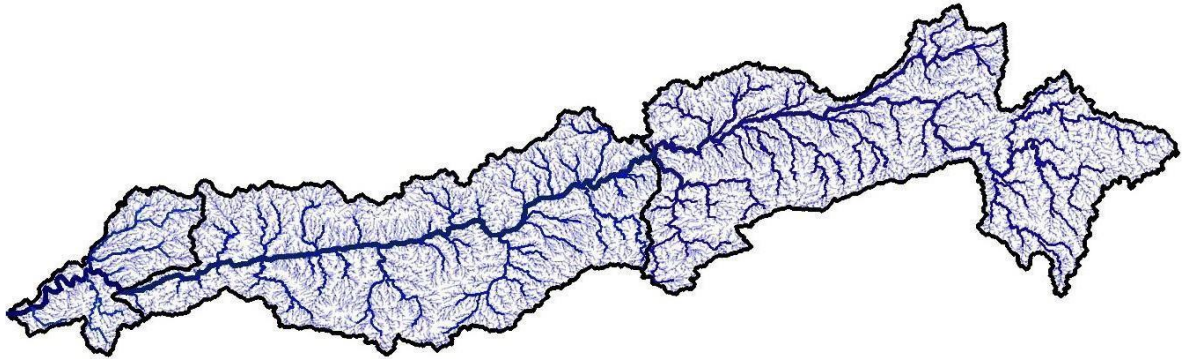




**National River Conservation Directorate**  
Ministry of Jal Shakti,  
Department of Water Resources,  
River Development & Ganga Rejuvenation  
Government of India

# Pollution Load in Narmada River Basin



September 2025



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# Pollution Load in Narmada River Basin



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The National River Conservation Directorate, functioning under the Department of Water Resources, River Development & Ganga Rejuvenation, and the Ministry of Jal Shakti, provides financial assistance to the State Government for the 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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## **Acknowledgment**

This report is a comprehensive outcome of the project jointly executed by IIT Gandhinagar (Lead Institute) and IIT Indore (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.

## **Disclaimer**

This report is a preliminary version prepared as part of the ongoing Condition Assessment and Management Plan (CAMP) project. The analyses, interpretations and data presented in the report are subject to further validation and revision. Certain datasets or assessments may contain provisional or incomplete information, which will be updated and refined in the final version of the report after comprehensive review and verification

## **Team**

Dr. Pranab Kumar Mohapatra, cNarmada, IIT Gandhinagar  
Dr. Ashootosh Mandpe, cNarmada, IIT Indore  
Dr. Divyanshu Kumar Dixit, cNarmada, IIT Indore  
Adarsh Singh, cNarmada, IIT Indore  
Shashank Agrawal, cNarmada, IIT Indore  
Shreya Dixit, cNarmada, IIT Indore

Ashok Kumar Parmar, cNarmada, IIT Gandhinagar  
Rajesh Kumar, cNarmada, IIT Gandhinagar  
Priyal Jasmani, cNarmada, IIT Gandhinagar  
Dr Vinod Tare, cGanga, IIT Kanpur

## **PREFACE**

This report provides an overview of pollution sources, water quality, and waste management systems in the Narmada River Basin, predominantly spanning Madhya Pradesh and supporting inhabitants. It presents detailed assessments of domestic sewage, industrial effluents, agricultural runoff, and solid and hazardous waste management, drawing from national and state monitoring data. The analysis highlights generally high-water quality in much of the basin, with localized pollution challenges in urban and industrial hubs, where gaps in sewage treatment and effluent management remain critical.

The report compiles and organizes previously scattered information from government sources, official reports, and research studies, while acknowledging the challenges of incomplete or uneven data coverage. Particular attention is given to the uneven development of sewage treatment plants, the limited reach of scientific solid waste disposal in smaller towns, and the underdeveloped state of e-waste management, in contrast with successful initiatives such as biomining, composting, and waste-to-energy plants.

We extend our sincere gratitude to the government agencies, research institutions, project staff, and individuals whose contributions of data and insights made this assessment possible. It is our hope that this report inspires informed dialogue and coordinated action, contributing to the restoration and long-term sustainability of the Narmada River Basin for both ecological health and socio-economic development.

**Centres for Narmada River Basin  
Management Studies (cNarmada)  
IIT Gandhinagar, IIT Indore**

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# 1 Introduction

## 1.1 Background

The Narmada River is one of the major rivers in India. It flows west and supports millions of people in Madhya Pradesh, Gujarat, Maharashtra, and Chhattisgarh. The Narmada River Basin covers about 98,786 square kilometres. Around 20.4 million people live in the basin. The basin has 38 districts, more than 17,000 villages, and nearly 3 million households.

Madhya Pradesh has the largest area and population in the basin. The Upper Basin has big towns like Jabalpur, Narsimhapur, Mandla, and Hoshangabad. The Middle Basin has mostly rural and tribal areas, like Khargone, Dhar, and Barwani. The Lower Basin has towns like Bharuch, Ankleshwar, Rajpipla, and Chhota Udepur, but most people live in villages.

The river provides water for drinking, farming, industries, hydropower, fisheries, and cultural activities. It also supports forests, wildlife, and agriculture. But the river is facing more pollution now. Cities, industries, and farms release untreated sewage, industrial waste, and chemical runoff into the river. Solid waste and hazardous waste also pollute the water and land. During monsoon, water flow reduces pollution temporarily, but in dry seasons, pollution becomes stronger.

The river basin has natural boundaries. The Vindhya ranges are in the north, the Satpura ranges in the south, and the Maikala ranges in the east. The basin has three parts. The Upper Basin has hills and forests. The Middle Basin has fertile plains and farmland. The Lower Basin has flat alluvial land but also faces pressure from towns and industries. The river gets water from 41 tributaries, which adds to its flow and ecology.

The Narmada Basin has a mix of urban, industrial, and rural areas. About 8.6 million people live in the Upper Basin, 9.1 million in the Middle Basin, and 2.7 million in the Lower Basin. Farming, industries, and cities together create pollution challenges. Untreated sewage, industrial effluents, chemical runoff, and solid waste often enter the river. Hazardous waste from large industries, especially in Bharuch, adds to land and water pollution.

Although there are treatment plants for sewage, industrial effluents, and hazardous waste, their capacity is not enough. Polluted water and untreated waste often reach the river and nearby land. This has created pollution hotspots in the basin.

