extend 736.2 km across 145 segments in Mysuru and Chamarajanagar. The Dr. D. Urs Canal system, with 125 segments and 666.3 km, serves the Cauvery left bank command in Mysuru. The Cauvery Anicut Channels, comprising 64 segments totalling 681.2 km, form the historic diversion network in Mandya and Mysuru. Smaller systems including Nugu (221.6 km), Taraka (207.2 km), and Marconahally (130.9 km) supplement irrigation supply in Mysuru and Tumakuru. The Votehole Reservoir Project contributes an additional 109.4 km across 22 segments.

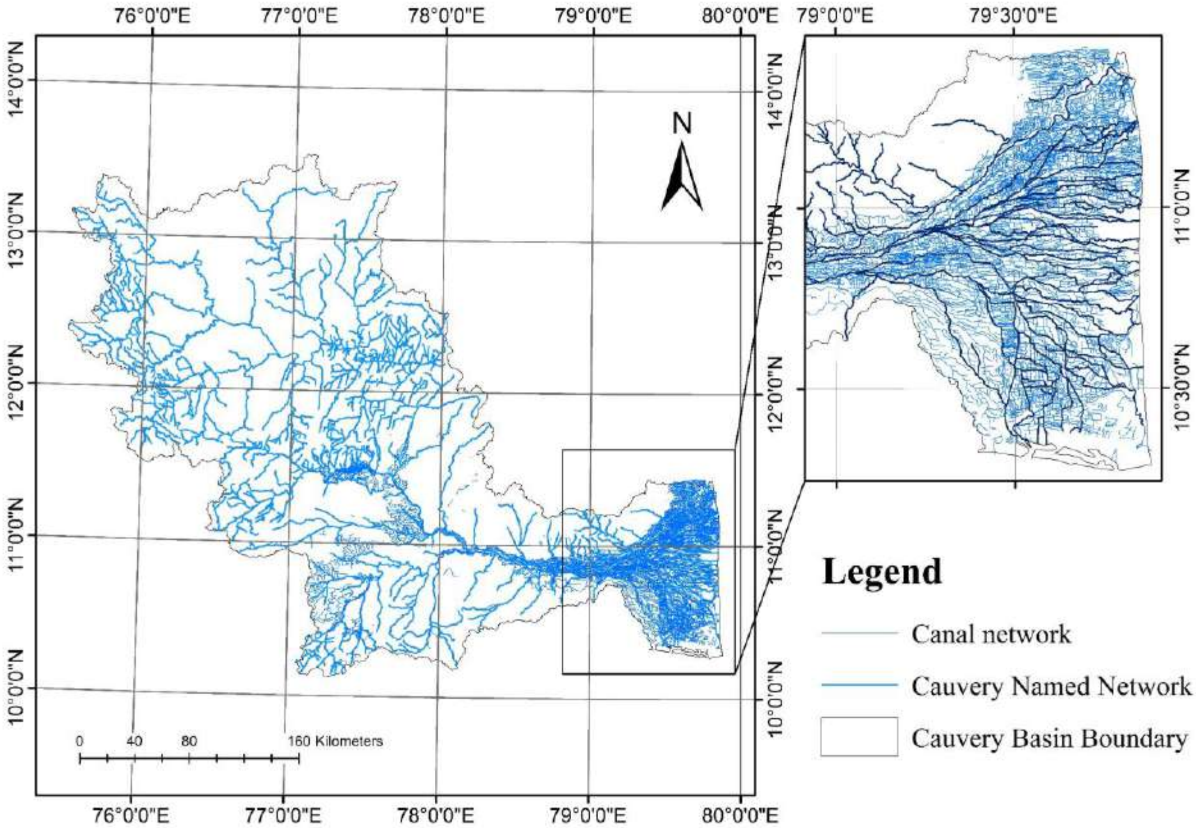

Figure 25: Canal network in the CRB (Source: India WRIS)

- Canal Network in districts of Kerala: Kerala records 7 canal segments totalling 53.9 km within the CRB, all belonging to the Karapuzha project in Wayanad district. The canal types comprise 2 main canals, 2 branch canals, 2 minors, and 1 distributary. Canal network data for Idukki and Palakkad CRB districts were not available in the India-WRIS dataset. Karaikal has no canal infrastructure recorded in the dataset.
- Canal Network in Karaikal (Puducherry): Canal network data for the Karaikal region was not recorded in the India-WRIS dataset. Water distribution in Karaikal is sustained through the Cauvery distributary system originating from the Grand Anicut (Kallanai) and its

downstream channels, the records of which are subsumed within the Tamil Nadu deltaic canal network. Separate canal network delineation for Karaikal as a distinct administrative unit was not available in the compiled dataset. The canal network of the CRB is illustrated in Figure 25.

6.3 Barrages, Weirs, and Anicuts

Barrages, weirs, and anicuts serve as run-of-river diversion structures within the CRB, directing river flows into canal intakes and maintaining pond levels for irrigation and domestic supply without large-scale storage impoundment. A total of 83 such structures are mapped from India-WRIS within the CRB, comprising 54 anicuts, 10 barrages, 9 weirs, 8 structures classified as others, and 2 balancing reservoirs within the barrage dataset. Tamil Nadu accounts for 57 structures and Karnataka for 26. No barrage, weir, or anicut records are available for Kerala or Karaikal in the India-WRIS dataset. Status of Barrages, Weirs, and Anicuts in districts of Tamil Nadu: Tamil Nadu records 57 diversion structures distributed across 13 districts. Tiruppur records the highest count at 15 anicuts, concentrated along the Amaravathy and its tributaries. Dindigul similarly records 15 anicuts along the Chinnar, Nanganji, and associated streams. Erode contributes 7 structures comprising 5 barrages and 2 anicuts, with Muthur Barrage on the Noyyal being the most significant in that district. Dharmapuri records 4 anicuts on the Chinnar and Parapalar rivers. Tiruchirappalli contributes 3 structures (1 anicut, 2 others) on the Cauvery and Kollidam. The Nilgiris and Namakkal each record 3 structures. Karur records 3 structures (2 anicuts, 1 other), while Ariyalur, Cuddalore, Salem, and Thanjavur each record a single structure. The Cauvery mainstream hosts the largest number of mapped diversion structures (22), followed by the Amaravathy (13), reflecting the historical importance of these rivers in sustaining canal irrigation in the basin.

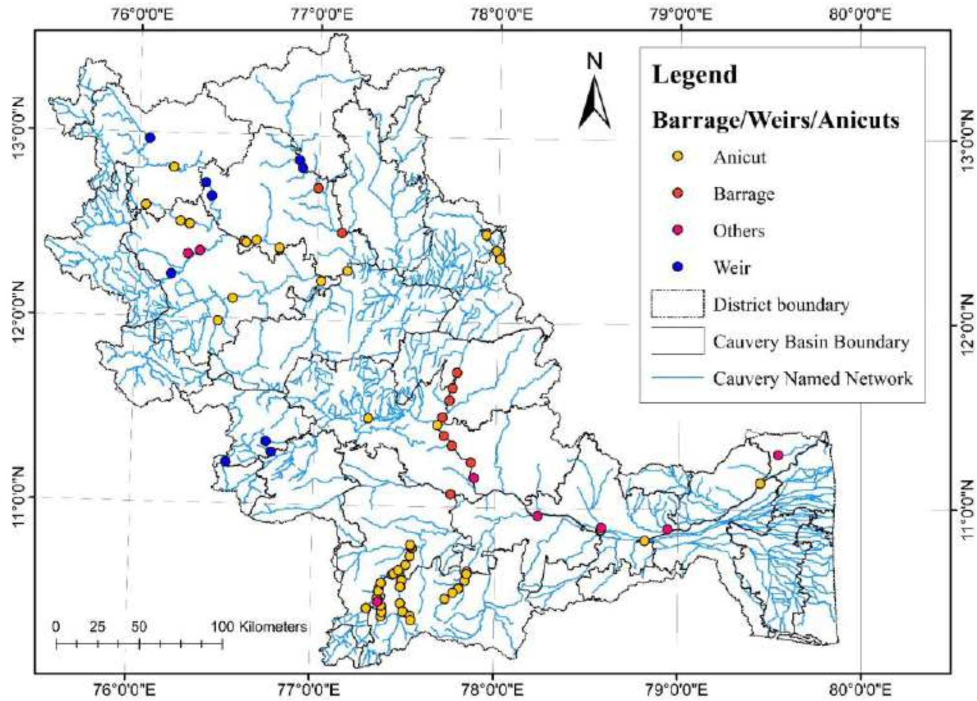

Figure 26: Barrages, Weirs, Anicuts in the CRB (Source: India WRIS)

Status of Barrages, Weirs, and Anicuts in districts of Karnataka: Karnataka records 26 diversion structures concentrated in three districts. Mandya accounts for 15 structures -the highest in the Karnataka CRB -comprising 7 anicuts, 4 weirs, 2 barrages, and 2 balancing reservoir entries, reflecting the dense regulation infrastructure in the KRS Dam command area and the Cauvery mainstream downstream of Srirangapatna. Mysuru contributes 8 structures (5 anicuts, 2 others, 1 weir) on Cauvery tributaries within the district. Hassan records 3 structures (2 anicuts, 1 weir). The 2 structures classified as reservoirs in the India-WRIS barrage layer for Mandya are balancing structures within the KRS command and do not represent independent storage dams. No barrage or anicut infrastructure is recorded for Kodagu, Ramanagara, Bengaluru Urban, Tumakuru, or Chamarajanagar districts in the dataset. Barrages, Weirs, and Anicuts in Karaikal (Puducherry): No barrage, weir, or anicut records for the Karaikal region are available in the India-WRIS dataset. Diversion infrastructure serving Karaikal is part of the broader Cauvery delta distributary system and is not separately enumerated at the union territory level in the available data sources. The spatial distribution of barrages, weirs, and anicuts in the CRB is presented in Figure 26 and the list of barrages /weirs/ anicuts are given in Table 35 .

6.4 Lift Irrigation Systems

Lift irrigation systems (LIS) augment gravity-fed canal supply by pumping water from rivers, reservoirs, and canals to elevated command areas where conventional flow-based irrigation is not feasible. Within the CRB, India-WRIS records a total of 20 lift stations, all located within the Karnataka portion of the basin. No lift irrigation infrastructure is recorded in India-WRIS for the Tamil Nadu, Kerala, or Karaikal portions of the CRB. This absence is attributable to data coverage limitations in the WRIS database for these states rather than the physical absence of pumping schemes. Status of Lift Irrigation Systems in districts of Karnataka: The 20 recorded lift stations in the Karnataka CRB are distributed across Hassan, Mysuru, Bengaluru Rural, Kodagu, and Mandya districts, all within the latitude range 12.0°N–13.0°N and longitude range 75.9°E–77.5°E. Of these, 9 stations have discharge and pump capacity data recorded. The Nanjapura Lift Station is the largest by reported discharge at 3.36 MCM with an installed pump capacity of 7,800 HP. Kachnahalli Lift Station Stage-I follows with a discharge of 3.11 MCM and pump capacity of 6,952 HP. Kama Samundra Stage-I records 2.77 MCM (4,200 HP) and Huchanakoppalu Stage-I records 2.43 MCM (600 HP). Kama Samundra Stage-II contributes 2.06 MCM (2,010 HP) and Huchanakoppalu Stage-II contributes 2.03 MCM (1,340 HP). Banahalli Hundi Lift Station records a discharge of 1.41 MCM (737 HP) and Kachnahalli Stage-III records 1.36 MCM (1,420 HP). Kachnahalli Stage-II has a pump capacity of 2,144 HP recorded but no discharge figure. The remaining 11 stations - Gorur, Arkavathi LIS I and II, Kabini LIS, Iggalur LIS A through D, Periyapatna LIS, and Somwarpet LIS -have no operational data recorded in the WRIS database.

No lift irrigation data was recorded for Tamil Nadu, Kerala, or Karaikal districts within the CRB in the available India WRIS dataset. Given the flat deltaic topography of Karaikal, gravitational flow through Cauvery distributaries constitutes the primary irrigation supply mechanism, and dedicated pumping schemes are not reported in the compiled dataset. The spatial distribution of lift irrigation systems in the CRB is presented in Figure 27 and the list of Lift irrigation system are given in Table 37.

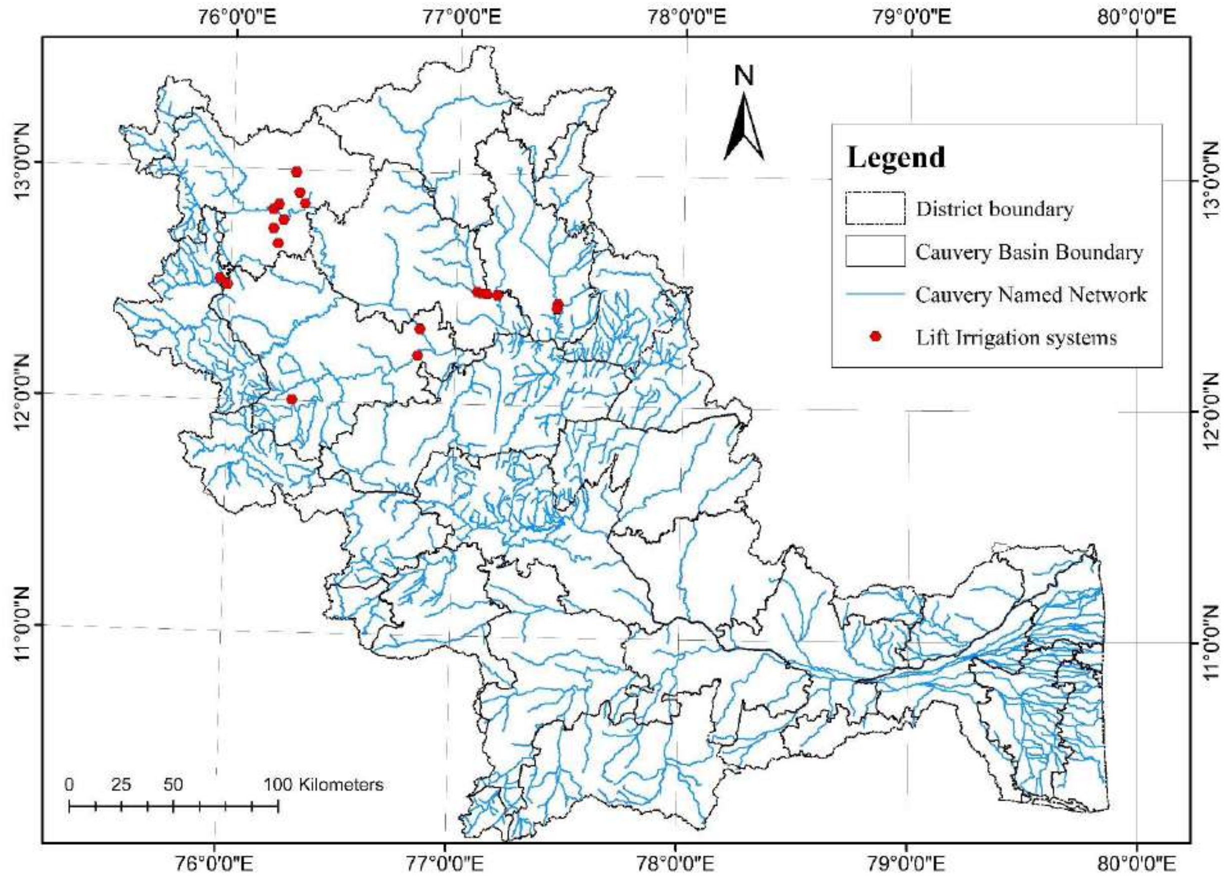

Figure 27: Lift Irrigation systems in CRB (Source: India WRIS)

6.5 Groundwater Monitoring Infrastructure

Groundwater monitoring within the CRB is carried out through a network of CGWB observation wells that track seasonal and long-term groundwater level fluctuations, aquifer behaviour, and recharge patterns across the basin. The India-WRIS Cauvery Basin Report (2014) recorded a total of 873 observation wells distributed across the three CRB sub-basins - 115 in the Cauvery Upper Sub-basin, 612 in the Cauvery Middle Sub-basin, and 146 in the Cauvery Lower Sub-basin. The current India-WRIS dataset compiled for this study records 778 CGWB observation wells within the CRB, distributed across Karnataka (397), Tamil Nadu (293), Kerala (86), and Karaikal/Puducherry (2). The difference of 95 wells between the two datasets reflects updates, reclassifications, and revisions to the WRIS database subsequent to the 2014 basin report. All 778 wells in the current dataset are attributed to the CGWB and fall within the Cauvery Basin designation. It must be noted that these are CGWB groundwater level monitoring wells only and do not represent the full inventory of open wells, borewells, or domestic groundwater extraction structures within the basin, data for which was not available in a consistent format across all four basin states.

According to the Cauvery Basin Report (2014) from NRCD, groundwater in the basin occurs primarily in weathered gneisses, granites, and in joints, fractures, and shear zones of fresh rocks. Water is tapped in Archaean rocks generally at depths ranging from 6 to 21 m, and occasionally to 27 m. Groundwater levels across a major part of the basin fall between 10 and 20 m below ground level, while in the Cauvery delta the water table is less than 10 m bgl during pre-monsoon periods.

- CGWB Observation Wells in districts of Karnataka: Karnataka records 397 CGWB observation wells within the CRB the highest among all basin states distributed across 9 districts. These correspond predominantly to the Cauvery Upper and Middle sub-basins as defined in the India-WRIS basin framework. Hassan records the highest district count at 76 wells, reflecting intensive monitoring in a district characterised by hard-rock aquifers and significant irrigation dependency under the Hemavathi command. Mysuru and Kodagu each record 66 wells, consistent with the high groundwater monitoring density warranted by the presence of the major KRS, Kabini, and Harangi reservoir command areas. Mandya records 60 wells and Bengaluru Rural 49. Tumakuru records 23 wells, Chamarajanagar 22, Chikkamagaluru 20, and Bengaluru Urban 15. Observation well data is not available in the compiled dataset for Ramanagara district within the Karnataka CRB, indicating a gap in monitoring coverage for that district.