This report studies the pollution load in the Narmada Basin. It looks at natural and administrative boundaries, waste generation, treatment, and areas under high pressure. The report aims to show the current pollution situation and help plan better management of sewage, industrial waste, and solid waste in the future.

## **1.2 Methodology and Data Source**

This report mainly used secondary data from government sources. Important data came from NGT reports, MPPCB reports, GPCB reports, and other official documents. These reports give information on water quality, pollution sources, and waste management in the Narmada River Basin. The data is reliable and collected using standard methods.

In addition to secondary data, the study included three group field visits. The visits were to Indore, Bhopal, Jhabua, Alirajpur, and Dewas. The team met officials from MPPCB, Narmada Valley Development Authority, local Panchayats, and municipalities. The goal was to check data, get unpublished information, and understand problems in pollution monitoring and data management.

Three visits were also made to GPCB in Gandhinagar. These visits helped to get data not available in public reports and to verify secondary data.

Using both secondary data and field visits made the study stronger. It helped to assess water quality, pollution hotspots, and solid waste management in the basin. This method gives a clear understanding of the river's condition and supports planning for better pollution management.

## **Data Sources and Review Steps**

Data collection included gathering datasets and official records from national and state water quality monitoring stations. These included stations run by CPCB, GPCB, and MPPCB. The study also looked at government reports, policy documents, and archives from regional development authorities. These sources helped to understand how water quality and pollution levels change across different areas and over time in the basin..

## **Field Visits**

Three major field visits were conducted to the important urban centres of Indore, Bhopal, Jhabua, Alirajpur, and Dewas. The visits facilitated direct interaction with key governmental



offices such as MPPCB regional offices, Narmada Valley Development Authority, Zila Panchayats, and Collector offices. These engagements focused on securing access to unpublished datasets, clarifying data ownership and management roles, and observing ground realities relating to pollution monitoring and waste management.

## **Data Acquisition Challenges**

The field visits highlighted challenges in acquiring datasets directly from governmental departments, especially in Bhopal, where fragmentation of data responsibility required formal requests and follow-up communications. These insights underscored the complexities of decentralized environmental governance and the need for persistent stakeholder engagement.

In lower basin data made available with multiple field visit, telephonic contacts and email follow ups. However, some data was missing and not available for the current month and year.

## **Outcomes**

The combined methodology of secondary data analysis and group field visits enabled ground-level validation of desk-based findings, identification of institutional barriers to pollution data transparency, and an enriched understanding of water quality and solid waste management challenges in the Narmada River Basin. This comprehensive approach facilitated a nuanced environmental assessment capable of informing future management strategies.

## **2. Water Quality Status**

### **2.1 Monitoring Stations and Sampling Locations**

#### **2.1.1 National Water Quality Monitoring Stations**

The **National Water Quality Monitoring Programme (NWMP)** is an initiative of the **Central Pollution Control Board (CPCB)** in collaboration with **State Pollution Control Boards (SPCBs)** and other allied agencies to monitor the quality of water resources across India systematically. The programme aims to assess the health of rivers, lakes, tanks, ponds, reservoirs, and groundwater sources, ensuring the availability of safe water and supporting sustainable water resource management.

In the **Narmada Basin**, the NWMP network is jointly implemented by the **Madhya Pradesh Pollution Control Board (MPPCB)** and the **Gujarat Pollution Control Board (GPCB)**. Within the **Madhya Pradesh region**, more than **80 monitoring stations** have been established under the NWMP framework. These stations encompass diverse water bodies, including the main stem of the Narmada River, its tributaries, lakes, ponds, tanks, reservoirs, and groundwater sources. Monitoring is conducted on a **monthly basis** for surface water and **half-yearly** for groundwater sources.

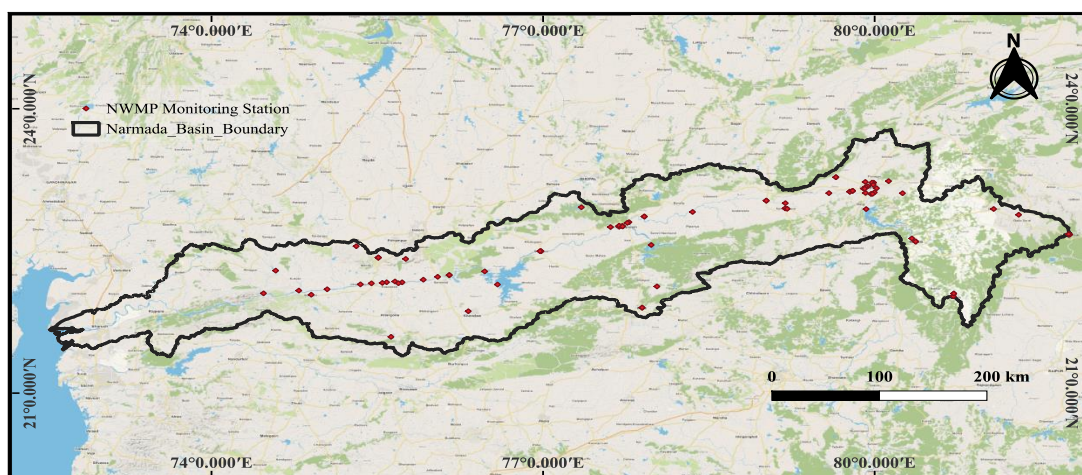
The stations are strategically distributed from the **source of the Narmada at Amarkantak** in the Maikal ranges, through key urban and rural centers such as **Mandla, Jabalpur, Hoshangabad, Nemawar, Omkareshwar, Maheshwar, and Barwani**, extending up to the **interstate boundary near Kakrana, Alirajpur**. This extensive coverage ensures that the entire upper and middle stretches of the river, as well as important reservoirs and groundwater sources, are comprehensively assessed for water quality status.

The **map of the Narmada Basin in Madhya Pradesh** is shown in **Figure 1**, highlighting the spatial distribution of monitoring stations across the upper and middle basin. The **detailed list of these stations**, including station codes, coordinates, and corresponding districts, is presented in **Annexure Table A1**.

Extending further downstream, the **Lower Narmada Basin** lies within the **Gujarat region**, covering **six districts** — **Narmada, Bharuch, Vadodara, Chhota Udepur, Panchmahal, and Surat**. Under the NWMP, **six surface water monitoring stations** have been established by **GPCB** along the river stretch and associated water bodies. These include key locations such as **Panetha, Garudeshwar, Chandod, Zadeshwar, Zanor, and Navagam**, representing critical monitoring points in the lower reach of the river where industrial, agricultural, and domestic influences are more pronounced.

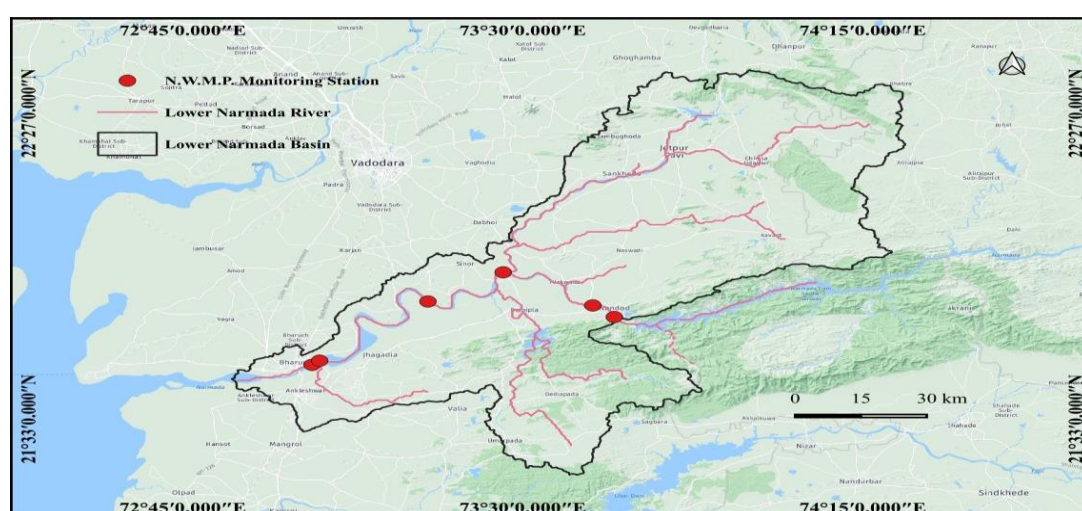
Monitoring in the Gujarat stretch follows the same frequency pattern — **monthly sampling for surface water** and **biannual sampling for groundwater**. The data generated from these stations help evaluate the influence of urban settlements, industrial clusters, and agricultural runoff on the river's overall water quality before it meets the **Arabian Sea**.

The **map of the Narmada Basin in Gujarat** is shown in **Figure 2**, depicting the spatial distribution of all monitoring stations under the NWMP network. The **detailed list of Gujarat monitoring stations**, along with their coordinates and corresponding districts, is provided in **Annexure Table A1 (A)**.



**Figure 1 Spatial Distribution of National Water Quality Monitoring Stations in the Narmada Basin, Madhya Pradesh**

\*(Source: CPCB, List of NWMP Monitoring Network)



**Figure 2 Spatial Distribution of National Water Quality Monitoring Stations in the Narmada Basin, Gujarat**

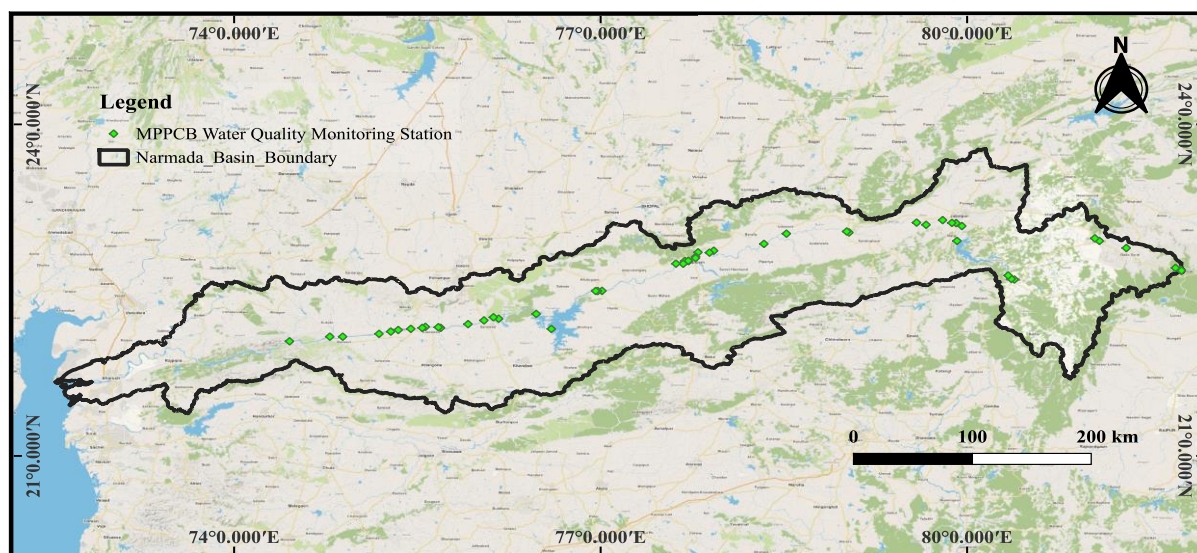
\*(Source: CPCB, List of NWMP Monitoring Network)

## 2.1.2 MPPCB Water Quality Monitoring Stations

The Madhya Pradesh Pollution Control Board (MPPCB) has established an extensive network of 50 water quality monitoring stations along the Narmada River to assess its ecological health and track changes over time. These stations are strategically located from the river's origin at Amarkantak in Anuppur district to its downstream stretches in Alirajpur and Barwani, ensuring coverage of all major confluences, urban centres, and industrially influenced reaches.

The monitoring programme evaluates water quality on an annual basis under the National Water Quality Monitoring Programme (NWMP). Parameters are assessed and categorized into classes A, B, C, D, and E, where Class A represents water fit for drinking after conventional treatment and disinfection, and Class B represents water suitable for outdoor bathing.

The spatial distribution shown in in **Fig. 3** of the 50 monitoring stations is depicted in the accompanying map of the Narmada Basin, which highlights the spread of monitoring efforts across districts. The dataset provides an important basis for water quality management, pollution control enforcement, and sustainable river basin planning in Madhya Pradesh.