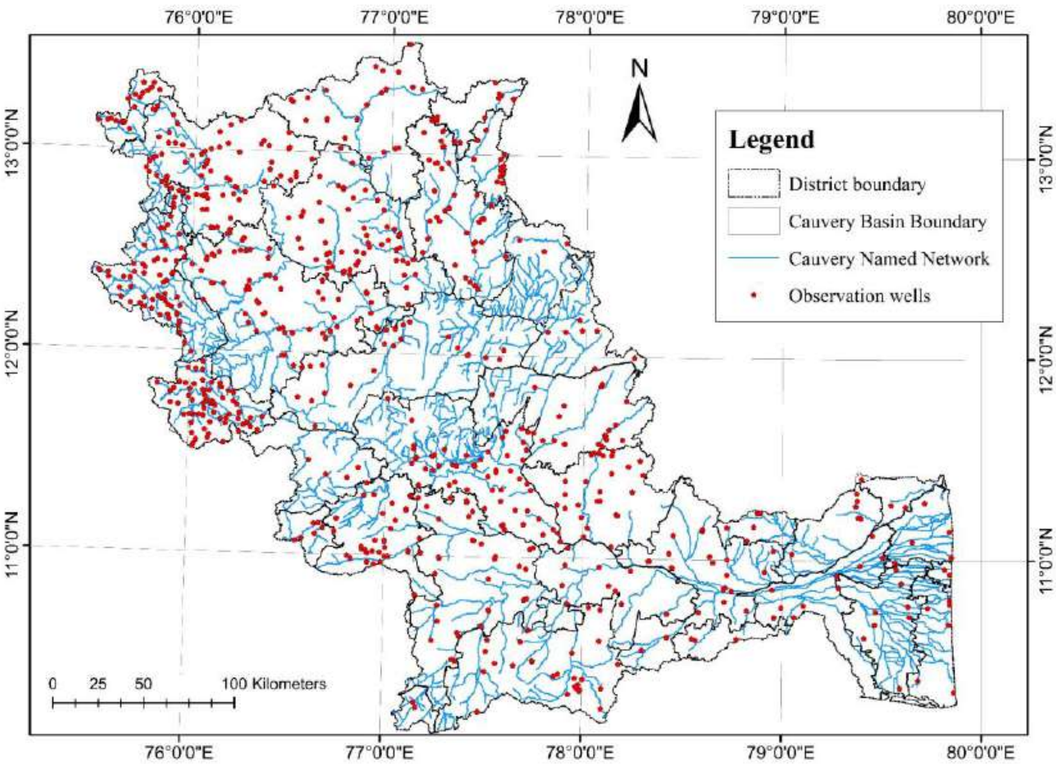

Figure 28: CGWB Observation wells in the CRB (Source: [India WRIS]())

- CGWB Observation Wells in districts of Tamil Nadu: Tamil Nadu records 293 CGWB observation wells across 18 CRB districts, corresponding primarily to the Cauvery Middle and Lower sub-basins. Erode records the highest district count at 73 wells, consistent with its large - irrigated area and dependence on both surface and groundwater sources. Coimbatore follows with 31 wells, Dindigul with 26, Tiruchirappalli with 24, Namakkal with 23, Salem with 22, and Tiruppur with 21. Nagapattinam records 12 wells, Karur 11, Thanjavur 10, and Thiruvarur 8. Dharmapuri records 7 wells, Ariyalur 6, Perambalur and The Nilgiris 5 each, Pudukkottai, Cuddalore, and Krishnagiri 3 each. Observation well records for Thiruvarur district were not present in the compiled WRIS dataset. Mayiladuthurai district, carved out of Nagapattinam in 2020, is not separately enumerated and its wells are subsumed under Nagapattinam in the current dataset.

- CGWB Observation Wells in districts of Kerala: Kerala records 86 CGWB observation wells within the CRB, distributed across 3 districts. Wayanad accounts for the overwhelming majority at 75 wells, reflecting the importance of groundwater monitoring in a district characterised by plantation agriculture and reliance on subsurface water during dry periods. Palakkad records 9 wells and Idukki 2 wells. No observation well records are available for other Kerala CRB districts in the compiled dataset.
- CGWB Observation Wells in Karaikal (Puducherry): Karaikal records 2 CGWB observation wells within the CRB. This reflects both the limited spatial extent of the Karaikal region within the basin boundary and its predominantly deltaic character, where domestic and irrigation water needs are met primarily through Cauvery surface water distributaries rather than groundwater abstraction. The distribution of CGWB observation wells in the CRB is presented in Figure 28.

6.6 Water Treatment Plants (WTP)

Water Treatment Plants (WTPs) form a critical component of urban domestic water supply infrastructure within the Cauvery River Basin. Based on location data provided for the present assessment, ten WTPs have been identified across the basin's Karnataka and Tamil Nadu segments, divided evenly between the two states. In Karnataka, WTPs are located at Bengaluru, Mysuru, Mandya, Hassan, and Tumakuru, corresponding to five of the state's upper-basin districts. In Tamil Nadu, WTPs are located at Tiruchirappalli, Erode, and Tiruppur, with Thanjavur district hosting two plants - at Thanjavur town and at Kumbakonam - reflecting the concentration of urban supply infrastructure in the delta-head stretch of the basin. The identified plants are situated at district headquarters or major municipal centres in both states, consistent with their role in supporting BWSSB, KUWSDB, and TWAD-administered urban supply schemes. The spatial distribution of WTPs identified in this assessment is shown in Figure 29.

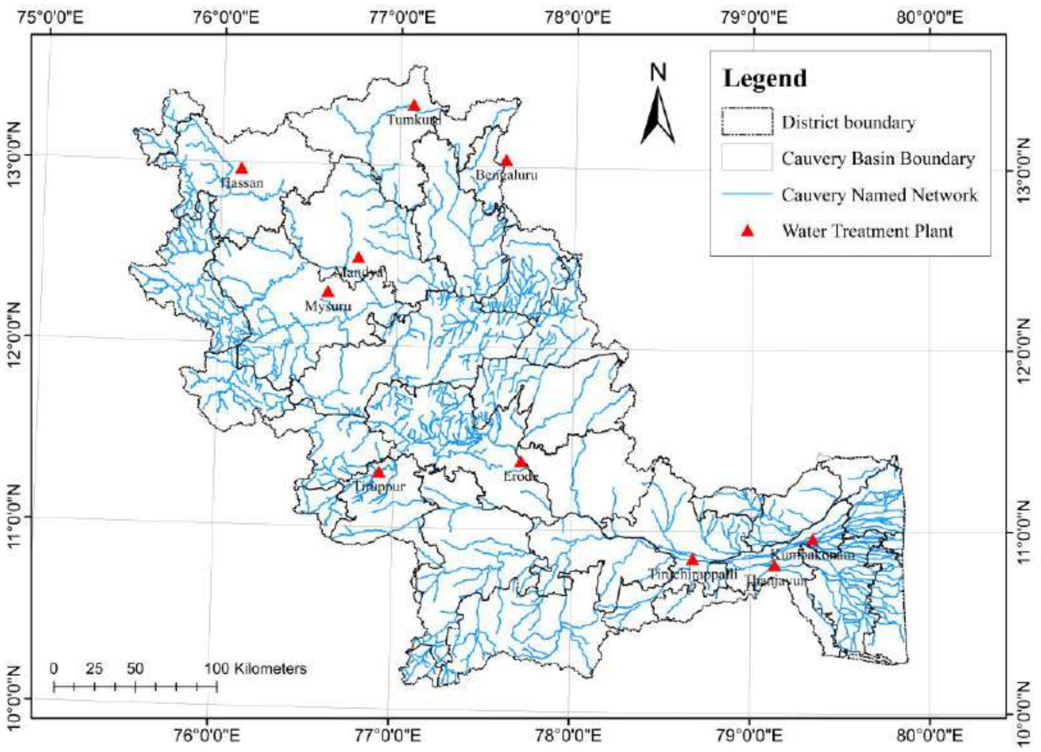

Figure 29: Water Treatment Plants in CRB

6.8 Household Drinking Water Source Distribution

Household-level drinking water source distribution across the CRB is compiled from the Census of India 2011 HH-6 table, which records the number of households dependent on each of ten main drinking water sources, disaggregated by Rural and Urban location. District-level totals, urban-area data, and rural-area data are presented in Tables 38, 39, and 40 respectively in the Annexure. Source-wise spatial distribution across the basin is mapped in Figures 30 onwards.

- **Treated tap water (TT)** is the dominant urban drinking water source across the basin, though its share varies substantially. In Karnataka, Mysuru records the highest urban TT dependence at 89.4 percent, followed by Mandya (81.8 percent), Bengaluru Urban (70.1 percent), Hassan (70.4 percent), and Chamarajanagar (74.6 percent). In Tamil Nadu, Coimbatore (91.9 percent), Tiruppur (86.1 percent), Tiruchirappalli (76.8 percent), and Salem (74.8 percent) lead. Karaikal records 85.2 percent urban TT dependence, consistent with its documented surface-water-based supply system. The lowest urban TT shares in the basin are recorded in the Cauvery delta districts - Thiruvarur (20.4 percent) and Thanjavur (27.4 percent) and in Bengaluru Rural district (20.0 percent) and Wayanad (25.5 percent). In rural areas, the contrast sharpens further: Karaikal (79.9 percent), Coimbatore (74.7 percent), and Tiruppur (59.5 percent) lead, while Tumkur (13.7 percent), Wayanad (14.4 percent), and Idukki (17.1 percent) record the lowest rural TT shares in the basin.

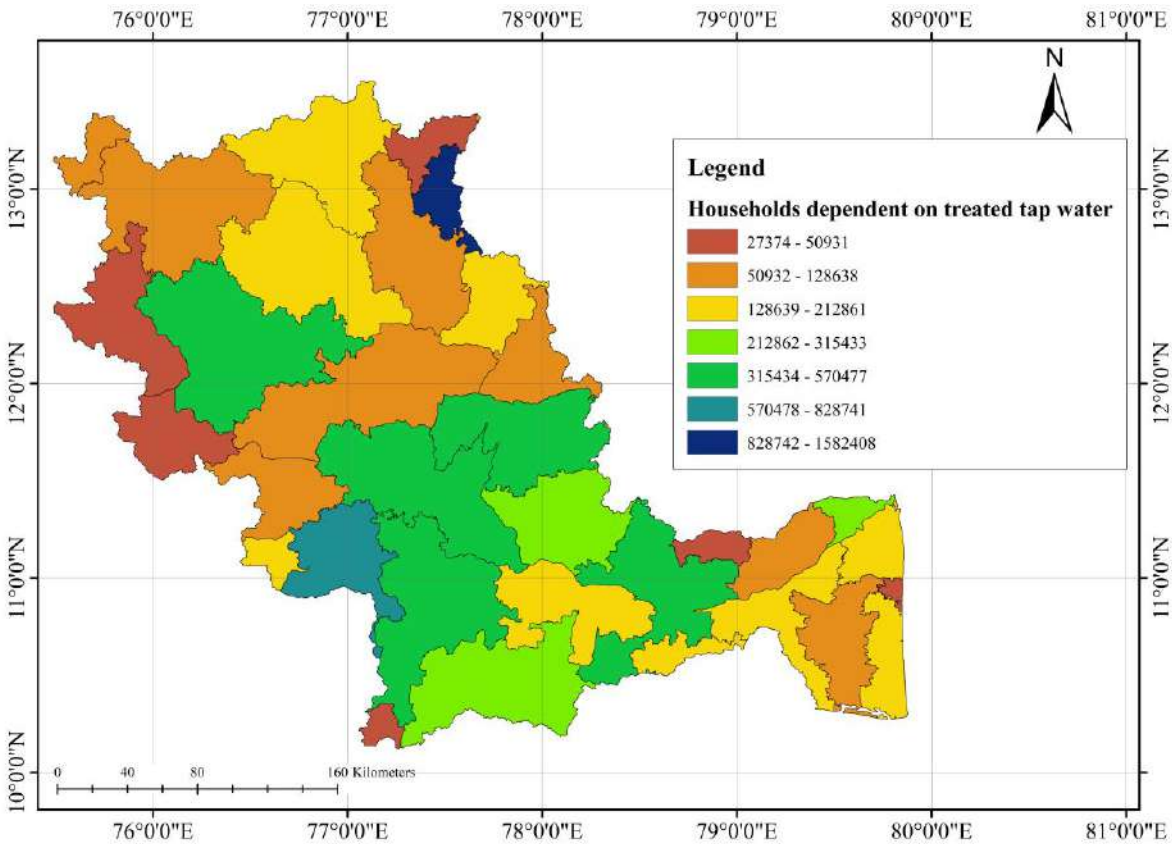

Figure 30: Distribution of Households Dependent on Treated Tap Water across CRB Districts

- **Untreated tap water (TU)** reflects the presence of piped distribution infrastructure without associated treatment and is concentrated in two distinct geographic settings. In Karnataka's upper-basin rural areas, TU constitutes the dominant rural source: Ramanagara (50.6 percent of rural households), Chikkaballapura (46.3 percent), Tumkur (47.6 percent), and Bengaluru Rural district (42.6 percent) all record rural TU shares exceeding 40 percent, indicating that piped supply in these districts reaches rural settlements largely in an untreated form. In the Tamil Nadu delta districts, both urban and rural TU shares are elevated: Thanjavur records 56.9 percent urban TU and 49.9 percent rural TU, Thiruvarur records 52.2 percent urban TU and 51.4 percent rural TU, and Perambalur records 34.8 percent urban TU and 58.3 percent rural TU - the highest rural TU share in the basin.

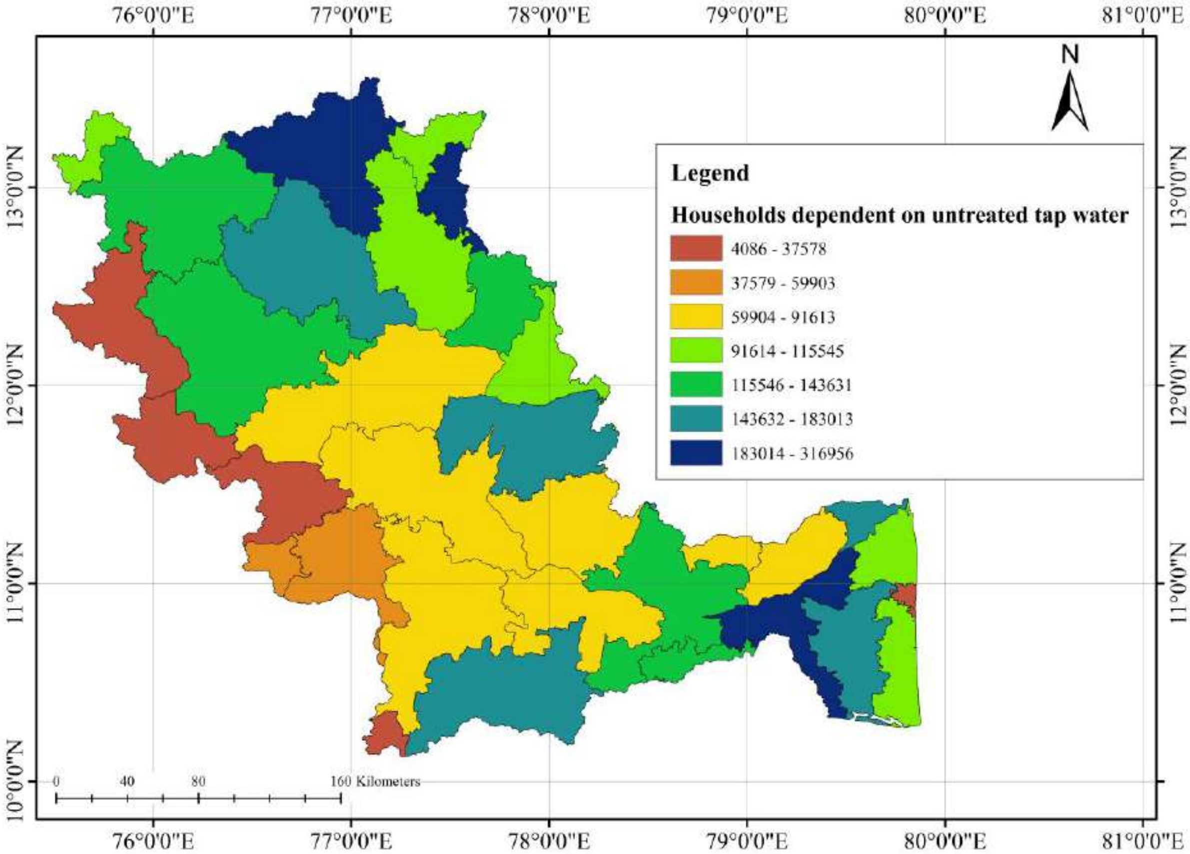

Figure 31: Distribution of Households Dependent on Untreated Tap Water across CRB Districts

- **Uncovered wells (UW)** are the single largest rural source in the three Kerala CRB districts. Wayanad records 58.9 percent rural UW dependence - the highest uncovered-well share in the basin - followed by Palakkad (43.9 percent) and Idukki (33.0 percent). Their urban shares in the same districts are similarly the highest in the basin: Wayanad (60.1 percent), Palakkad (31.9 percent), and Idukki (21.4 percent). Within Karnataka, Kodagu records the highest rural UW share (31.1 percent), followed by Chikmagalur (9.9 percent), both districts with dispersed settlement patterns in high-rainfall forested terrain. Tamil Nadu upland districts - Dharmapuri (17.9 percent rural UW), Salem (14.0 percent) - also show elevated well dependence relative to the basin median.

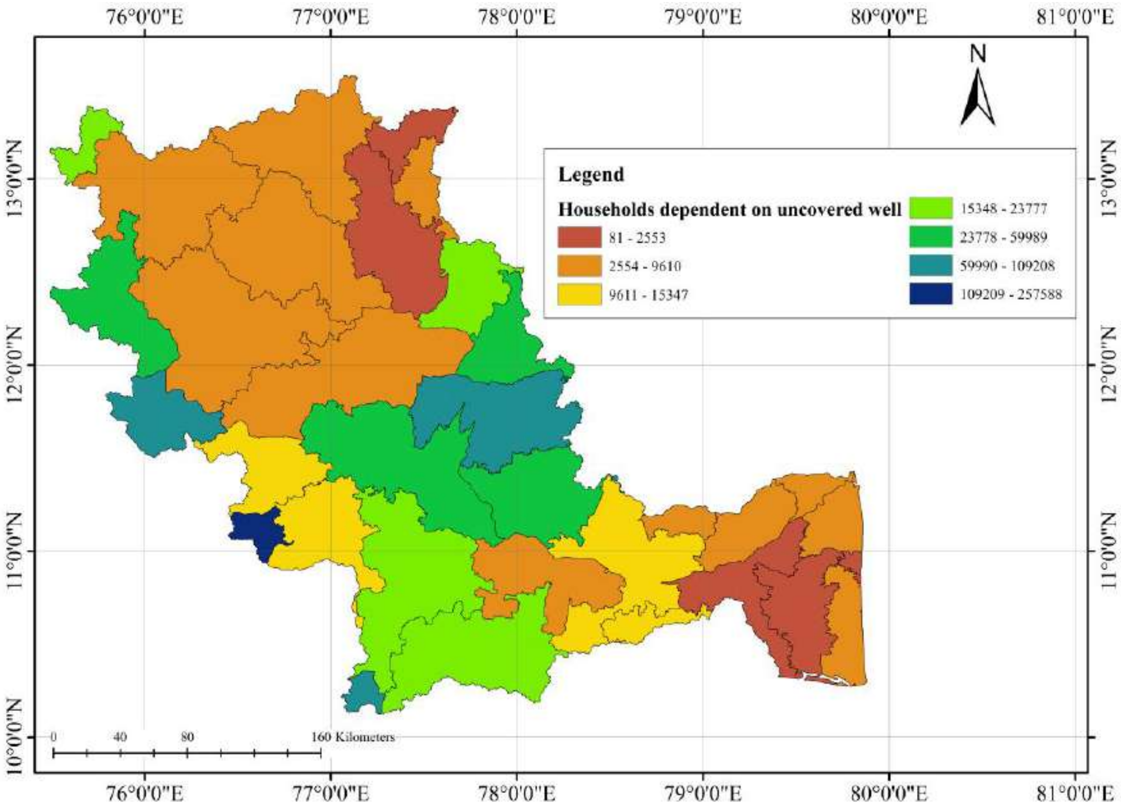

Figure 32: Distribution of Households Dependent on Uncovered Well across CRB Districts

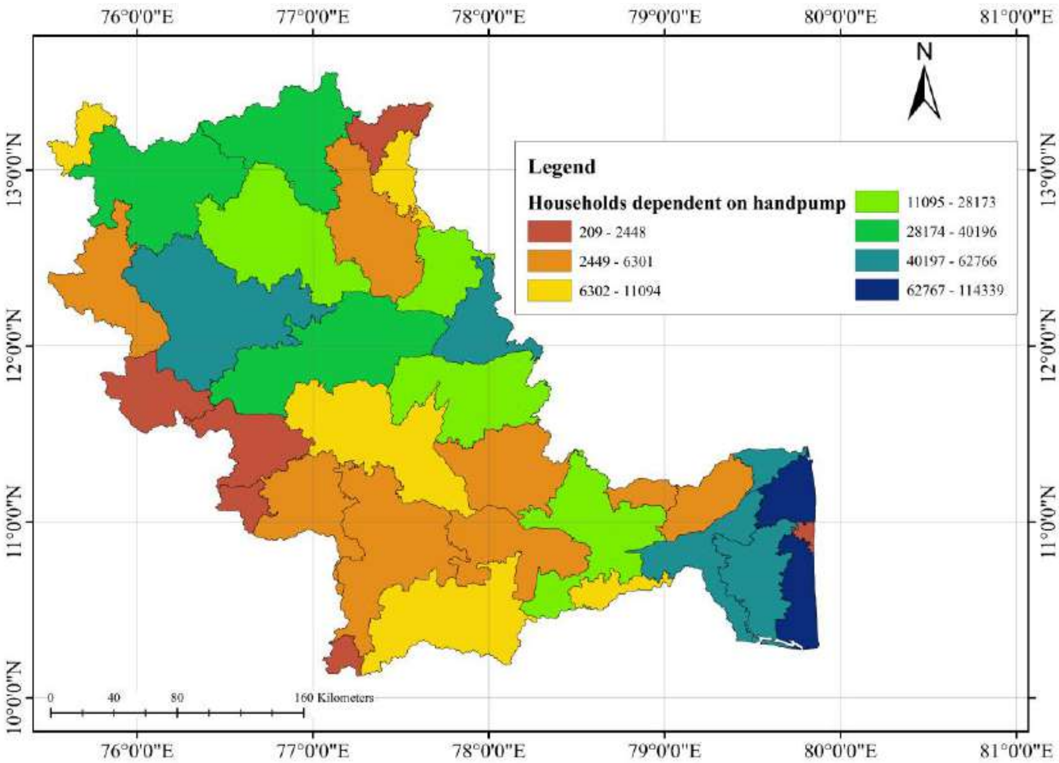

Figure 33: Distribution of Households Dependent on Handpump across CRB Districts

- **Handpumps (HP)** show their highest concentration in the Tamil Nadu delta districts and in specific Karnataka districts. Nagapattinam records 30.3 percent rural HP dependence, the highest in the basin, followed by Thiruvarur (18.2 percent), Dharmapuri (14.4 percent), Thanjavur (12.5 percent), and Cuddalore (11.4 percent). In Karnataka, Chamarajanagar (14.6 percent rural HP), Mysuru (10.8 percent), and Hassan (10.7 percent) record the highest rural handpump shares. In urban areas, Nagapattinam (18.2 percent) and Thiruvarur (13.4 percent) record the two highest urban handpump shares in the basin, confirming that dependence on handpumps as a primary urban supply source is specific to these delta districts rather than distributed across the basin.

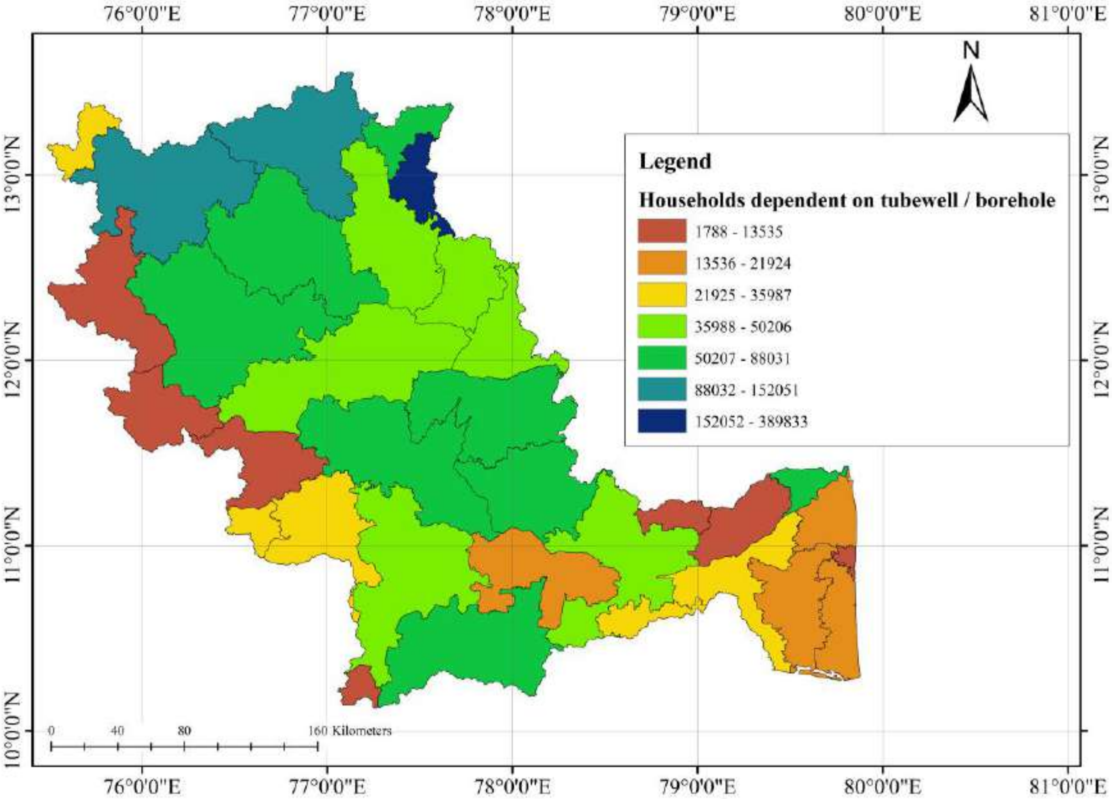

Figure 34: Distribution of Households Dependent on Tubewell / Borehole across CRB Districts

- **Tubewell and borehole (TWB)** sources are most prevalent in Karnataka's rural upper-basin districts and in the upland Tamil Nadu segment. In Karnataka, rural TWB dependence is highest in Tumakuru (28.4 percent), Bengaluru Urban (27.9 percent), and Hassan (27.8 percent). In Tamil Nadu, Erode (15.8 percent rural TWB), Namakkal (14.4 percent), Tiruppur (12.6 percent), Dharmapuri (11.5 percent), and Dindigul (11.1 percent) lead. The overlap between high rural TWB dependence and high groundwater dependency ratios for irrigation - documented for Tumkur (GDR 1.00), Dharmapuri (GDR 1.00), and Krishnagiri (GDR 0.88) - confirms that groundwater extraction for domestic use coincides spatially with intensive agricultural groundwater use in these districts.
- **Spring water** is a meaningful source only in specific physiographic settings. Idukki records the highest rural spring dependence in the basin at 16.0 percent of rural households, followed by Wayanad (4.9 percent), The Nilgiris (3.0 percent), Chikmagaluru (2.0 percent), and Kodagu (1.8 percent). All five share a Western Ghats or Nilgiris highland setting characterized by perennial spring discharge. In urban areas,

The Nilgiris (4.0 percent) and Wayanad (2.6 percent) record the highest urban spring dependence.

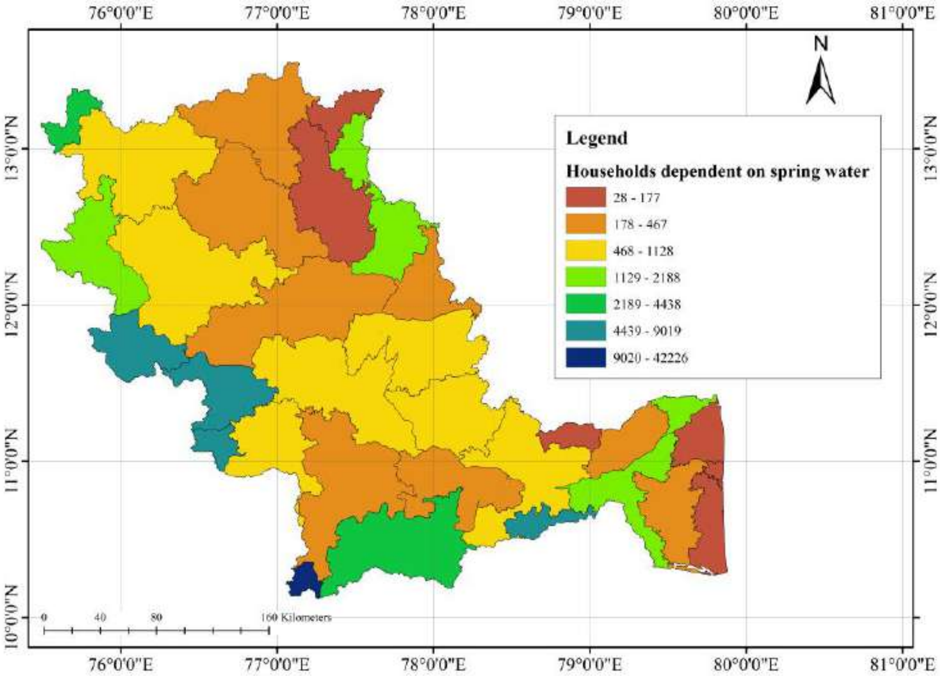

Figure 35: Distribution of Households Dependent on Spring Water across CRB Districts

- **Tank, pond, and lake (T/P/L)** sources are statistically marginal across most of the basin but register notably in Pudukkottai rural (7.0 percent of rural households) and Idukki rural (6.5 percent), consistent respectively with the district's traditional tank irrigation landscape and the high-rainfall reservoir density of the Western Ghats terrain.

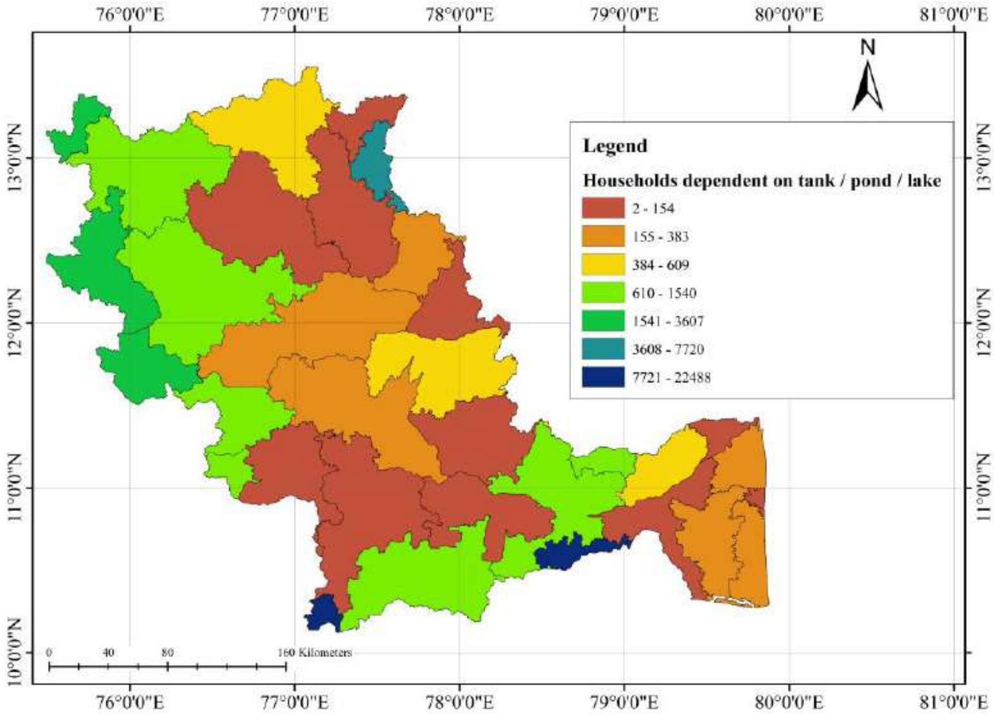

Figure 36: Distribution of Households Dependent on Tank / Pond / Lake across CRB Districts

- **River and canal (R/C)** dependence is minimal in absolute terms across the basin, with no district recording more than 1.0 percent of rural households dependent on this source as their primary drinking water supply, indicating that river and canal sources documented in the Town Directory's protected supply data do not function as primary household drinking water sources at scale in any CRB district.