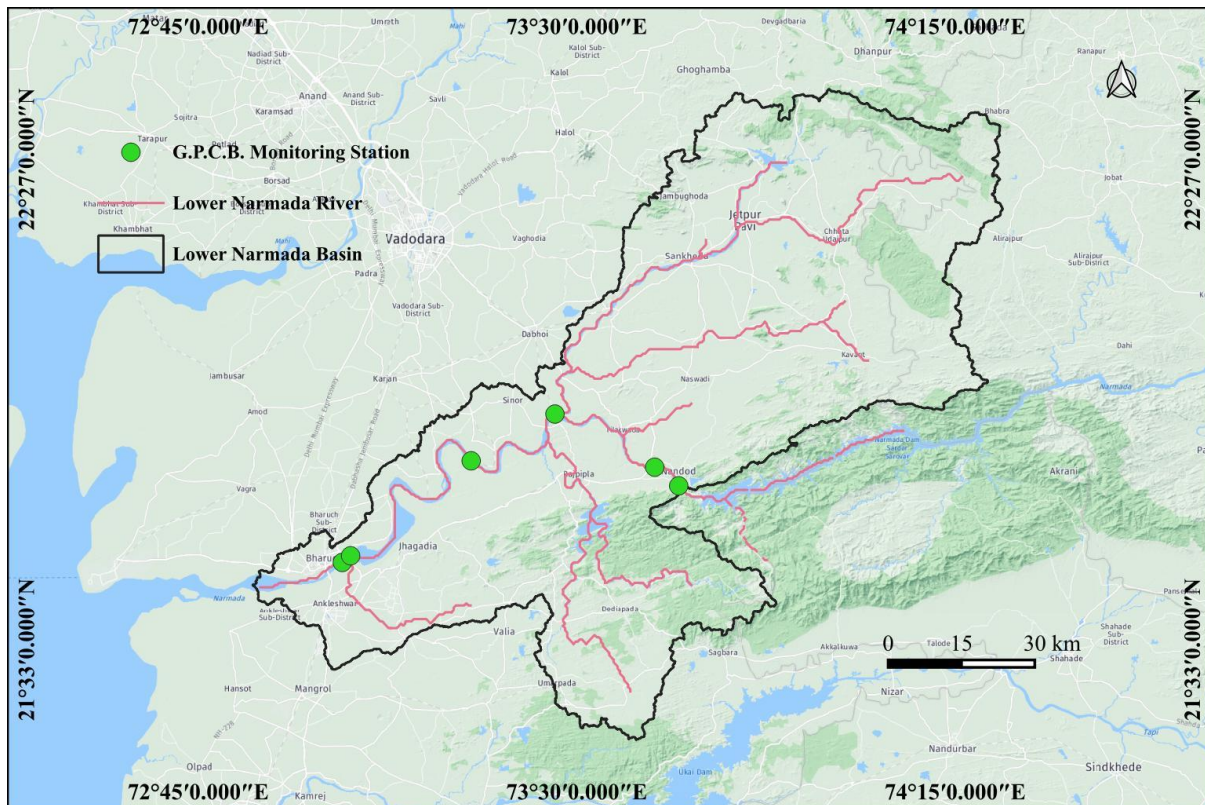
*Figure 3 Spatial Distribution of MPPCB Water Quality Monitoring Stations in the Narmada Basin, Madhya Pradesh*

*\*(Source: Locations are digitized using Google Maps after taking reference of locations from the MPPCB Narmada Water Quality Report 2024-25)*

### 2.1.3 GPCB Water Quality Monitoring Stations

The spatial distribution of the 6 monitoring stations, as shown in **Fig. 4**, is depicted in the accompanying map of the Narmada Basin, which highlights the spread of monitoring efforts across the lower basin.





**Figure 4 Spatial Distribution of GPCB Water Quality Monitoring Stations in the Narmada Basin, Gujarat**  
*(Source: Locations are digitized using Google Maps after taking reference of locations from the GPCB Narmada Water Quality Report 2024-25)*

## 1. Panetha

Panetha station lies in the upstream portion of the lower basin, before major urban and industrial influences accumulate. It is located in a relatively rural setting, with limited direct discharge from settlements and industries. The hydrology here is influenced by river flow from upstream catchments and seasonal rainfall. Panetha is important as a baseline station representing relatively pristine conditions in the lower basin. Its monitoring provides insight into natural water quality trends and serves as a benchmark to compare impacts at downstream stations.

## 2. Garudeshwar

Garudeshwar station lies in the middle-lower transitional stretch of the Narmada River. It is located downstream of Panetha, where the river begins to integrate more significant local inputs, including agricultural runoff and small-scale domestic discharge. Garudeshwar is situated near important agricultural zones, and the river here receives runoff rich in nutrients and sediments during the monsoon. This station reflects the transitional phase of water quality,

balancing upstream purity with local anthropogenic impacts. Monitoring here helps understand the influence of agricultural and rural settlements on river health.

### **3. Zonor**

Zonor is further downstream of Garudeshwar, in a region where river flows are influenced by both upstream contributions and local inflows. Zonor Station is strategically located to capture the combined effects of tributary inflows, agricultural runoff, and minor urban discharge. The river stretch at Zonor is characterized by relatively stable flows and natural dilution capacity, which helps moderate pollution loads. This station is significant as it represents a transition point where the river quality generally remains good despite increasing anthropogenic influences.

### **4. Zadeshwar**

Zadeshwar station lies in the lowest stretch of the Central Narmada before it enters the estuarine zone and discharges into the Gulf of Khambhat. This station is closest to urban settlements, industrial zones, and aquaculture activities along the river. Zadeshwar is heavily influenced by domestic sewage inflows, industrial effluents, agricultural runoff, and tidal mixing, making it a key location to assess the cumulative impact of human activities on river water quality. The conditions at this station reflect the stress levels faced by the river before it reaches its estuary and hence provide vital information for environmental management and planning.

### **5. Chandod**

Chandod station is located near the confluence of the Narmada, Orsang, and other minor tributaries, making it a hydrologically significant point in the lower basin. The region holds religious and cultural importance, with regular pilgrimage activities and ritual bathing contributing to localized domestic waste inputs. It can be inferred that the river at Chandod experiences moderate anthropogenic pressure from religious tourism, local settlements, and minor agricultural runoff. Monitoring at this station would provide valuable insights into the influence of cultural and domestic activities on water quality in the lower basin.