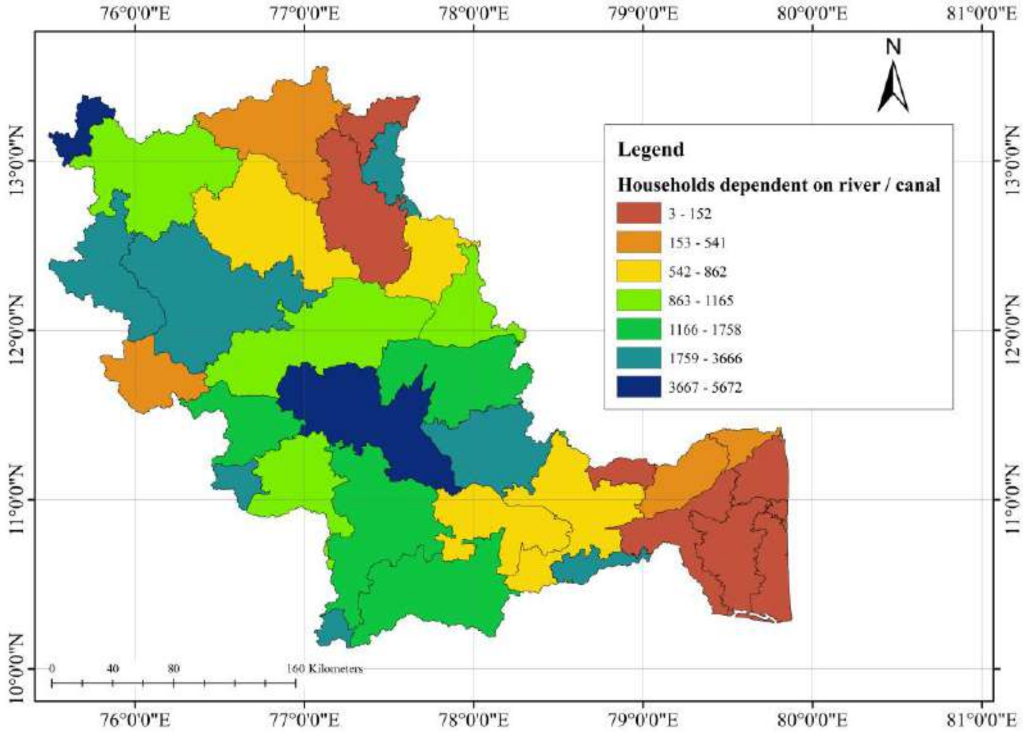

Figure 37: Distribution of Households Dependent on River / Canal across CRB Districts

- **Covered wells (CW)** show a distribution pattern broadly similar to uncovered wells but at lower absolute counts across the basin, with the Kerala segment again recording the highest values. Palakkad records the highest covered-well dependent household count in the basin at 46,246, followed by Idukki (21,669), The Nilgiris (13,180), and Wayanad (12,883). Among Karnataka districts, Kodagu (7,594) records the highest covered-well dependence, consistent with its dispersed rural settlement pattern in high-rainfall terrain where constructed wells supplement piped supply. In Tamil Nadu, Salem (8,853), Dharmapuri (5,473), and Erode (5,249) record the highest covered-well counts, while the delta districts - Thiruvarur (937), Thanjavur (1,007), and Karaikal (88) - record near-negligible values, indicating that well-based domestic supply of any type is structurally absent from the canal-dependent delta zone. The spatial distribution of covered well dependence is shown in Figure 32
- **Other sources** of drinking water, representing a residual Census catch-all category not further specified in the HH-6 documentation, show the widest absolute variation of any source category across the basin. Bengaluru Urban records the highest count at 65,221 households - more than seven times the next highest value in the basin - with Palakkad (9,094), Idukki (8,042), Bengaluru Rural (7,737), Coimbatore (7,643), and Tiruppur (6,611) forming a secondary cluster. The concentration of "other sources" dependence in a large metropolitan centre such as Bengaluru may reflect supply forms not captured under the named categories - including packaged or vended water - though the Census

definition does not permit confirmation of this interpretation. At the lower end, Karaikal (257), Thiruvarur (2,493), and Thanjavur (2,937) record the fewest households dependent on unspecified sources. The spatial distribution is shown in Figure 39.

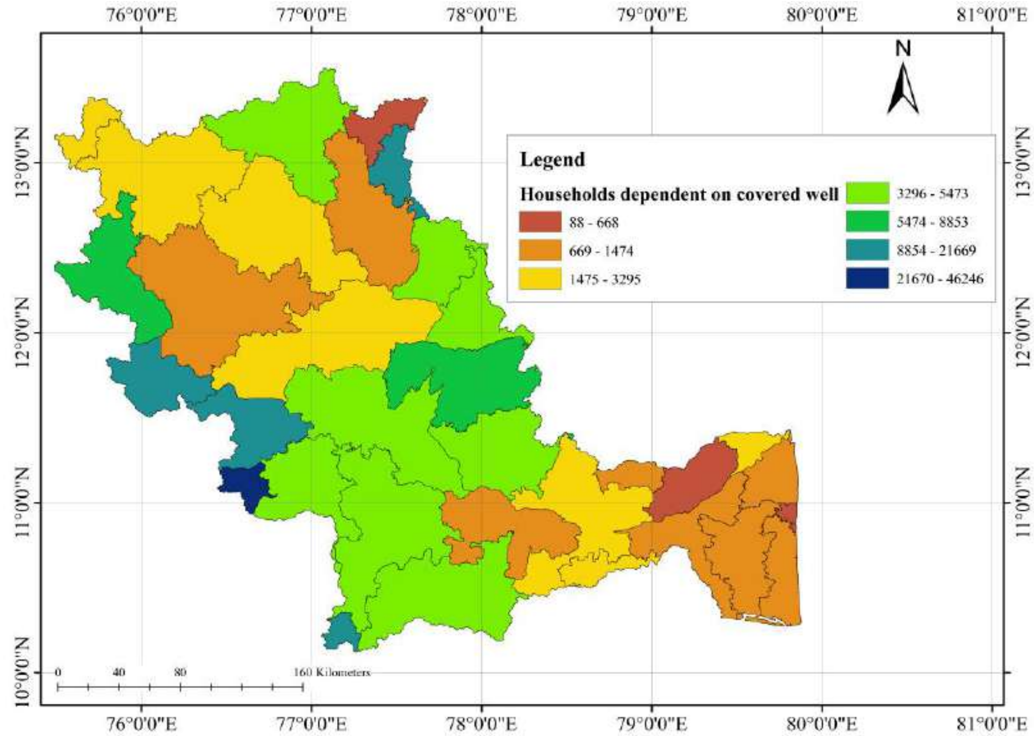

Figure 38: Distribution of Households Dependent on Covered Well across CRB Districts

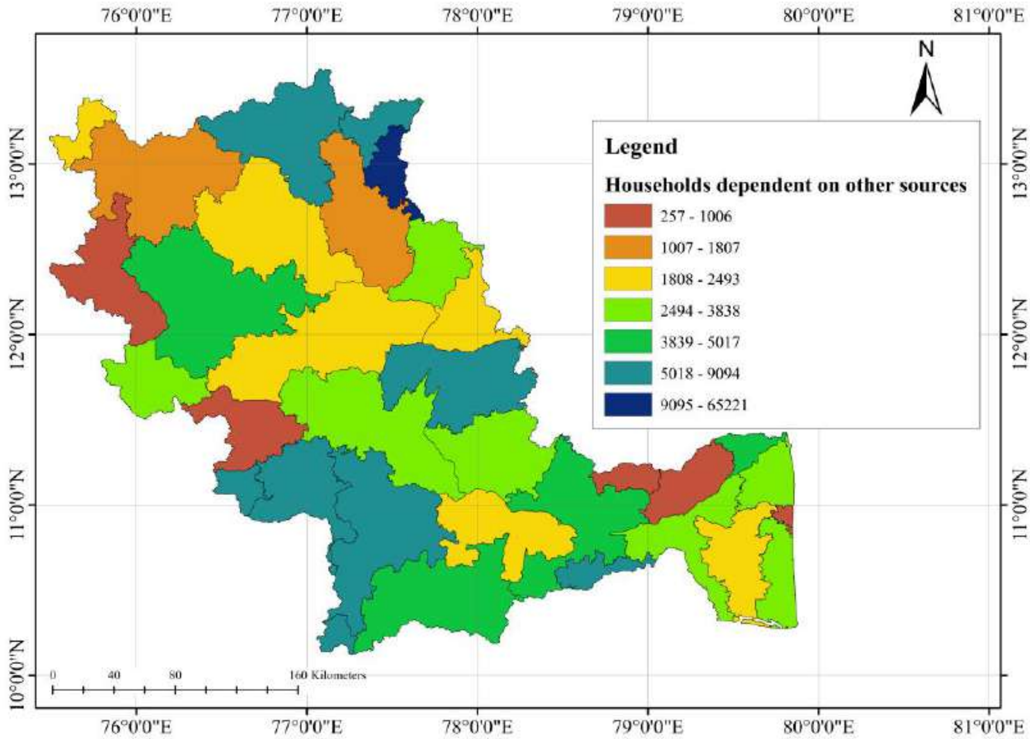

Figure 39: Distribution of Households Dependent on Other Sources across CRB Districts

7. DEMAND AND AVAILABLE SUPPLY ASSESSMENT

This chapter presents an assessment in evaluating the relationship between the projected domestic water demand and available water supply across the CRB districts. For the domestic water demand both the projected and designed supply capacity data are available for a subset of districts. For the industrial and agricultural sectors, district level supply data are irregular and are not available by which the demand – supply comparison is therefore restricted to the domestic sector, supplemented by the irrigation source dependency parameters (Groundwater dependency ratio, irrigation intensity, & PRI) which are present in Chapter 5.

7.1 Tamil Nadu

The total projected domestic water demand for the Tamil Nadu CRB districts in 2025 is approximately 1,374 MCM, comprising rural demand of approximately 480 MCM and urban demand of approximately 894 MCM across 19 districts. Against this demand, the total designed Cauvery-based drinking water abstraction capacity compiled from TWAD Board records is approximately 550 MCM per year, indicating that designed surface water infrastructure supports approximately 40 percent of the projected 2025 domestic demand. The remaining 60 percent is met through groundwater and non-Cauvery sources.

At the district level, Salem (designed supply 200.79 MCM, projected demand 152.76 MCM), Karur (115.27 MCM against 41.75 MCM), and Dharmapuri (58.37 MCM against 47.40 MCM) maintain designed Cauvery abstraction capacities exceeding their projected 2025 domestic demand. These surplus districts benefit from well-developed Cauvery-based bulk water supply schemes in the upland western portion of the basin. Ariyalur records the most acute deficit, with designed Cauvery supply of only 4.16 MCM against a projected demand of 19.91 MCM (21 percent coverage). Nagapattinam (28 percent), Perambalur (34 percent), Namakkal (53 percent), and Erode (58 percent) similarly face supply deficits where Cauvery surface water meets only a partial share of domestic requirements. Thanjavur (72 percent) and Tiruchirappalli (61 percent) fall in the moderate dependency range. Designed abstraction capacity data for the remaining nine Tamil Nadu CRB districts were not available from TWAD Board records, and their supply status cannot be evaluated within this assessment.

Irrigation source data confirms a clear spatial division between the delta and upland districts. Delta districts such as Thanjavur, Thiruvarur, and Mayiladuthurai record GDR values at or near zero, reflecting near-complete dependence on the Cauvery canal network. Upland districts such as Dharmapuri (GDR 1.00, II 1.85), Perambalur (GDR 1.00, II 1.26), and Salem (GDR 0.99, II 1.48) depend almost entirely on groundwater, with high irrigation intensities compounding seasonal extraction pressure. Districts in the transitional zone such as Cuddalore (GDR 0.67) and Pudukkottai (GDR 0.53) show a mixed source pattern. The industrial sector demand-supply comparison cannot be completed due to the absence of supply data.

7.2 Karnataka

The total projected domestic water demand for the Karnataka CRB districts in 2025 is approximately 1,263 MCM, with Bengaluru Urban including the rural part and urban part of the district, the demand accounts approximately 788 MCM, making it the single largest domestic water demand center in the entire basin. BWSSB currently supplies approximately

1,450 MLD (529 MCM per year) of Cauvery water to Bengaluru, serving approximately 12.9 million people at an average per capita consumption of 108 LPCD. The city's Cauvery allocation has been progressively increased from an initial 19 TMC to the current 29 TMC, and the proposed CWSS Stage V project (775 MLD) is intended to bridge the gap between current supply and projected 2025 demand. The deficit between projected demand (788 MCM) and current BWSSB supply (529 MCM) is approximately 259 MCM within a single city.

For the non-metropolitan KUWSDB towns within the Karnataka CRB, the total projected annual domestic requirement is approximately 1,017 MCM, while recorded Cauvery drawl during the reporting period was approximately 91.3 MCM, representing only about 9 percent of the projected requirement. This gap indicates that KUWSDB towns depend heavily on supplementary groundwater and local surface storage to meet domestic water requirements.

Irrigation source data confirms high groundwater dependency across most Karnataka CRB districts. Tumakuru (GDR 1.00), Chikkaballapura (GDR 1.00), Bengaluru Rural (GDR 1.00), and Ramanagara (GDR 1.00) record complete groundwater dependence, with canal irrigation limited to Mandya (GDR 0.54) and Mysuru (GDR 0.70). The industrial sector demand-supply comparison cannot be completed due to the absence of supply data.

7.3 Kerala

The total projected domestic water demand for the three Kerala CRB districts in 2025 is approximately 127 MCM, with Palakkad accounting for 85.49 MCM, Idukki for 23.28 MCM, and Wayanad for 18.55 MCM. Domestic water supply in these districts is derived from local river systems, reservoirs, and groundwater rather than from Cauvery mainstream transfers. No Cauvery-based designed abstraction capacity data are available for the Kerala districts, preventing a quantitative domestic demand-supply comparison for this segment.

Irrigation intensity across the three districts remains the lowest in the basin (Palakkad 1.11, Wayanad 1.13, Idukki 1.06). Palakkad records a GDR of 0.31, reflecting significant canal infrastructure, while Wayanad (GDR 0.003) depends almost entirely on other sources including rain-fed and localized surface water systems.

7.4 Karaikal

The total projected domestic water demand for Karaikal in 2025 is approximately 8.82 MCM, comprising rural demand of 2.56 MCM and urban demand of 6.26 MCM. The total annual water availability in Karaikal is estimated at 116.36 MCM, of which surface water contributes 107.37 MCM which is 92 %, and groundwater accounts for 8.99 MCM i.e. 8% of the total contribution. Given the projected domestic demand of 8.82 MCM against total availability of 116.36 MCM, Karaikal does not face an immediate volumetric domestic supply deficit. However, its GDR of 0.18 and near-complete dependence on Cauvery distributary canal flows. The designed urban supply capacity of 18.40 MLD operates at 13.5 MLD i.e. 73 percent utilization, while rural supply at 6.28 MLD against 7.64 MLD design capacity achieves 82.1 percent service coverage, indicating a gap in rural supply delivery that warrants infrastructure improvement.

8. ISSUES AND CHALLENGES

In the CRB the assessment of water demand and supply identifies the several data driven problems that are different in nature and severity across the four basin states. The following issues are identified based on the analysis presented in chapter 2 to 6, organized by state to reflect the distinct demand supply conditions prevailing in each segment of the basin.

8.1 Tamil Nadu

The domestic supply assessment reveals a pronounced spatial inequality across the ten Tamil Nadu CRB districts for which TWAD Board abstraction data are available. Designed Cauvery-based surface water capacity totals approximately 550 MCM against a projected 2025 domestic demand of approximately 1,374 MCM, covering roughly 40 % of total requirements. Salem (200.79 MCM capacity against 152.76 MCM demand) and Karur (115.27 MCM against 41.75 MCM) maintain surplus designed capacity, while Ariyalur (21 % coverage), Nagapattinam (28 %), and Perambalur (34 %) face severe deficits. The supply status of the remaining nine Tamil Nadu CRB districts cannot be evaluated due to the absence of TWAD Board records for those districts. Agricultural water demand in the delta is dominated by paddy, with Thanjavur exceeding 3,000 MCM and Thiruvarur recording 3,140 MCM in peak years. This concentrated demand is canal-dependent and tied directly to upstream reservoir releases. In the upland districts, Dharmapuri (GDR 1.00, II 1.85, PRI 0.85) and Perambalur (GDR 1.00, II 1.26, PRI 0.26) record complete groundwater dependence for irrigation, while Salem (GDR 0.99, II 1.48), Nilgiris (GDR 0.99, II 1.58), and Krishnagiri (GDR 0.88, II 1.42) similarly record high values across all three agricultural water stress parameters. The combination of high groundwater dependency with high irrigation intensity in hard-rock hydrogeological settings indicates elevated aquifer depletion risk in these districts.

Industrial water demand data for six Tamil Nadu CRB districts (Cuddalore, Nilgiris, Nagapattinam, Mayiladuthurai, Tiruppur, and Thiruvarur) were unavailable from PMKSY sources, and supply-side data for the industrial sector are entirely absent, preventing a demand-supply comparison for this sector. Tamil Nadu's 2022-2023 agricultural dataset does not include Vegetables and Fruits categories, and certain crop values reported for Nilgiris in 2019-2020 appear inconsistent with the district's plantation-dominated land use. These data limitations restrict cross-year comparability of total agricultural demand figures.

8.2 Karnataka

Bengaluru Urban's projected domestic demand of approximately 788 MCM by 2025 makes it the single largest demand center in the entire basin. BWSSB currently supplies 529 MCM per year, leaving a deficit of approximately 259 MCM within a single city. The city's Cauvery allocation, currently at 29 TMC with further augmentation proposed under CWSS Stage V (775 MLD), places direct competitive pressure on downstream users in the Tamil Nadu delta. Non-metropolitan KUWSDB towns collectively require approximately 1,017 MCM per year, of which recorded Cauvery draw covers only about 9 % (91.3 MCM), indicating heavy dependence on supplementary groundwater and local storage.

Agricultural water demand in the Karnataka segment is dominated by coconut cultivation, particularly in Tumakuru (4,406 MCM in 2019-2020), Hassan (2,635 MCM), and

Mandya (1,570 MCM). Tumakuru records the largest net irrigated area in the Karnataka segment at 277,843 ha with a GDR of 1.00, confirming complete groundwater dependence. Chikkaballapura (GDR 1.00), Bengaluru Rural (GDR 1.00), and Ramanagara (GDR 1.00) similarly record complete groundwater dependence with no canal infrastructure. Canal irrigation is limited to Mandya (GDR 0.54) and Mysuru (GDR 0.70), both supported by the Krishnarajasagara command area. Industrial water demand data for Hassan, Mysuru, Chamarajanagar, Chikkaballapura, and Chikkamagaluru were not available from PMKSY District Irrigation Plans. Supply-side data for the industrial sector is entirely absent from all Karnataka CRB districts.

8.3 Kerala

Domestic water supply in the three Kerala CRB districts (Palakkad, Idukki, Wayanad) is derived from local river systems, reservoirs, and groundwater rather than Cauvery mainstream transfers. No Cauvery-based designed abstraction capacity data are available, preventing a quantitative domestic demand-supply comparison for this segment. The projected 2025 domestic demand of approximately 127 MCM is the smallest among the four basin states.

Agricultural demand in the Kerala segment is dominated by plantation crops (coffee, tea, rubber, spices) in Idukki and Wayanad, and by coconut and paddy in Palakkad. Kerala's state-level crop classification framework does not correspond to the national nine-category framework adopted in this study, resulting in zero values for Cereals, Pulses, Sugar Crops, Vegetables, Fiber Crops, and Oilseeds across all three districts. These zero values do not indicate the absence of these crops but reflect classification non-uniformity. This limits the direct comparability of Kerala's agricultural demand figures with those of Tamil Nadu and Karnataka. Irrigation intensity across the three districts remains the lowest in the basin (1.06 to 1.13), with Palakkad (GDR 0.31) the only district with significant canal infrastructure. Wayanad (GDR 0.003) depends almost entirely on other sources (98.9% of net irrigated area), indicating that agricultural water availability in the district is contingent on localized rainfall and surface runoff.

8.4 Karaikal

Karaikal records a total annual water availability of 116.36 MCM against a projected 2025 domestic demand of 8.82 MCM, indicating no immediate volumetric deficit. However, 92 % of water availability is derived from Cauvery distributary canal flows, making the region dependent on upstream regulated releases. The designed urban supply capacity of 18.40 MLD operates at only 13.5 MLD (73 % utilization), while rural service coverage stands at 82.1 % against the urban figure of 116.5 %.

Agricultural demand is overwhelmingly paddy-driven (72.464 MCM in 2023-2024), with the GDR at 0.18 confirming high canal dependence comparable to the Tamil Nadu delta districts. The projected industrial demand for Karaikal is not reported in the PMKSY data, representing a gap that prevents any forward-looking industrial demand assessment.

8.5 Basin-Wide Data Gaps

Two data limitations affect the basin as a whole. First, supply-side data for the industrial and agricultural sectors are absent from all four states, preventing a complete demand-supply gap analysis for two of the three major water-consuming sectors. Industrial supply data disaggregated by source type need to be compiled from state pollution control boards and industrial development agencies, while agricultural supply data covering canal delivery volumes, tank storage utilization, and groundwater extraction for irrigation need to be assembled from irrigation departments and groundwater authorities. Second, the differences in crop classification frameworks between Kerala's state-level reporting and the national framework, combined with missing crop categories in Tamil Nadu's 2022-2023 dataset, limit the precision of basin-level integrated agricultural demand comparison across states and reference years.

Third, urban water supply infrastructure data exhibit uneven coverage and resolution across the basin. Water Treatment Plant (WTP) locations have been identified for ten urban centers across the Karnataka and Tamil Nadu segments, but without accompanying capacity, source-type, or commissioning-year attributes, and no WTP data are available for the Kerala or Karaikal segments. Town-level protected water supply capacity data, compiled from Census Town Directory records, are available for all four basin states, but capacity figures for secondary and tertiary sources remain largely unreported for the Tamil Nadu segment, where only the primary treated-tap source is consistently quantified. Groundwater extraction infrastructure data, including well classification by functional use, are not available in a consistent format for any of the four basin states.

8.6 Suggested Measures

For Tamil Nadu, priority expansion of designed Cauvery-based surface water capacity is required in Ariyalur, Nagapattinam, and Perambalur. In the upland districts, managed aquifer recharge programmes targeted at Dharmapuri, Perambalur, Salem, and Krishnagiri would address the convergent groundwater stress indicated by their GDR, II, and PRI values. Adoption of water-saving paddy cultivation practices in Thanjavur and Thiruvarur could yield measurable demand reductions in the delta without displacing the crop. For Karnataka, demand-side management in Bengaluru, including non-revenue water reduction and wastewater reuse for non-potable applications within the BWSSB service area, is essential to moderate the rate of demand growth. Without such measures, the continued increase in Bengaluru's Cauvery allocation will intensify pressure on downstream users. Micro-irrigation adoption for coconut in Tumakuru and Hassan would help moderate the dominant agricultural demand category in the Karnataka segment.

For Kerala, development of a crosswalk between the state-level plantation crop classification and the national framework is needed to enable accurate cross-state agricultural demand comparison. For Karaikal, improvement in rural water supply infrastructure to bridge the gap between 82.1 % current coverage and full coverage, and compilation of projected industrial demand data, are immediate priorities. Compilation of sector-specific supply data for the industrial and agricultural sectors across all four basin states remains the most critical requirement for enabling a complete basin-level demand-supply assessment.

9. CONCLUSIONS

The key findings of the water supply and demand assessment across the 34 CRB districts are summarised below. Agricultural supply data covering canal delivery volumes, tank storage utilisation, and groundwater extraction for irrigation are reported in the PMKSY District Irrigation Plans for individual districts. However, the level of detail, reporting format, reference years, and computational methodologies vary considerably across districts and states, limiting their direct comparability at the basin level. Several districts report incomplete or inconsistent supply figures that do not permit reliable aggregation into a uniform district-level format across all four basin states. A basin-level agricultural supply assessment would require standardisation of these existing DIP datasets alongside integration of Command Area Development Authority records and State Irrigation Department operational reports to achieve consistent and comparable supply accounting across all 34 CRB districts.

Total domestic demand across the basin is estimated at approximately 2,144 MCM in 2011, projected to reach 2,773 MCM by 2025. Urban demand constitutes 66 percent of this total in 2011, rising to 70 percent by 2025. Bengaluru Urban accounts for the bulk of this shift, with demand rising from 445 MCM to a projected 788 MCM, a deficit of 259 MCM against BWSSB's current supply of 529 MCM. In Tamil Nadu, designed Cauvery surface abstraction capacity of 550 MCM covers approximately 40 percent of the projected 2025 domestic demand of 1,374 MCM, with Ariyalur (21 percent), Nagapattinam (28 percent), and Perambalur (34 percent) recording the most acute supply deficits.

Industrial demand assessment remains partial. Tiruchirappalli records the highest quantified demand in Tamil Nadu at 0.596 BCM, followed by Erode (0.542 BCM) and Salem (0.216 BCM). Data for six Tamil Nadu districts and five Karnataka districts were unavailable from PMKSY sources. Supply-side data for the industrial sector are absent across all four basin states.

9.1 Data Gaps and Uncertainties

Industrial water supply disaggregated by source type is not available at the district level. State Pollution Control Boards, KIADB, and District Industries Centers hold these records and should be the primary targets for future compilation. Agricultural supply data covering canal delivery volumes, tank storage utilization, and groundwater extraction for irrigation are similarly unavailable in a consistent district-level format. Integration of Command Area Development Authority records, State Irrigation Department operational reports, and India-WRIS data is required for a comprehensive agricultural supply assessment.

Kerala's crop classification framework does not align with the national nine-category standard. Plantation crops dominating Idukki and Wayanad produce zero values for six crop categories, reflecting classification non-uniformity rather than absence of cultivation. Tamil Nadu's 2022-2023 dataset excludes Vegetables and Fruits categories, and crop values for Nilgiris in 2019-2020 appear inconsistent with the district's land use and require source verification. Groundwater dependency ratios have been computed from irrigation source data for Tamil Nadu, Karnataka, and Kerala CRB districts, but the absence of aquifer-level monitoring data (seasonal fluctuations, recharge rates, well functional status) limits interpretation of long-term extraction sustainability, particularly for districts recording GDR values of 1.00 such as Dharmapuri, Perambalur, Tumakuru, and Chikkaballapura.

Urban water supply infrastructure presents a parallel set of gaps. WTP location data are limited to ten urban centres in the Karnataka and Tamil Nadu segments, without capacity or source-type attributes, preventing any assessment of WTP capacity against domestic demand at these or any other locations in the basin. Town-level protected water supply capacity, compiled from Census Town Directory records, is available for all four basin states but is effectively limited to the treated-tap source for the Tamil Nadu segment, where capacity data for secondary sources - tubewell/borehole, handpump, covered well, and others - are absent for the great majority of towns. Groundwater extraction infrastructure data, including well classification by domestic, public-supply, observation, and agricultural use, are not available in a consistent format for any of the four basin states - a basin-wide gap rather than one limited to specific states.

9.2 Role of Stakeholders

The Cauvery Water Management Authority and State Irrigation Departments regulate reservoir releases from KRS, Kabini, Hemavathi, and Harangi that sustain canal deliveries to Thanjavur, Thiruvarur, Cuddalore, and Karaikal. Delta paddy demands exceeding 3,000 MCM per district in peak years cannot be met from any alternative source when these releases fall short.

BWSSB's projected deficit of 259 MCM by 2025 cannot be closed through supply augmentation alone without affecting downstream allocation. Non-revenue water reduction and wastewater reuse within the BWSSB network are necessary to moderate demand growth. TWAD Board and KUWSDB face a parallel challenge in districts where designed Cauvery capacity covers less than 40 percent of projected domestic demand. Farming communities in Tumakuru, Hassan, Thanjavur, and Thiruvarur, the districts recording the highest agricultural water demand in Karnataka and Tamil Nadu respectively, represent the most direct opportunity for demand reduction through adoption of micro-irrigation for coconut and water-saving rice cultivation practices in the delta. District Industries Centers and State Pollution Control Boards must begin systematic reporting of industrial water abstraction by source to enable inclusion of the industrial sector in basin-level allocation planning.

Annexure

Table 15: District-wise Crop-wise Agricultural Water Demand for Tamil Nadu CRB Districts, 2019-2020 (MCM)

DISTRICT	2019-2020								
	Water demand in MCM								
	Paddy	**Cotton**	**Oilseeds**	**Fruits**	**Cereals**	**Pulses**	**Sugarcane**	**Vegetables**	**Total**
Ariyalur	325.136	65.891	59.8455	12.112	74.349	22.014	94.996	12.112	666.4555
Coimbatore	12.054	3.227	19.3765	82.096	138.9015	24.657	10.164	91.072	381.548
Cuddalore	1850.114	40.495	79.8655	408.192	123.1605	180.171	335.456	105.824	3123.278
Dharmapuri	221.368	56.189	66.0385	103.68	288.189	161.982	23.364	533.536	1454.3465
Dindigul	113.96	56.483	19.723	133.92	356.94	61.206	39.336	149.696	931.264
Erode	483.938	8.134	133.375	144.656	91.98	18.426	281.27	213.264	1375.043
Karur	155.82	2.457	26.675	89.344	124.3125	25.611	22.484	40.08	486.7835
Krishnagiri	329.952	10.689	52.0575	11.328	217.4265	160.803	6.776	486.576	1275.608
Mayiladuthurai	-	-	-	-	-	0	-	-	0
Nagapattinam	2369.108	37.352	22.1045	172.272	0.18	209.811	5.676	6.576	2823.0795
Namakkal	147.742	21.931	185.163	51.44	377.694	40.488	222.442	415.76	1462.66
Perambalur	86.268	143.962	15.9115	320.608	262.8495	3.048	63.91	134.736	1031.293
Pudukottai	1229.326	0.399	66.7535	224.432	12.276	13.758	51.326	24.784	1623.0545
Salem	274.26	98.098	126.3075	180.112	495.045	146.316	95.502	358.544	1774.1845
Thanjavur	2691.234	14.854	72.6495	80.4	6.381	76.344	97.13	18.064	3057.0565
Nilgiris	2.38	0	0.0055	108.016	0.0405	0	0.022	87.2	197.664
Thiruvarur	2532.6	56.343	20.1465	16.736	0.099	210.954	0.528	151.056	2988.4625
Tiruchirappalli	694.722	94.318	56.21	69.312	237.06	31.098	35.376	8.864	1226.96
Tiruppur	137.886	8.442	40.9695	12.272	264.0375	234.204	53.35	108.72	859.881
Total	13657.87	719.264	1063.178	2220.928	3070.922	1620.891	1439.108	2946.464	26738.622

Table 16: District-wise Crop-wise Agricultural Water Demand for Tamil Nadu CRB Districts, 2022-2023 (MCM)

DISTRICT	**2022-2023**						
	Water demand in MCM						**Total water demand**
	Paddy	**Cereals**	**Pulses**	**Sugarcane**	**Cotton**	**Oilseeds**	
Ariyalur	366.534	86.274	26.754	96.866	59.087	79.0515	714.5665
Coimbatore	16.366	121.734	20.208	8.382	3.941	19.1455	189.7765
Cuddalore	1943.718	137.3265	164.643	350.196	42.854	81.2625	2720
Dharmapuri	390.922	240.462	167.31	92.774	41.895	91.2065	1024.57
Dindigul	189.658	340.839	45.087	41.888	37.863	28.82	684.155
Erode	434.868	88.245	18.564	432.168	11.067	128.7495	1113.662
Karur	207.872	103.7475	31.095	33.88	5.572	35.057	417.2235
Krishnagiri	426.776	195.363	146.568	9.218	11.956	82.181	872.062
Mayiladuthurai	1491.532	0.1395	147.168	9.284	48.097	7.37	1703.591
Nagapattinam	1176.574	0.027	87.384	0.066	14.196	32.219	1310.466
Namakkal	146.216	361.476	33.543	233.75	30.821	182.0005	987.8065
Perambalur	105.308	298.3905	3.768	82.016	93.023	15.7355	598.241
Pudukottai	1414.546	9.675	13.971	42.856	3.094	76.967	1561.109
Salem	340.186	506.4345	142.422	128.216	70.581	136.488	1324.328
Thanjavur	3161.718	5.049	108.126	86.57	27.608	67.969	3457.04
Nilgiris	1.274	0.0765	0	0	0	0	1.3505
Thiruvarur	3053.526	0.108	199.599	2.53	114.807	40.447	3411.017
Tiruchirappalli	955.206	211.131	30.012	41.184	90.314	49.9125	1377.76
Tiruppur	145.628	243.216	48.084	73.942	8.911	45.2265	565.0075
Total	15968.43	2949.714	1434.306	1765.786	715.687	1199.809	24033.73

Table 17: District-wise Crop-wise Agricultural Water Demand for Tamil Nadu CRB Districts, 2023-2024 (MCM)

DISTRICT	2023-2024								
	Water demand in MCM								Total water demand
	Paddy	Cereals	Pulses	Sugarcrops	Vegetables	Fruits	Fibre crops	Oilseeds	
Ariyalur	319.718	5.5755	24.216	74.734	37.104	695.288	41.972	99.1595	1297.767
Coimbatore	5.11	184.239	16.947	9.438	109.344	289.828	2.247	525.14	1142.293
Cuddalore	1998.542	156.2535	159.342	329.054	99.088	826.606	25.277	93.9345	3688.097
Dharmapuri	313.894	346.1085	172.905	95.634	703.168	358.094	35.322	120.0155	2145.141
Dindigul	191.352	220.2435	44.775	36.938	337.728	689.348	25.41	192.379	1738.1735
Erode	336.938	161.739	14.94	442.332	194.432	533.082	5.236	219.098	1907.797
Karur	123.27	162.7155	33.444	30.25	117.04	96.998	4.571	78.375	646.6635
Krishnagiri	408.562	195.003	152.658	10.23	529.12	740.344	14.175	153.1695	2203.2615
Mayiladuthurai	1505.238	0.2745	142.749	11.572	4	39.314	38.486	13.7995	1755.433
Nagapattinam	1037.876	95.6565	56.355	5.588	5.184	75.658	15.827	51.414	1343.5585
Namakkal	78.106	320.895	25.536	246.026	411.6	173.822	19.593	230.78	1506.358
Perambalur	96.642	58.7925	2.208	76.45	154.224	19.866	55.636	17.9355	481.754
Pudukottai	1342.74	323.532	13.074	42.306	29.552	222.442	1.834	140.547	2116.027
Salem	222.978	307.6425	138.207	141.394	519.936	279.466	46.235	201.586	1857.4445
Thanjavur	2936.248	234.216	53.838	57.376	22.96	150.172	23.898	312.235	3790.943
Nilgiris	1.092	4.0185	0.006	0	120.128	22.616	0	0.2915	148.152
Thiruvarur	3140.368	0.0315	113.703	5.962	11.328	21.582	110.915	106.5185	3510.408
Tiruchirappalli	623.42	120.744	15.999	37.268	182.608	230.098	67.375	74.239	1351.751
Tiruppur	114.058	248.868	49.443	64.9	157.824	147.642	6.083	473.9735	1262.7915
Total	14796.15	3146.549	1230.345	1717.452	3746.368	5612.266	540.092	3104.5905	33893.814

Table 18: District-wise Crop-wise Agricultural Water Demand for Karnataka CRB Districts, 2019-2020 (MCM)

Districts	Water demand in 2019-2020 (MCM)											
	Paddy	**Cereals without paddy**	**Small Millets**	**Pulses**	**Oil seeds**	**Coconut**	**Banana**	**Fruits**	**Vegetables**	**Cotton**	**Sugarcane**	**Total**
Bengaluru- Urban	16.968	103.059	0.552	11.703	1.2485	71.25	15.158	111.55	37.216	0.021	3.806	372.5315
Bengaluru- Rural	5.46	256.7205	0.234	9.051	1.342	78.525	25.542	257.975	59.824	0.021	3.278	697.9725
Chamarajanagar	239.624	276.678	0.9	82.479	141.0695	314.225	455.158	36.825	196.56	70.637	246.378	2060.5335
Chickballapur	13.636	447.687	1.926	32.454	141.7955	13.725	21.538	363.425	181.2	1.561	2.376	1221.3235
Chikmagalur	106.288	238.1175	11.31	6.984	11.594	1354.7	51.81	82.3	229.584	7.476	11	2111.1635
Hassan	895.244	875.8575	5.232	5.568	8.2665	2635.175	50.71	61.45	186.048	2.471	100.628	4826.65
Kodagu	46.62	8.361	0	0.045	0.0495	51.5	93.104	4.65	51.424	0	0	255.7535
Mandya	1866.256	249.2235	0.612	67.245	15.334	1570.05	67.716	67	67.36	0.007	1349.172	5319.9755
Mysuru	2342.872	489.8025	2.052	143.325	19.7065	583.3	432.674	121.2	141.104	254.653	368.808	4899.497
Ramanagaram	74.844	290.943	0.42	35.4	8.2665	739.45	55.66	786.125	13.392	0.035	9.702	2014.2375
Tumakuru	67.648	809.5545	75.42	92.145	277.651	4406.075	74.426	894.825	86.352	15.057	12.804	6811.9575
Total	5675.46	4046.004	98.658	486.399	626.3235	11817.975	1343.496	2787.325	1250.064	351.939	2107.952	30591.5955