### **6. Navagam**

Navagam station lies near the terminal portion of the Narmada River, close to the Sardar Sarovar reservoir backwaters and the estuarine interface. This region is hydrodynamically complex, influenced by reservoir releases, tidal ingress from the Gulf of Khambhat, and saline

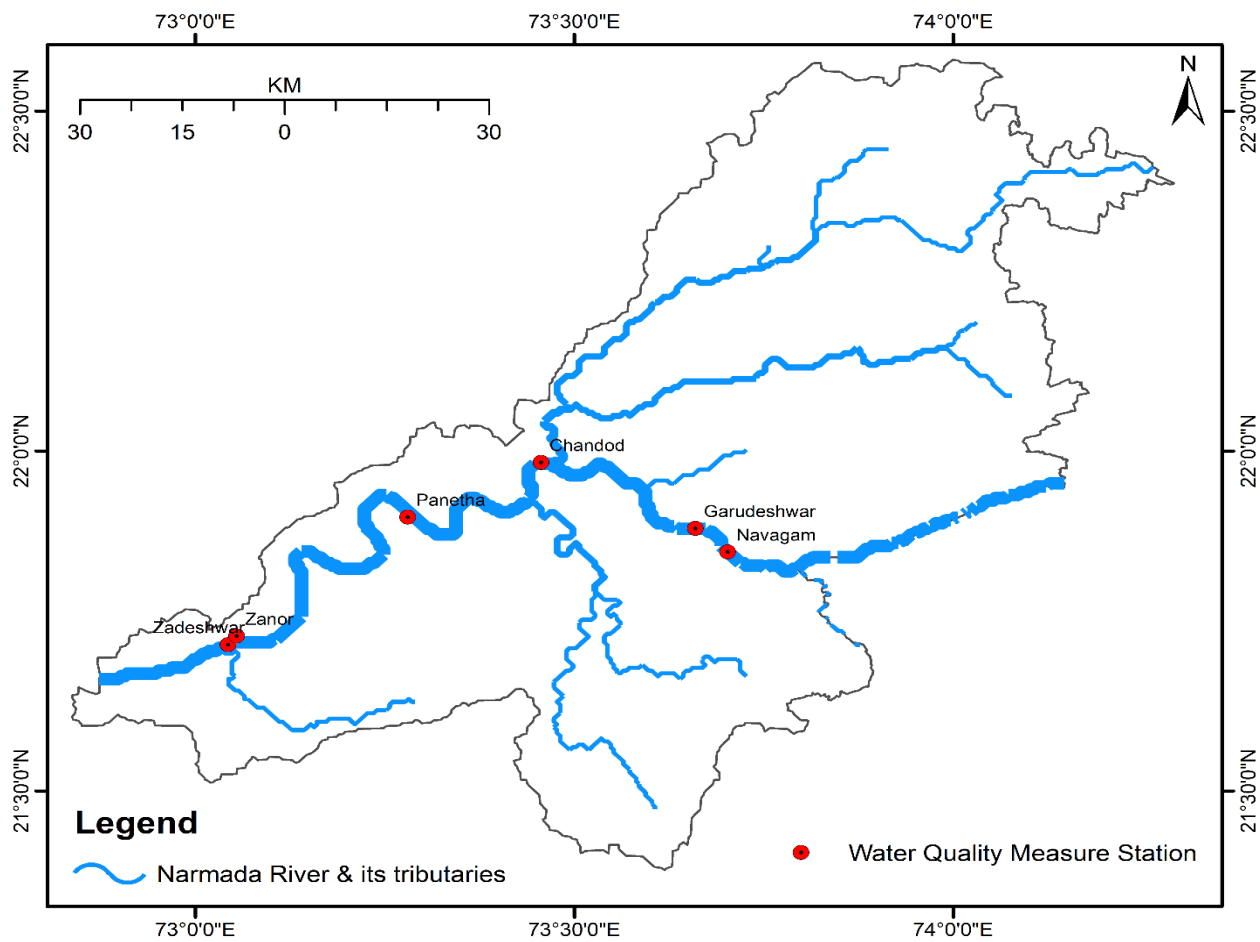
water intrusion during low-flow periods. Navagam is critical for understanding the mixing dynamics between freshwater and saline water and assessing the potential impacts of tidal variation, nutrient loading, and industrial activities along the downstream stretches. Inclusion of this station in regular monitoring programs would help track estuarine health and water quality transition at the river–sea interface.

### ***2.1.3.1 Importance of Monitoring These Stations***

Monitoring these six stations (**Fig. 5**) along the lower Narmada basin provides a spatial gradient of water quality from relatively clean upstream stretches to more impacted downstream locations. This allows identification of:

- **Natural baseline conditions** – Panetha
- **Transitional impacts of rural and agricultural activities** – Garudeshwar
- **Moderate anthropogenic influence with self-purification capacity** – Zonor
- **High anthropogenic pressure from urban, industrial, and estuarine influences** – Zadeshwar
- **Cultural and domestic influences from religious activities** – Chandod
- **Hydrological and tidal interactions in the estuarine transition zone** – Navagam

By analyzing physico-chemical, microbial, and heavy metal parameters at these stations, the study can assess the health of the river, detect pollution trends, and inform targeted management strategies for the lower basin stretch of the Narmada River in Gujarat.



**Figure 5 National Water Quality Monitoring Stations in the Narmada Basin, Gujarat**  
*\*(Source: CPCB, List of NWMP Monitoring Network)*

## 2.2 Key Water Quality Parameters

The Madhya Pradesh Pollution Control Board (MPPCB) and Gujarat Pollution Control Board (GPCB) monitor the water quality of the Narmada River through a set of standard physico-chemical and biological parameters measured every month. These include **pH, Alkalinity, Hardness (Calcium, Magnesium, Total), Chloride, Sulphate, Sodium, Potassium, Nitrite, Phosphate, Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Dissolved Oxygen (DO), Suspended Solids, Total Dissolved Solids, Turbidity, Conductivity, Temperature**, and microbial indicators such as **Total Coliform and Fecal Coliform**. Nutrient-related indicators like **Ammonia Nitrogen (NH<sub>4</sub>-N) and Total Kjeldahl Nitrogen (TKN)** are also assessed to evaluate organic pollution and nutrient enrichment.

The water quality categorization of monitoring stations further corroborates these observations. Data from **2019-20 to 2024-25** shows that a majority of the **50 monitoring stations** along the Narmada River consistently fall under **Category A**, denoting high water quality suitable for drinking water source after conventional treatment and disinfection. However, some stretches,



particularly in **Sehore and Narmadapuram districts**, were temporarily classified under **Category B** during 2019-2021 and again in 2023-24, primarily due to localized pollution inputs. Importantly, by 2024-25, nearly all stations reverted to Category A, with only one site (Pushkar Dam, Amarkantak) registering a Category B classification. The detailed monitoring results are presented in **Annexure Table A2**, which provides monthly parameter values and station-wise water quality categorization for 2019–2025.