Table 19: District-wise Crop-wise Agricultural Water Demand for Karnataka CRB Districts, 2022-2023 (MCM)

Districts	**Water demand in 2022-2023 (MCM)**											
	Paddy	**Cereals without paddy**	**Small Millets**	**Pulses**	**Oil seeds**	**Coconut**	**Banana**	**Fruits**	**Vegetables**	**Cotton**	**Sugarcane**	**Total**
Bengaluru- Urban	2.254	76.923	0.126	2.901	0.374	69.95	7.81	89.675	14.72	0.014	0.66	265.407
Bengaluru- Rural	2.73	311.9715	0.132	4.026	0.7975	71.925	15.664	229.8	53.456	0.014	3.696	694.212
Chamarajanagar	139.02	289.6605	0.78	64.509	125.8235	301.8	468.006	24.875	140.416	61.761	276.672	1893.323
Chickballapur	41.426	414.8505	0.318	15.09	108.757	11.55	23.21	354.925	379.648	3.556	2.552	1355.8825
Chikmagalur	133.056	302.886	5.946	47.013	29.2875	1811.675	46.816	48.675	244.08	26.768	4.928	2701.1305
Hassan	464.73	1049.067	1.362	84.003	25.3385	2969.8	61.336	43.3	151.376	11.137	81.334	4942.7835
Kodagu	188.258	9.3105	0	0.003	0	77.65	56.298	2.325	0.88	0	0	334.7245
Mandya	1071.308	345.348	0.012	82.95	31.7625	1581.675	71.39	57.225	94.512	0.021	1228.436	4564.6395
Mysuru	1376.746	713.376	0.234	257.457	34.3255	752.35	480.546	102.75	142.72	238.77	416.834	4516.1155
Ramanagaram	43.806	300.2445	0.234	16.632	7.876	698.975	28.732	704.875	11.952	0.007	7.876	1821.2095
Tumakuru	50.834	848.3715	5.136	179.097	293.4415	5612.675	89.54	538.25	113.856	52.759	8.91	7792.87
Total	3514.168	4662.009	14.28	753.681	657.7835	13960.025	1349.348	2196.675	1347.616	394.814	2031.898	30882.2975

Table 20: District-wise Crop-wise Agricultural Water Demand for Karnataka CRB Districts, 2023-2024 (MCM)

Districts	**Water demand in 2023-2024 (MCM)**											
	Paddy	**Cereals without paddy**	**Small Millets**	**Pulses**	**Oil seeds**	**Coconut**	**Banana**	**Fruits**	**Vegetables**	**Cotton**	**Sugarcane**	**Total**
Bengaluru- Urban	2.156	84.4965	0.096	3.564	0.2255	57.2	2.156	69.4	11.616	0.014	0.44	231.364
Bengaluru- Rural	2.058	316.1835	0.114	5.829	0.539	63.475	6.732	219.7	47.184	0	3.498	665.3125
Chamarajanagar	100.828	249.966	0.66	72.912	93.192	209.95	272.074	23	217.584	40.292	213.268	1493.726
Chickballapur	17.192	476.0145	0.234	25.62	99.5775	12	9.504	320.9	322.352	4.347	2.112	1289.853
Chikmagalur	124.922	314.9145	5.334	31.542	11.7425	1082.675	16.962	27.775	185.456	13.685	2.75	1817.758
Hassan	309.946	1081.7955	0.894	81.528	7.909	2821.025	19.954	29.175	84.016	4.62	50.424	4491.2865
Kodagu	186.27	11.3085	0	0.006	0	41.8	9.152	1.07675	5.904	0	0	255.51725
Mandya	552.958	340.812	0.006	173.646	51.7385	1513.875	26.796	37.375	114.944	0.007	1117.578	3929.7355
Mysuru	794.374	765.4545	0.084	223.995	25.1515	513.25	314.6	55.875	124.624	140.567	269.28	3227.255
Ramanagaram	41.342	324.468	0.036	25.491	9.086	579.7	8.096	636.625	7.776	0.014	4.158	1636.792
Tumakuru	35.966	841.6035	4.674	149.232	281.182	4411	33.088	494.825	95.504	33.313	7.172	6387.5595
Total	2168.012	4807.017	12.132	793.365	580.3435	11305.95	719.114	1915.72675	1216.96	236.859	1670.68	25426.15925

Table 21: District-wise Crop-wise Agricultural Water Demand for Kerala CRB Districts, 2019-2020 (MCM)

Districts	**Paddy**	**Plantation Crops**	**Cash Crops**	**Fruits**	**Tuber crops**	**Coconut**	**Bettle leaves**	**Total**
Idukki	2.772	3405.9	10.752	501.534	84.96	340.325	0	4346.243
Palakkad	346.3245	1172.3	8.816	558.342	34.065	1435.7	0.016	3555.5635
Wayanad	32.967	2273.28	19.504	464.058	18.03	243.525	0.016	3051.38
Total	382.0635	6851.48	39.072	1523.934	137.055	2019.55	0.032	10953.1865

Table 22 District-wise Crop-wise Agricultural Water Demand for Kerala CRB Districts, 2022-2023 (MCM)

Districts	**Paddy**	**Plantation Crops**	**Cash Crops**	**Fruits**	**Tuber crops**	**Coconut**	**Bettle leaves**	**Total**
Idukki	1.638	3248.4	9.552	510.714	74.835	321.225	0	4166.364
Palakkad	330.579	1201.28	7.856	614.106	17.025	1573.35	0.016	3744.212
Wayanad	34.65	2200.44	18.272	378.972	15.225	215.55	0.016	2863.125
Total	366.867	6650.12	35.68	1503.792	107.085	2110.125	0.032	10773.701

Table 23: District-wise Crop-wise Agricultural Water Demand for Kerala CRB Districts, 2023-2024 (MCM)

Districts	**Paddy**	**Plantation Crops**	**Cash Crops**	**Fruits**	**Tuber crops**	**Coconut**	**Bettle leaves**	**Total**
Idukki	1.5075	3071.92	8.784	523.53	69.555	318.775	0	3994.0715
Palakkad	289.854	1370.46	7.184	653.454	18.24	1610.25	0.016	3949.458
Wayanad	32.292	845.76	14.48	391.194	21.84	217.25	0.016	1522.832
Total	323.6535	5288.14	30.448	1568.178	109.635	2146.275	0.032	9466.3615

Table 24: District-wise Crop-wise Agricultural Water Demand for Karaikal (Puducherry) CRB District (MCM)

Year	Crops								Total
	Paddy	**Pulses**	**Banana**	**Vegetables**	**Cotton**	**Coconut**	**Oil seeds**	**Fruits**	
2019-2020	65.66	2.448	0	0.22	0.16	3.458	4.45	0.3245	77.4705
2022-2023	73.01	18.045	0	0.198	0.096	2.758	4.05	0.2035	98.9605
2023-2024	72.464	1.359	0	0.198	0.032	7.154	4	0.7095	86.4665

Table 25: Total Agricultural Water demand for the CRB

State	2019-2020	2022-2023	2023-2024
Tamil Nadu	26738.622	24033.7295	33893.814
Karnataka	30591.5955	30882.2975	25426.15925
Kerala	10953.1865	10773.701	9466.3615
Karaikal	77.4705	98.9605	86.4665

Note : The total agricultural water demand values for the three reference years are not directly comparable due to differences in crop category coverage across years. For Tamil Nadu, Vegetables and Fruits data were not available from the DES source for 2022-2023. For Kerala, crop categories such as Cereals, Pulses, Sugar Crops, Vegetables, Fibre Crops, and Oilseeds record zero values due to differences between Kerala's state-level crop classification and the national framework adopted in this study. Comparisons across years should therefore be limited to crop categories that are consistently reported across all three reference years. Comparisons across years should therefore be limited to crop categories that are consistently reported across all three reference years.

Table 26: Net Area Irrigated (Source Wise) in Each District in CRB of Tamil Nadu for The Year 2023-2024 (Hectare)

District	Net Irrigated Area								
	Canal			Tank	Well			Other Source	Total
	Government	Private	Total		Tubewell	Other Well	Total		
Ariyalur	1926	101	2027	1180	34382	2447	36829	0	40036
Chennai	0	0	0	61	222	1	223	0	284
Coimbatore	15195	0	15195	0	37607	66063	103670	52	118917
Cuddalore	43134	250	43384	2484	84980	8743	93723	0	139591
Dharmapuri	0	0	0	0	0	57512	57512	0	57512
Dindigul	5202	0	5202	4543	18081	70503	88584	1475	99804
Erode	48043	0	48043	0	15787	53928	69715	0	117758
Karur	4336	0	4336	0	15028	22698	37726	0	42062
Krishnagiri	566	0	566	7639	27353	35112	62465	0	70670
Mayiladuthurai	67969	0	67969	0	0	0	0	0	67969
Nagapattinam	49222	0	49222	0	0	0	0	1146	50368
Namakkal	5323	0	5323	0	12156	53724	65880	1626	72829
Perambalur	0	0	0	0	2666	22572	25238	0	25238
Pudukkottai	915	0	915	54293	49128	14097	63225	29	118462
Salem	806	0	806	0	13340	104802	118142	0	118948
Thanjavur	114177	1	114178	0	65483	0	65483	0	179661
Nilgiris	0	0	0	0	0	5112	5112	74	5186
Thiruvarur	147167	0	147167	0	0	0	0	0	147167
Tiruchirappalli	14334	0	14334	2310	9673	39099	48772	0	65416
Tiruppur	29275	553	29828	1173	16121	85434	101555	0	132556

Table 27: Gross Area Irrigated (Source Wise) in Each District in CRB of Tamil Nadu for The Year 2023-2024 (Hectare)

District	Gross Irrigated Area									Groundwater dependency	Irrigation Intensity	Proportion under Repeated Irrigation (PRI)
	Canal			Tank	Well			Other Source	Total			
	Government	Private	Total		Tubewell	Other Well	Total					
Ariyalur	2182	101	2283	1216	46119	2613	48732	0	52231	0.9199	1.3046	0.3046
Chennai	0	0	0	61	237	1	238	0	299	0.7852	1.0528	0.0528
Coimbatore	15208	0	15208	0	38679	68911	107590	52	122850	0.8718	1.0331	0.0331
Cuddalore	54905	401	55306	3641	126749	9216	135965	0	194912	0.6714	1.3963	0.3963
Dharmapuri	0	0	0	0	7	106299	106306	0	106306	1	1.8484	0.8484
Dindigul	5632	0	5632	4608	18378	72751	91129	1505	102874	0.8876	1.0308	0.0308
Erode	54515	0	54515	0	16899	60954	77853	0	132368	0.592	1.1241	0.1241
Karur	4448	0	4448	0	15956	24389	40345	0	44793	0.8969	1.0649	0.0649
Krishnagiri	570	0	570	8727	41495	49399	90894	0	100191	0.8839	1.4177	0.4177
Mayiladuthurai	115680	0	115680	0	0	0	0	0	115680	0	1.702	0.702
Nagapattinam	76223	0	76223	0	0	0	0	1604	77827	0	1.5452	0.5452
Namakkal	6136	0	6136	0	15123	78372	93495	2405	102036	0.9046	1.401	0.401
Perambalur	0	0	0	0	2734	29091	31825	0	31825	1	1.261	0.261
Pudukkottai	915	0	915	54991	57518	15608	73126	29	129061	0.5337	1.0895	0.0895
Salem	1046	0	1046	0	20606	154262	174868	0	175914	0.9932	1.4789	0.4789
Thanjavur	175943	1	175944	0	112773	0	112773	0	288717	0.3645	1.607	0.607
Nilgiris	0	0	0	0	6	8111	8117	62	8179	0.9857	1.5771	0.5771
Thiruvarur	248790	0	248790	0	2	0	2	0	248792	0	1.6905	0.6905
Tiruchirappalli	18416	0	18416	2549	13148	47524	60672	0	81637	0.7456	1.248	0.248
Tiruppur	29275	553	29828	1173	16354	87455	103809	0	134810	0.7661	1.017	0.017

Table 28: Net Area Irrigated (Source Wise) in Each District in CRB of Karnataka for The Year 2024-2025 (Hectare)

District	Net Irrigated Area								
	Canal			Tank	Well			Other Source	Total
	Government	Private	Total		Tubewell	Other Well	Total		
Bengaluru rural	-	-	-	-	27163	-	27163	-	27163
Bengaluru urban	-	-	-	-	10622	-	10622	2	10624
Chamarajanagar	8695	-	8695	3	72837	3417	76254	2	84954
Chickballapur	6	-	6	3	67593	-	67593	17	67619
Chikmagalur	7066	-	7066	6344	60930	-	60930	61151	135491
Hassan	18144	-	18144	8354	111155	191	111346	83	137927
Kodagu	975	-	975	-	68	-	68	43	1086
Mandya	73757	-	73757	4453	64745	28304	93049	301	171560
Mysuru	50806	-	50806	2574	127598	-	127598	145	181123
Ramanagara	-	-	-	155	36856	-	36856	-	37011
Tumkur	-	-	-	-	275252	609	275861	-	275861

Table 29: Gross Area Irrigated (Source Wise) in Each District in CRB of Karnataka for The Year 2024-2025 (Hectare)

District	Gross Irrigated Area									Groundwater Dependency Ratio (GDR)	Irrigation Intensity (II)	Proportion under Repeated Irrigation (PRI)
	Canal			Tank	Well			Other Source	Total			
	Government	Private	Total		Tubewell	Other Well	Total					
Bengaluru rural	-	-	-	-	31726	-	31726	-	31726	1	1.168	0.168
Bengaluru urban	-	-	-	-	10622	-	10622	2	10624	0.9998	1	0
Chamarajanagar	10309	-	10309	3	90498	4442	94940	2	105254	0.8976	1.239	0.239
Chickballapur	6	-	6	3	88978	-	88978	30	89017	0.9996	1.3164	0.3164
Chikmagalur	7377	-	7377	6344	61630	-	61630	61159	136510	0.4497	1.0075	0.0075
Hassan	22496	-	22496	9025	146502	191	146693	103	178317	0.8073	1.2928	0.2928
Kodagu	975	-	975	-	68	-	68	43	1086	0.0626	1	0
Mandya	101562	-	101562	6139	82966	44098	127064	430	235195	0.5424	1.3709	0.3709
Mysuru	64946	-	64946	2585	180307	-	180307	174	248012	0.7045	1.3693	0.3693
Ramanagara	-	-	-	155	40583	-	40583	-	40738	0.9958	1.1007	0.1007
Tumkur	-	-	-	-	277216	627	277843	-	277843	1	1.0072	0.0072

Table 30: Net Area Irrigated (Source Wise) in Each District in CRB of Kerala for The Year 2024-2025 (Hectare)

Sl. No.	District	Net Irrigated Area								
		Canal			Tank	Well			Other Source	Total
		Government	Private	Total		Tubewell	Other Well	Total		
1	Idukki	1308	-	1308	26606.37	19169	8876	28045	12204.94	68164.43
2	Palakkad	36412	-	36412	3682.82	13993	11243	25236	15842.84	81174.22
3	Wayanad	-	-	-	121.88	1	53	54	16397.94	16574.21

Table 31: Gross Area Irrigated (Source Wise) in Each District in CRB of Kerala for The Year 2024-2025 (Hectare)

Sl. No.	District	Gross Irrigated Area									Groundwater dependency ratio	Irrigation intensity	Proportions under Repeated Irrigation
		Canal			Tank	Well			Other Source	Total			
		Government	Private	Total		Tubewell	Other Well	Total					
1	Idukki	1385	-	1385	28178.46	20302	9401	29702	12926.09	72192.05	0.4114	1.0591	0.0591
2	Palakkad	40400	-	40400	4086.18	15526	12475	28001	17578.03	90064.83	0.3109	1.1095	0.1095
3	Wayanad	-	-	-	137.34	1	60	61	18478	18676.63	0.0033	1.1268	0.1268

Table 32: Net Area Irrigated (Source Wise) in Each District in CRB of Puducherry for The Year 2024-2025 (Hectare)

District	Net Irrigated Area								
	Canal			Tank	Well			Other Source	Total
	Government	Private	Total		Tubewell	Other Well	Total		
Karaikal	4092	-	4092	-	880	-	880	10	4982

Table 33: Gross Area Irrigated (Source Wise) in Each District in CRB of Puducherry for The Year 2024-2025 (Hectare)

District	Gross Irrigated Area									Groundwater Dependency Ratio (GDR)	Irrigation Intensity (II)	Proportion under Repeated Irrigation (PRI)
	Canal			Tank	Well			Other Source	Total			
	Government	Private	Total		Tubewell	Other Well	Total					
Karaikal	4092	-	4092	-	1669	-	1669	10	5771	0.1766	1.1584	0.1584

Table 34: Major/Medium irrigation projects in Cauvery River Basin (Source : India WRIS)