The key parameters influencing water quality in the lower basin of the Narmada River have been analyzed and presented station-wise. Each monitoring station reflects distinct local conditions and contributing factors that affect the overall quality of the river water. The station-wise assessment helps in identifying the specific pollutants and their intensity, thereby providing insight into spatial variations and aiding in the formulation of targeted management strategies for improving water quality in the lower basin region.

### **2.2.1. Station: Panetha**

Panetha lies upstream in the lower basin and benefits from relatively lesser human impact compared to downstream stations. **Graph 1 to Graph 24** show the water quality parameters with time from 2015 to 2025 of Panetha Station.

**Organic Pollution (BOD, COD):** Both parameters show a declining trend over the monitoring period, suggesting effective natural self-purification and reduced organic discharge in the catchment area. BOD levels consistently remain low, indicating minimal sewage or industrial organic load.

**Dissolved Oxygen (DO):** DO levels remain high and stable throughout the year (above 6 mg/L), ensuring good ecological conditions for aquatic life. Slight seasonal variations are observed during monsoon due to higher organic load and dilution effects.

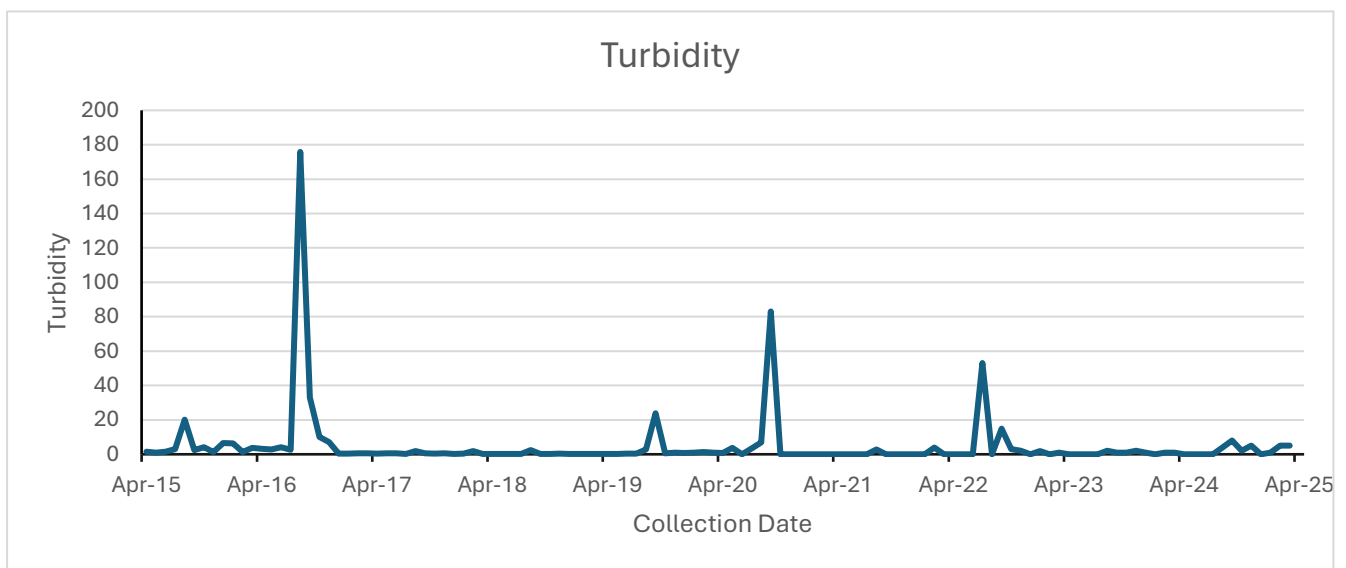
**Nutrients (Nitrate, Phosphate, TKN):** Nitrate and TKN remain moderate and stable. Phosphate levels show a seasonal rise during the monsoon, attributed to agricultural runoff, but remain within permissible limits.

**Microbial Load:** Moderate coliform and E. coli presence during monsoon seasons suggest some influence of surface runoff containing domestic wastewater. However, microbial loads are generally within manageable levels for potential water use.

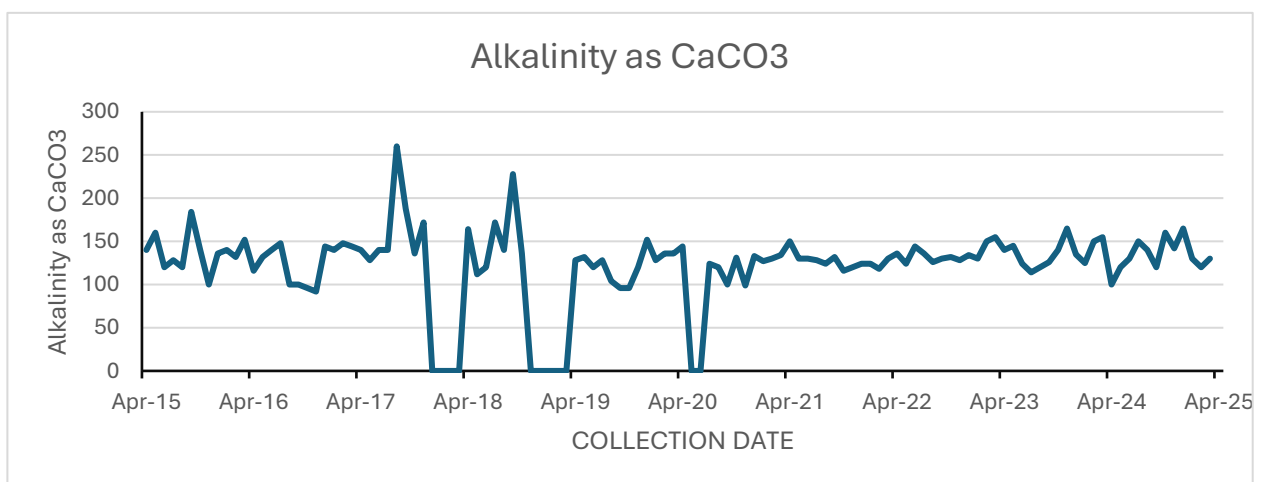
**Metals:** Iron occasionally exceeds the desirable limit during high-flow monsoon periods, likely due to natural leaching from sediments. Other metals such as manganese, lead, and cadmium remain well within limits.

**Salinity & Hardness:** Parameters such as chloride, TDS, and hardness are stable and acceptable, with no indication of salinity stress.

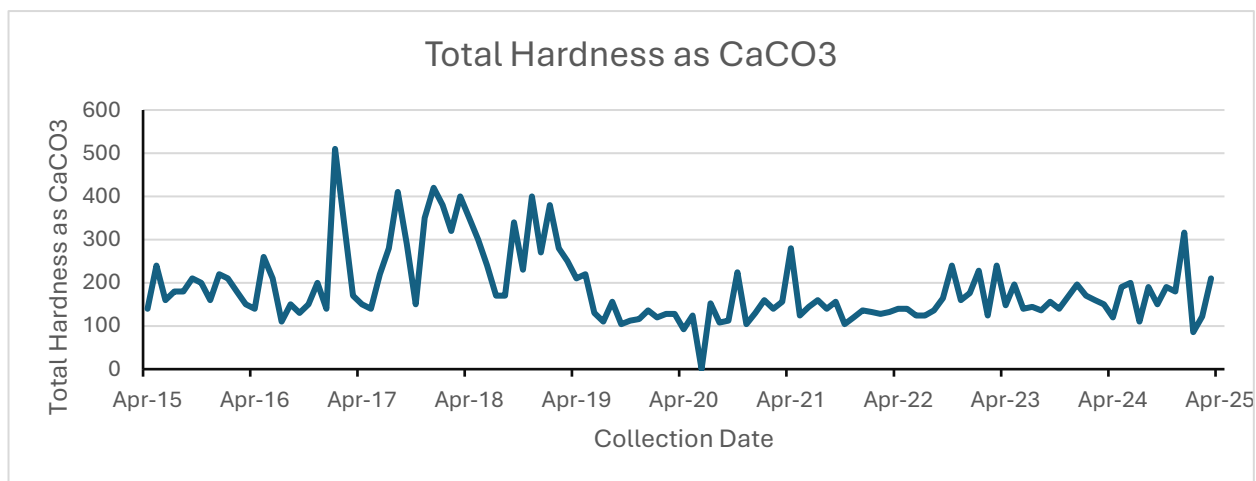
**Overall Condition:** Panetha reflects good water quality with low organic pollution and high DO. Seasonal nutrient and microbial variations warrant routine monitoring.



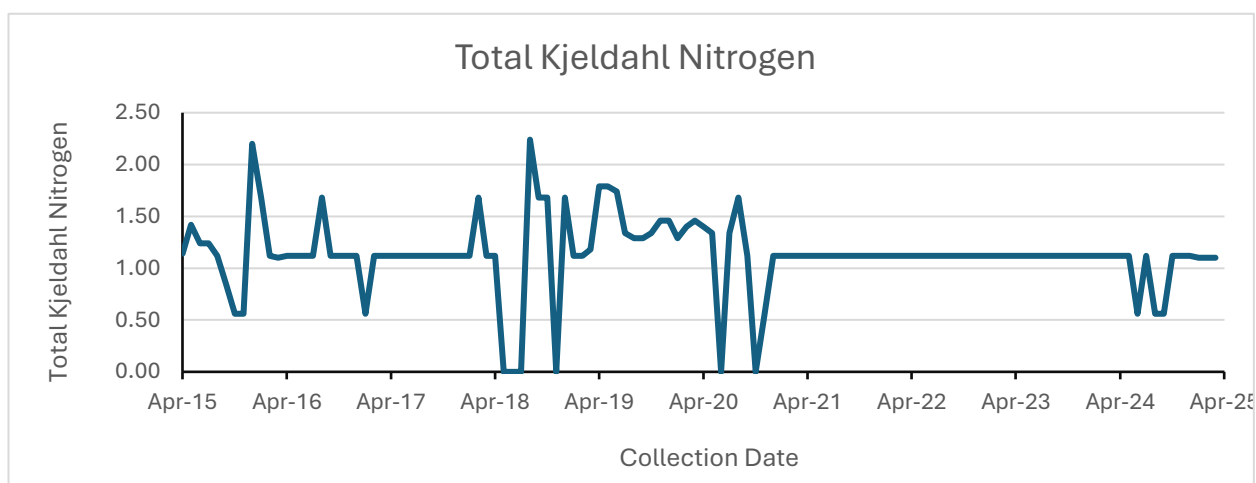
**Graph 1 Monthly variation of Turbidity at Panetha Station (2015-2025)**



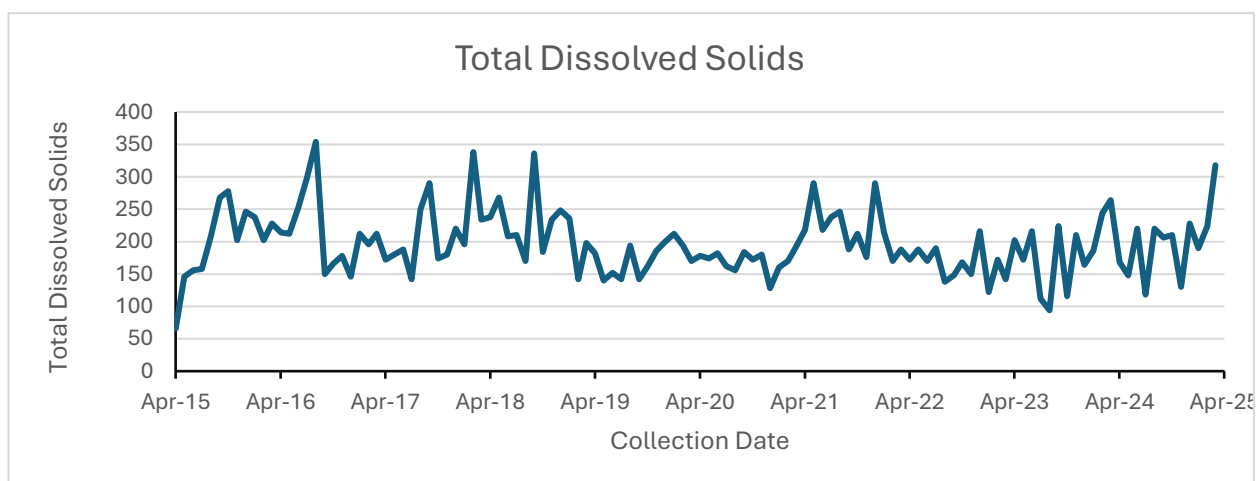
**Graph 2 Monthly variation of Alkalinity as Caco3at Panetha Station (2015-2025)**