Name of Project	Type	River	Tributary	Status	Year of completion	Ultimate Irrigation Potential	Districts Benefitted
Amaravathy Medium Irrigation Project	Medium	Amaravati	Amaravathy	Completed	1958	8.7	Coimbatore, Erode
Arkavathi Medium Irrigation Project	Medium	Arkavathy	Arkavathy	Completed	NA	6.23	Bengaluru
Badanavalu Medium Irrigation Project	Medium	NA	NA	Ongoing	NA	3.27	Mysuru
Banahalli Hundi Lift Irrigation Project	Medium	NA	Kabini River	Completed	NA	1.77	Mysuru
Banasurasagar Medium Irrigation Project	Medium	Kabini	Panamaram	Ongoing	NA	4.8	Wayanad
Byramangala Medium Irrigation Project	Medium	Vrishabavathy	Vrishabhavathy	Completed	1945	2.23	Bengaluru
Cauvery Anicut Channels Major Irrigation Project	Major	NA	Cauvery	Completed	1900	77.17	Bengaluru, Hassan, Kodagu, Mandya, Mysuru
Cauvery Delta Major Irrigation Project Puducherry	Major	NA	Cauvery	Completed		18	Karaikal
Cauvery Delta Major Irrigation Project, Tamil Nadu	Major	Cauvery	Cauvery	Completed	1889	504.64	Thanjavur, Karaikal
Cauvery Mettur Major Irrigation project	Major	Cauvery	Cauvery	Completed	1934	111.7	Thanjavur, Pudukkottai

Chickahole Medium Irrigation Project	Medium	Chickkahole	Chickkahole	Completed	1969	NA	Mysuru
Chiklihole Medium Irrigation Project	Medium	Chiklihole	Chiklihole	Completed	NA	1.18	Kodagu
Chinnar Medium Irrigation Project	Medium	Cauvery	Chinnar	Completed	1977	NA	Dharmapuri
Gundal Medium Irrigation Project	Medium	Gundal	Gundal	Completed	1980	4.05	Mysuru
Gunderipallam Medium Irrigation Project	Medium	Gunderipallam	Cauvery	Completed	1978	NA	Erode
Harangi Major Irrigation Project	Major	Harangi	Harangi	Completed	NA	54.59	Kodapu, Hassan, Mysuru
Hebballa Medium Irrigation Project	Medium	Hebbahalla	Hebballa	Completed	1972	NA	Mysuru
Hemavathy Major Irrigation Project	Major	Hemavathy	Hemavathy	Completed	NA	283.6	Hassan, Mandya, Tumkur
Hucchana - Koppalu Medium Irrigation Project	Medium	Gandorinala	Hemavathy	Completed	NA	3.36	Hassan
Iggalur Medium Irrigation Project	Medium	Shimsha	Shimsha	Completed	1996	4.05	Bengaluru, Mandya
Kabini Major Irrigation Project	Major	Kabini	Kabini	Completed	NA	87.9	Mysuru

Kachnahalli Lift Irrigation Project	Medium	NA	Hemavathy	Ongoing	NA	3.48	Hassan
Kalingarayan Major Irrigation Project	Major	Cauvery / Bhavani	Bhavani	Completed	1893	NA	Erode
Kama Samundra Lift Irrigation Project	Medium	Hemavathy	Hemavathi	Completed	NA	5.13	Hassan
Kanva Medium Irrigation Project	Medium	Kanva	Kanva	Completed	1946	2.58	Benagaluru
Karapuzha Medium Irrigation Project	Medium	Panamaram	Karampuzha	Ongoing	NA	9.87	Wayanad
Kattalai Major Irrigation Project	Major	Cauvery	Cauvery	Completed	1926	NA	Tiruchirappalli, Thanjavur
Kodaganar Medium Irrigation Project	Medium	Kodaganar	Kodaganar	Completed	NA	NA	Dindigul
Kodivery Anicut System Major Irrigation Project	Major	Bhavani	Bhavani	Completed	1894	19.83	Erode
Krishnaraja Sagar Major Irrigation Project	Major	Cauvery	Cauvery	Completed	1931	79.31	Mandya, Mysuru
Kuthiraiyar Medium Irrigation Project	Medium	Kuthiraiyar	Cauvery	Completed	1990	NA	Dindigul
Lower Bhavani Major Irrigation Project	Major	Cauvery	Bhavani	Completed	1955	83.77	Erode, Tiruchirappalli
Lower Coleroon Anicut Major Irrigation Project	Major	Cauvery	Coleroon	Completed	1903	NA	Cuddalore, Thanjavur

Manchanabele Medium Irri. Project	Medium	Arkavathy	Arkavathy	Completed	NA	2.43	Bengaluru
Mangala Medium Irrigation Project	Medium	Naginihalla	Cauvery	Completed	1970	NA	Tumakuru
Marcona halli Medium Irrigation Project	Medium	Shimsha	Shimsha Valley	Completed	1941	5.94	Tumakuru
Mettur Canal Major Irrigation Project	Major	Cauvery	Cauvery	Completed	NA	18.21	Salem, Erode
Nallur Amanikere Medium Irrigation Project	Medium	Gundlu	Gundlu	Completed	NA	NA	Mysuru
Nandhiyar Channel Medium Irrigation Project	Medium	Cauvery	Nandhiyarc	Completed	1899	2.97	Tiruchirappalli
Nanganjiar Medium Irrigation Project	Medium	Cauvery	NA	Ongoing	NA	2.55	Dindigul, Karur, Amaravathy
Nanjapura Medium Irrigation Project	Medium	NA	Cauvery	Completed	NA	4.41	Mysuru
Noyyal Medium Irrigation Project	Medium	Cauvery	NA	Completed	NA	4.2	Erode
Nugu Medium Irrigation Project	Medium	Nugu	Nugu	Completed	NA	NA	Mysuru
Orathupalayam Medium Irrigation Project	Medium	NA	Amaravathy	Completed	NA	NA	Erode

Palar Porandalar Medium Irrigation Project	Medium	Palar Porandalar	NA	Completed	1978	4.08	Dindigul
Parappalar Medium Irrigation Project	Medium	Parapallar	NA	Completed	1974	NA	Dindigul
Ponnaniar Medium Irrigation Project	Medium	Ponnaniar	Cauvery	Completed	1974	NA	Tiruchirappalli
Pullambadi Canal Medium Irrigation Project	Medium	Cauvery	Penniyar	Completed	NA	8.94	Tiruchirappalli
Siddhamalli Medium Irrigation Project	Medium	Siddhamalli	Cauvery	Completed	1987	1.7	Tiruchirappalli
Suvarnavathy Medium Irrigation Project	Medium	Suvarnavathy	NA	Completed	1984	NA	Mysuru
Taraka Medium Irrigation Project	Medium	Taraka	Taraka	Completed		7.04	Mysuru
Thoppaiyar Medium Irrigation Project	Medium	Thoppaiyar	NA	Completed	1986	4.31	Dharmapuri
Uduthore Halla Medium Irrigation Project	Medium	Uduthore Halla	Uduthore Halla	Completed		6.6	Mysuru
Varattupallam Medium Irrigation Project	Medium	Varattupallam	Cauvery	Completed	1978	NA	Erode
Vattamalai Karai Odai Medium Irrigation Project	Medium	Vattamalai kari	Cauvery	Completed	1978	1.2	Erode
Votehole Medium Irrigation Project	Medium	Votehole	Votehole	Completed	NA	7.49	Hassan
Yagachi Major Irrigation Project	Major	Yagachi	Yagachi	Ongoing	NA	21.45	Hassan

Table 35: List of Barrage / Weirs / Anicuts (Source : India WRIS)

Name of Barrage / Weirs / Anicuts	Latitude	Longitude	District	State	River	Type
Muthur Barrage	11.07	77.75528	Erode	Tamil Nadu	Noyal	Barrage
Danagere Anicut	12.26773	77.16768	Mandya	Karnataka	Cauvery	Anicut
Siva balancing Reservoir	12.29032	77.15669	Mandya	Karnataka	Cauvery	Reservoir
Netkal Balancing Reservoir	12.3385	77.15986	Mandya	Karnataka	Cauvery	Reservoir
Upper Bhavani Lower Diversion Weir	11.22213	76.52055	The Nilgiris	Tamil Nadu	Cauvery	Weir
Niralapallam Weir	11.28125	76.76696	The Nilgiris	Tamil Nadu	Cauvery	Weir
Upper Anicut	10.88653	78.57965	Tiruchirappalli	Tamil Nadu	Cauvery	Anicut
Kalingarayan Anicut	11.44261	77.67689	Erode	Tamil Nadu	Bhavani	Anicut
Lower Colleron Anicut	11.14365	79.45052	Ariyalur	Tamil Nadu	Colleron	Anicut
Kattalai Bed Regulator	10.95948	78.23371	Karur	Tamil Nadu	Cauvery	Others
Urachikottar Barrage	11.48424	77.70413	Erode	Tamil Nadu	Cauvery	Barrage
Chekkanur Barrage	11.72734	77.7812	Salem	Tamil Nadu	Cauvery	Barrage
Nerunjipettai Barrage	11.64302	77.7582	Erode	Tamil Nadu	Cauvery	Barrage
Koneripatti Barrage	11.57613	77.74308	Erode	Tamil Nadu	Cauvery	Barrage
Grand Anicut	10.83065	78.81888	Thanjavur	Tamil Nadu	Cauvery	Anicut
Bhavani Kattalai Barrage - I	11.38401	77.71415	Namakkal	Tamil Nadu	Bhavani	Barrage
Bhavani Kattalai Barrage - II	11.33199	77.75864	Erode	Tamil Nadu	Bhavani	Barrage
Bhavani Kattalai Barrage - III	11.24259	77.86425	Namakkal	Tamil Nadu	Bhavani	Barrage
Chikka Devaraya Sagar Anicut	12.42244	76.59478	Mandya	Karnataka	Cauvery	Anicut
Devaraya Anicut	12.41852	76.59395	Mandya	Karnataka	Cauvery	Anicut
Virija Anicut	12.41298	76.6062	Mandya	Karnataka	Cauvery	Anicut
Bangaradoddy Anicut	12.42677	76.66294	Mandya	Karnataka	Cauvery	Anicut
Rajaparameshwari Anicut	12.3807	76.79051	Mandya	Karnataka	Cauvery	Anicut
Ramaswamy Anicut	12.38775	76.78949	Mandya	Karnataka	Cauvery	Anicut
Madhavamatri Anicut	12.21086	77.02364	Mysuru	Karnataka	Cauvery	Anicut

Kodiveri Anicut	11.47314	77.29651	Erode	Tamil Nadu		Anicut
Kattery Weir	11.33839	76.73708	Nilgiris	Tamil Nadu		Weir
Aravakurichri Anicut	10.65215	77.85062	Karur	Tamil Nadu	Nanganji	Anicut
Gujjarahalli Small Anicut	12.36994	78.00577	Dharmapuri	Tamil Nadu	Chinnar	Anicut
Gujjaramalli Big Anicut	12.34464	78.01042	Dharmapuri	Tamil Nadu	Chinnar	Anicut
Javvathupatti Anicut	10.56189	77.80538	Dindigul	Tamil Nadu	Parapalar	Anicut
Kadathur Anicut	10.55855	77.3733	Tiruppur	Tamil Nadu		Anicut
Kaldurai Anicut	10.60109	77.49485	Dindigul	Tamil Nadu	Shanmukha Nadi	Anicut
Kallakattu Anicut	10.42962	77.50886	Dindigul	Tamil Nadu	Varattar	Anicut
Kaniyur Anicut	10.55961	77.3742	Tiruppur	Tamil Nadu	Amaravathy	Anicut
Karatholuvu anicut	10.58494	77.38299	Tiruppur	Tamil Nadu	Amaravathy	Anicut
Keeranur Anicut	10.56608	77.48839	Dindigul	Tamil Nadu	Shanmukha Nadi	Anicut
Koraiyulhu Anicut	10.60491	77.84031	Dindigul	Tamil Nadu	Nanganji	Anicut
Korikadavu Anicut	10.47684	77.48884	Dindigul	Tamil Nadu	Shanmukha Nadi	Anicut
Kothai Anicut	10.40952	77.54383	Dindigul	Tamil Nadu	Varattar	Anicut
Kumaralingam anicut	10.44778	77.30488	Tiruppur	Tamil Nadu	Amaravathy	Anicut
Marandahalli Anicut	12.38981	77.99041	Dharmapuri	Tamil Nadu	Chinnar	Anicut
Muthukulam Anicut	10.44921	77.3856	Dindigul	Tamil Nadu	Kuthiraiyar	Anicut
Oddanai Anicut	10.64145	77.84872	Karur	Tamil Nadu	Nanganji	Anicut
Panchapalli Anicut	12.47693	77.93159	Dharmapuri	Tamil Nadu	Chinnar	Anicut
Panjanthangi Anicut	10.40466	77.38509	Dindigul	Tamil Nadu	Kuthiraiyar	Anicut
Periyakulam Anicut	10.53898	77.77445	Dindigul	Tamil Nadu	Parapalar	Anicut
Pullambadi Head Sluice	10.89955	78.58153	Tiruchirappalli	Tamil Nadu	Aiyar	Others
Ramasmuthiram Anicut	10.50413	77.7313	Dindigul	Tamil Nadu	Parapalar	Anicut
Sakkilian Anicut	10.38749	77.54748	Dindigul	Tamil Nadu	Varattar	Anicut
Sarkar Kannadi Puthur Anicut	10.50242	77.36293	Tiruppur	Tamil Nadu	Amaravathy	Anicut
Sembakulam Anicut	10.42897	77.3894	Dindigul	Tamil Nadu	Kuthiraiyar	Anicut
Sholamdevi Anicut	10.5397	77.36937	Dindigul	Tamil Nadu	Amaravathy	Anicut
Thevadiakulam Anicut	10.46297	77.38469	Tiruppur	Tamil Nadu	Kundiraiyar	Anicut
Uppuchetti Anicut	10.4334	77.50341	Dindigul	Tamil Nadu	Varattar	Anicut

Viranam Eri	11.298	79.54777	Cuddalore	Tamil Nadu	Coleroon	Others
Jadarpalayam	11.15944	77.88192	Namakkal	Tamil Nadu	Cauvery	Others
Sangaraino Nellore	10.48343	77.36534	Tiruppur	Tamil Nadu	Kundiraiyar	Others
Sri Ramadevra Anicut	12.81261	76.1962	Hassan	Karnataka	Hemavati River	Anicut
Hullhalli Anicut	12.10939	76.5373	Mysuru	Karnataka	Kabani	Anicut
Halsur Anicut	11.98585	76.45871	Mysuru	Karnataka	Nugu	Anicut
Cauvery Anicut III	12.50727	76.28998	Mysuru	Karnataka	Cauvery	Anicut
Cauvery Anicut II	12.52119	76.24017	Mysuru	Karnataka	Cauvery	Anicut
Cauvery Anicut I	12.60671	76.04575	Hassan	Karnataka	Cauvery	Anicut
Mandagere Weir	12.73282	76.37612	Mandya	Karnataka	Hemavati River	Weir
Hemagiri Weir	12.66033	76.41057	Mandya	Karnataka	Hemavati River	Weir
Haluvagilu Weir	12.96594	76.05851	Hassan	Karnataka	Yagachi River	Weir
Chandranahalli Weir	12.82388	76.90969	Mandya	Karnataka	Cauvery	Weir
Upla Ane Weir	12.86445	76.89152	Mandya	Karnataka	Cauvery	Weir
Alangium Anicut	10.63043	77.44362	Tiruppur	Tamil Nadu	Amaravathy	Anicut
Dhalavaipattinam Anicut	10.63676	77.45041	Tiruppur	Tamil Nadu	Amaravathy	Anicut
Dharapuram Anicut	10.6558	77.47654	Tiruppur	Tamil Nadu	Amaravathy	Anicut
Kolinjivadi Anicut	10.68439	77.51534	Tiruppur	Tamil Nadu	Amaravathy	Anicut
Nanjaithalayur Anicut	10.73295	77.53819	Tiruppur	Tamil Nadu	Amaravathy	Anicut
Chinna Dharapuram Anicut	10.77506	77.54874	Tiruppur	Tamil Nadu	Amaravathy	Anicut
Sundakkampalayam Anicut	10.78417	77.53976	Tiruppur	Tamil Nadu	Amaravathy	Anicut
Nanjakkalakurichi Anicut	10.79256	77.53896	Tiruppur	Tamil Nadu	Amaravathy	Anicut
Siriyurunala	12.36412	76.35122	Mysuru	Karnataka	Lakshmantirtha	Others
Kiranguru Weir	12.23452	76.19524	Mysuru	Karnataka	Lakshmantirtha	Weir
Iggalur Barrage	12.47433	77.13389	Mandya	Karnataka	Shimsha	Barrage
Shimsha Barrage	12.71457	76.99786	Mandya	Karnataka	Shimsha	Barrage

Table 36: List of Dams in CRB (Source : India WRIS)

Name of the Dam	State	District	Purpose
Thonnur Tank	Karnataka	Mandya	Multi-purpose
Maidal Amanikere Tank	Karnataka	Tumakuru	Irrigation
Hesaraghatta Reservoir	Karnataka	Bengaluru Urban	Water Supply
Deepambudikere Tank	Karnataka	Tumakuru	Irrigation
Kadaba Tank	Karnataka	Tumakuru	Irrigation
Nidasale Tank	Karnataka	Tumakuru	Irrigation
Nittur Tank	Karnataka	Tumakuru	Irrigation
K.R.Sagara Dam	Karnataka	Mandya	Multi-purpose
Doddaladahalli Tank	Karnataka	Ramanagara	Irrigation
Maralvadi Dam	Karnataka	Ramanagara	Irrigation
Markonahalli Dam	Karnataka	Tumakuru	Irrigation & Fishing
Nelligudda Tank	Karnataka	Ramanagara	Irrigation
Byramangala Tank	Karnataka	Ramanagara	Irrigation
Kanva Dam	Karnataka	Ramanagara	Irrigation
K.Honnamachanahally	Karnataka	Tumakuru	Irrigation
Chikkahole dam	Karnataka	Chamarajanagar	Irrigation
Nugu Dam	Karnataka	Mysuru	Irrigation & Hydroelectric
Hebballa Dam	Karnataka	Mysuru	Irrigation & Fishing
Bellathasanahalla Tank	Karnataka	Chamarajanagar	Irrigation & Fishing
Kalikatte Tank	Karnataka	Chamarajanagar	Irrigation
Mangala Tank	Karnataka	Chamarajanagar	Irrigation
Chakena Hally Tank	Karnataka	Hassan	Irrigation
Mutthurayanakere	Karnataka	Tumakuru	Irrigation
Karimuddenahalli Tank	Karnataka	Mysuru	Irrigation
Kachavanahalli Tank	Karnataka	Mysuru	Irrigation & Fishing
Kabini Dam	Karnataka	Mysuru	Multi-purpose

Chikkagondanahally Tank	Karnataka	Ramanagara	Irrigation & Fishing
Hemavathy Dam	Karnataka	Hassan	Multi-purpose
Gundal Dam	Karnataka	Chamarajanagar	Irrigation
Harangi Dam	Karnataka	Kodagu	Hydroelectric
Alalur Tank	Karnataka	Mysuru	Irrigation & Fishing
Gowdahalli Tank	Karnataka	Chamarajanagar	Irrigation
New Tank Amachawadi	Karnataka	Chamarajanagar	Irrigation
Suvarnavathy Dam	Karnataka	Chamarajanagar	Irrigation
Taraka Dam	Karnataka	Mysuru	Irrigation
Votehole Dam	Karnataka	Hassan	Irrigation
Hosahalli Tank	Karnataka	Chamarajanagar	Irrigation
Nalluru Amanikere Dam	Karnataka	Chamarajanagar	Irrigation
Alagapura Tank	Karnataka	Chamarajanagar	Irrigation
Gopinatham Tank	Karnataka	Chamarajanagar	Irrigation & Fishing
Obichudanahalli Tank	Karnataka	Bengaluru Urban	Irrigation
Manchanabele	Karnataka	Ramanagara	Irrigation
Iggalur Dam	Karnataka	Ramanagara	Irrigation
Yagachi Dam	Karnataka	Hassan	Irrigation & Water Supply
Arkavathy Dam	Karnataka	Ramanagara	Irrigation
Kowlihalla Tank	Karnataka	Chamarajanagar	Irrigation & Fishing
Mallaghatta Tank	Karnataka	Tumakuru	Irrigation, Water Supply & Fishing
Mayasandra Tank	Karnataka	Tumakuru	Irrigation
Sarigehally Tank	Karnataka	Tumakuru	Irrigation
Turuvekere Tank	Karnataka	Tumakuru	Irrigation
Uduthorehalla Dam	Karnataka	Chamarajanagar	Irrigation
Mangala	Karnataka	Tumakuru	Irrigation
Kunigal Doddakere	Karnataka	Tumakuru	Irrigation & Water Supply
Chicklihole	Karnataka	Kodagu	Irrigation
Thippagondanahalli	Karnataka	Bengaluru Urban	Water Supply & Fishing
Siruvani	Kerala	Palakkad	Irrigation & Water Supply

Kossani saddle	Kerala	Wayanad	Hydropower
Kuttiyadi Augmentation main earthen dam	Kerala	Wayanad	Multi-purpose
Karappuzha	Kerala	Wayanad	Multi-purpose
Near Kottagiri Saddle	Kerala	Wayanad	Multi-purpose
Kuttiyadi Aug. spillway	Kerala	Wayanad	Multi-purpose
Nagavathy	Tamil Nadu	Dharmapuri	Irrigation
Uppar(Tiruppur)	Tamil Nadu	Tiruppur	Irrigation & Fishing
Amaravathy	Tamil Nadu	Thiruppur	Multi-purpose
Palar Porandalar	Tamil Nadu	Dindigul	Irrigation
Siddhamalli	Tamil Nadu	Ariyalur	Irrigation
Ponnaniar	Tamil Nadu	Karur	Irrigation
Moyar Forebay	Tamil Nadu	Nilgiris	Hydropower
Maravakandy	Tamil Nadu	Nilgiris	Hydropower
Mukurthy	Tamil Nadu	Nilgiris	Hydropower
Niralapallam	Tamil Nadu	Nilgiris	Hydropower
Glenmorgan	Tamil Nadu	Nilgiris	Hydropower
Mettur	Tamil Nadu	Salem	Multi-purpose
Pykara	Tamil Nadu	Uthagamandalam	Hydropower
Bhavanisagar	Tamil Nadu	Erode	Multi-purpose
Avalanche	Tamil Nadu	The Nilgiris	Hydropower
Emerald	Tamil Nadu	The Nilgiris	Hydropower
Kundahpallam	Tamil Nadu	Uthagamandalam	Hydropower
Sandynallah	Tamil Nadu	Nilgiris	Hydropower
Pegumbahallah Forebay	Tamil Nadu	Nilgiris	Hydropower
Upper Bhavani	Tamil Nadu	Uthagamandalam	Hydropower
Upper Bhavani pumping weir	Tamil Nadu	Nilgiris	Hydropower
Parson Valley	Tamil Nadu	Nilgiris	Hydropower & Water Supply
Porthimund	Tamil Nadu	Uthagamandalam	Hydropower
East Varahapallam weir	Tamil Nadu	Uthagamandalam	Hydropower
Pillur	Tamil Nadu	Coimbatore	Hydropower

West Varahapallam weir	Tamil Nadu	Uthagamandalam	Hydropower
Kuthiraiyar	Tamil Nadu	Dindigul	Irrigation
Parappalar	Tamil Nadu	Dindigul	Irrigation
Pykara New Forebay	Tamil Nadu	Nilgiris	Hydropower
Chinnar	Tamil Nadu	Dharmapuri	Irrigation
Gunderipallam	Tamil Nadu	Erode	Irrigation
Varadhamanadhi	Tamil Nadu	Dindigul	Irrigation
Varattupallam	Tamil Nadu	Erode	Irrigation
Vattamalaikarai Odai	Tamil Nadu	Thiruppur	Irrigation
Kesarigullihalla	Tamil Nadu	Dharmapuri	Irrigation
Thoppaiyar	Tamil Nadu	Dharmapuri	Irrigation
Perumpallam	Tamil Nadu	Erode	Irrigation
Noyyal athupalayam	Tamil Nadu	Karur	Irrigation
Noyyal Orathupalayam	Tamil Nadu	Erode	Irrigation
Kodaganar	Tamil Nadu	Dindigul	Irrigation
Nallathangal Odai	Tamil Nadu	Tiruppur	Irrigation
Nanganjiar	Tamil Nadu	Dindigul	Irrigation
Veeranam	Tamil Nadu	Cuddalore	Irrigation, Water Supply & Fishing
Uppar Trichy	Tamil Nadu	Trichy	Irrigation

Table 37: List of Lift irrigation Systems in CRB (Source: India WRIS)

Name of Lift Irrigation System	**State**	**Basin**
Kama Samundra Lift Station - I	Karnataka	Cauvery river
Nanjapura Lift Station	Karnataka	Cauvery river
Kachnahalli Lift Station Stage - I	Karnataka	Cauvery river
Kama Samundra Lift Station - II	Karnataka	Cauvery river
Kachnahalli Lift Station Stage - III	Karnataka	Cauvery river
Kachnahalli Lift Station Stage - II	Karnataka	Cauvery river
Huchanakoppalu Lift Station Stage - I	Karnataka	Cauvery river
Huchanakoppalu Lift Station Stage - II	Karnataka	Cauvery river
Banahalli Hundi Lift Station	Karnataka	Cauvery river
Gorur	Karnataka	Cauvery river
Arkavathi LIS I	Karnataka	Cauvery river
Arkavathi LIS II	Karnataka	Cauvery river
Kabini LIS	Karnataka	Cauvery river
Iggalur LIS A	Karnataka	Cauvery river
Iggalur LIS B	Karnataka	Cauvery river
Iggalur LIS CI	Karnataka	Cauvery river
Iggalur LIS C II	Karnataka	Cauvery river
Iggalur LIS D	Karnataka	Cauvery river
Periyapatna LIS	Karnataka	Cauvery river
Somwarpet LIS	Karnataka	Cauvery river

Table 38: Households by main source of drinking water and location – Total (Urban + Rural)

Area Name	Total Number of Households	Main Source of Drinking Water									
		Tap water from treated source	Tap water from un-treated source	Covered well	Un-covered well	Handpump	Tubewell/ Borehole	Spring	River/ Canal	Tank/ Pond/ Lake	Other sources
Chikkamagaluru	272173	85114	100900	2513	21964	10670	35987	4438	5006	3607	1974
Tumakuru	636394	159314	266055	5136	5715	40196	152051	346	360	518	6703
Bengaluru urban	2377056	1582408	297747	12548	6734	11094	389833	1512	2239	7720	65221
Mandya	426578	176055	154772	2641	5650	26044	58173	353	673	132	2085
Hassan	429292	128638	143631	2701	9610	37074	103177	633	1165	856	1807
Kodagu	138303	45107	21617	7594	38445	3437	13535	2188	2943	2450	987
Mysuru	688422	424907	142537	1474	7698	45607	56899	607	3666	891	4136
Chamarajanagar	244198	79316	76198	3117	7018	30416	44366	363	994	188	2222
Chikkaballapura	282311	80234	121562	1322	2553	3057	67599	467	117	383	5017
Bengaluru rural	224745	43888	106274	591	775	2308	63010	47	45	70	7737
Ramanagaram	259794	94850	115545	856	980	4185	41557	177	63	45	1536
Wayanad	185403	27374	14489	12883	109208	241	5784	9019	541	2890	2974
Palakkad	628287	209449	59903	46246	257588	1925	33936	6019	2587	1540	9094
Idukki	276976	50931	32728	21669	90049	572	10710	42226	2746	17303	8042
Salem	918899	570477	153489	8853	79818	18883	77409	1128	1706	414	6722
Namakkal	477757	276658	89152	4250	35099	4143	61860	578	2340	154	3523
Erode	658734	420277	91613	5249	35671	7934	88031	922	5672	270	3095
Nilgiris	198922	119549	37578	13180	15347	209	2431	7170	1546	1310	602
Dindigul	563172	286624	172723	4748	21095	9069	57892	3328	1758	934	5001
Karur	287848	168269	81929	1311	7098	5173	20977	291	683	23	2094
Tiruchirappalli	700852	466640	141133	3295	12369	22438	47674	888	862	839	4714
Perambalur	149401	41710	81193	1060	7474	6301	9740	67	59	933	864

Ariyalur	198106	87425	85879	668	7201	6097	8599	347	275	609	1006
Cuddalore	637422	315433	183013	2659	8151	60026	62059	1409	464	138	4070
Nagapattinam	412656	168886	98052	1346	5211	114339	20471	151	71	291	3838
Thiruvarur	327971	75521	169013	937	860	56561	21924	287	134	241	2493
Thanjavur	605074	182944	316956	1007	1831	62766	34935	1448	152	98	2937
Pudukkottai	390628	174217	127335	2352	10324	10705	28927	5933	2213	22488	6134
Dharmapuri	380924	105083	107139	5473	59989	50973	48634	299	939	125	2270
Krishnagiri	450062	212861	127363	4307	21597	28173	50206	1279	741	298	3237
Coimbatore	945943	828741	58219	3989	14470	2998	27863	758	1164	98	7643
Tiruppur	700706	528129	83224	4567	23777	5279	47188	244	1574	113	6611
Karaikal	50068	41287	4086	88	81	2448	1788	28	3	2	257
Mayiladuthurai	412656	168886	98052	1346	5211	114339	20471	151	71	291	3838

Table 39: Households by main source of drinking water and location – Urban

Area Name	Total Number of Households	Main Source of Drinking Water									
		Tap water from treated source	Tap water from un-treated source	Covered well	Un-covered well	Handpump	Tubewell / Borehole	Spring	River/ Canal	Tank/ Pond/ Lake	Other sources
Wayanad	6717	1716	315	201	4035	21	136	175	2	28	88
Palakkad	151969	75158	7644	12081	48422	229	7341	73	30	47	944
Idukki	12327	5676	421	3288	2634	11	193	4	4	46	50
Salem	463935	346958	54674	3868	15975	5500	30698	172	613	78	5399
Namakkal	193601	137102	23201	986	6269	1707	21018	177	1049	48	2044
Erode	334637	242992	30689	1949	12594	3336	36968	204	3470	36	2399
Nilgiris	114556	73708	16861	7293	8852	166	1046	4620	677	800	533
Dindigul	210415	139013	38865	1044	2750	4455	18880	937	263	517	3691
Karur	119018	84381	23676	305	743	2467	6441	76	95	16	818
Tiruchirappalli	342041	262645	35619	909	1804	9549	26693	659	480	49	3634
Perambalur	24982	11637	8689	509	942	452	2616	18	24	3	92
Ariyalur	21288	14503	5376	86	349	9	830	0	0	0	135
Cuddalore	212231	119366	34175	1477	3785	11752	38408	1001	23	35	2209
Mayiladuthurai	89316	44837	20707	335	999	16278	5450	33	12	10	655
Nagapattinam	89316	44837	20707	335	999	16278	5450	33	12	10	655
Thiruvarur	65292	13351	34087	138	222	8750	8120	84	18	12	510
Thanjavur	213883	58690	121740	443	670	13907	17506	45	40	17	825
Pudukkottai	77760	52170	16625	285	666	889	5008	135	13	610	1359
Dharmapuri	65361	27812	13885	548	3386	5617	12386	39	110	6	1572
Krishnagiri	105255	68358	13586	828	1544	3097	15697	568	69	45	1463
Coimbatore	708788	651536	34502	1593	3037	1704	8766	498	612	58	6482
Tiruppur	417566	359524	32411	1386	4443	1922	11485	88	692	39	5576

Karaikal	24210	20638	2426	29	71	454	427	27	2	2	134
Chikkamagaluru	56839	35925	14686	280	659	671	4060	47	63	38	410
Tumakuru	140509	91138	29972	662	1318	1687	11264	42	63	110	4253
Bengaluru urban	2169428	1520712	218070	11742	5896	9247	331822	1261	2175	7615	60888
Mandya	72529	59299	4984	288	414	765	5838	14	304	8	615
Hassan	89381	62913	16227	125	230	867	8534	23	237	4	221
Kodagu	19794	14010	1686	1090	1626	295	914	50	61	46	16
Mysuru	286767	256441	14309	153	260	2408	10064	193	1214	411	1314
Chamarajanagar	40450	30185	5783	147	165	577	3093	26	75	11	388
Chikkaballapura	62002	29069	19647	227	154	147	8636	92	44	40	3946
Bengaluru rural	62347	12464	37059	110	78	189	6083	21	1	20	6322
Ramanagaram	59623	40742	14229	230	197	194	3473	133	9	6	410

Table 40: Households by main source of drinking water and location – Rural

Area Name	Total Number of Households	Main Source of Drinking Water									
		Tap water from treated source	Tap water from un-treated source	Covered well	Un-covered well	Handpump	Tubewell/ Borehole	Spring	River/ Canal	Tank/ Pond/ Lake	Other sources
Wayanad	6717	1716	315	201	4035	21	136	175	2	28	88
Palakkad	151969	75158	7644	12081	48422	229	7341	73	30	47	944
Idukki	12327	5676	421	3288	2634	11	193	4	4	46	50
Salem	463935	346958	54674	3868	15975	5500	30698	172	613	78	5399
Namakkal	193601	137102	23201	986	6269	1707	21018	177	1049	48	2044
Erode	334637	242992	30689	1949	12594	3336	36968	204	3470	36	2399
Nilgiris	114556	73708	16861	7293	8852	166	1046	4620	677	800	533
Dindigul	210415	139013	38865	1044	2750	4455	18880	937	263	517	3691
Karur	119018	84381	23676	305	743	2467	6441	76	95	16	818
Tiruchirappalli	342041	262645	35619	909	1804	9549	26693	659	480	49	3634
Perambalur	24982	11637	8689	509	942	452	2616	18	24	3	92
Ariyalur	21288	14503	5376	86	349	9	830	0	0	0	135
Cuddalore	212231	119366	34175	1477	3785	11752	38408	1001	23	35	2209
Mayiladuthurai*	89316	44837	20707	335	999	16278	5450	33	12	10	655
Nagapattinam*	89316	44837	20707	335	999	16278	5450	33	12	10	655
Thiruvarur	65292	13351	34087	138	222	8750	8120	84	18	12	510
Thanjavur	213883	58690	121740	443	670	13907	17506	45	40	17	825
Pudukkottai	77760	52170	16625	285	666	889	5008	135	13	610	1359
Dharmapuri	65361	27812	13885	548	3386	5617	12386	39	110	6	1572
Krishnagiri	105255	68358	13586	828	1544	3097	15697	568	69	45	1463
Coimbatore	708788	651536	34502	1593	3037	1704	8766	498	612	58	6482
Tiruppur	417566	359524	32411	1386	4443	1922	11485	88	692	39	5576

Karaikal	24210	20638	2426	29	71	454	427	27	2	2	134
Chikkamagaluru	56839	35925	14686	280	659	671	4060	47	63	38	410
Tumakuru	140509	91138	29972	662	1318	1687	11264	42	63	110	4253
Bengaluru urban	2169428	1520712	218070	11742	5896	9247	331822	1261	2175	7615	60888
Mandya	72529	59299	4984	288	414	765	5838	14	304	8	615
Hassan	89381	62913	16227	125	230	867	8534	23	237	4	221
Kodagu	19794	14010	1686	1090	1626	295	914	50	61	46	16
Mysuru	286767	256441	14309	153	260	2408	10064	193	1214	411	1314
Chamarajanagar	40450	30185	5783	147	165	577	3093	26	75	11	388
Chikkaballapura	62002	29069	19647	227	154	147	8636	92	44	40	3946
Bengaluru rural	62347	12464	37059	110	78	189	6083	21	1	20	6322
Ramanagaram	59623	40742	14229	230	197	194	3473	133	9	6	410

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