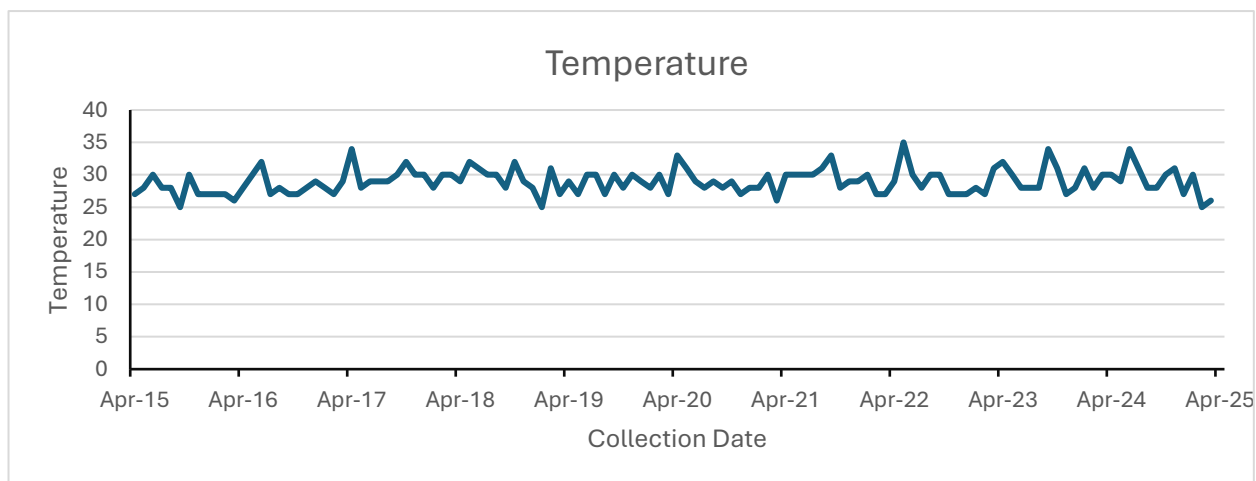
**Graph 2 Monthly variation of Total Hardness as CaCo3 at Panetha Station (2015-2025)**



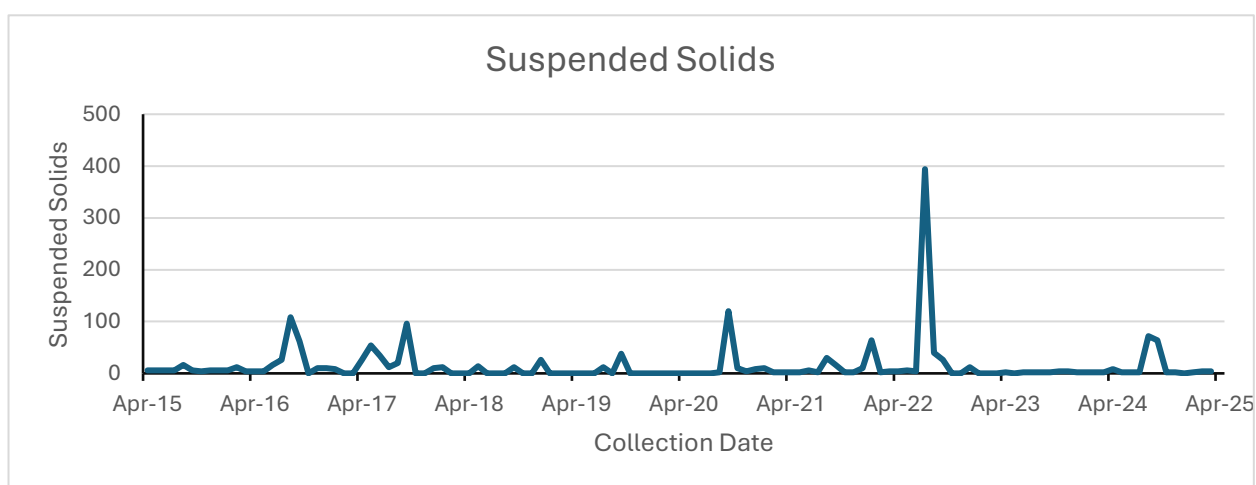
**Graph 3 Monthly variation of Total Kjeldahl Nitrogen at Panetha Station (2015-2025)**



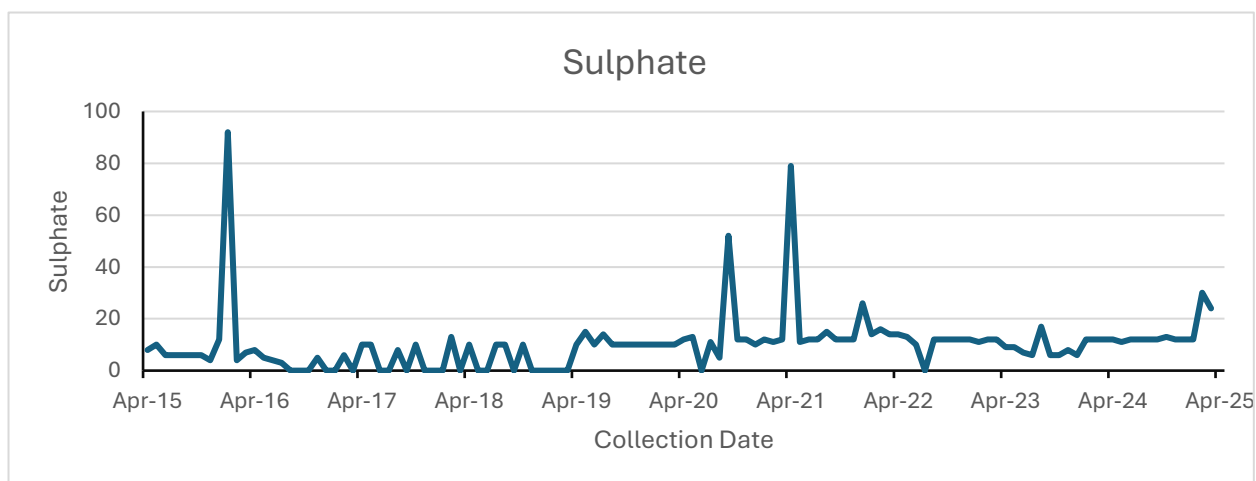
**Graph 4 Monthly variation of Total Dissolved Solids at Panetha Station (2015-2025)**



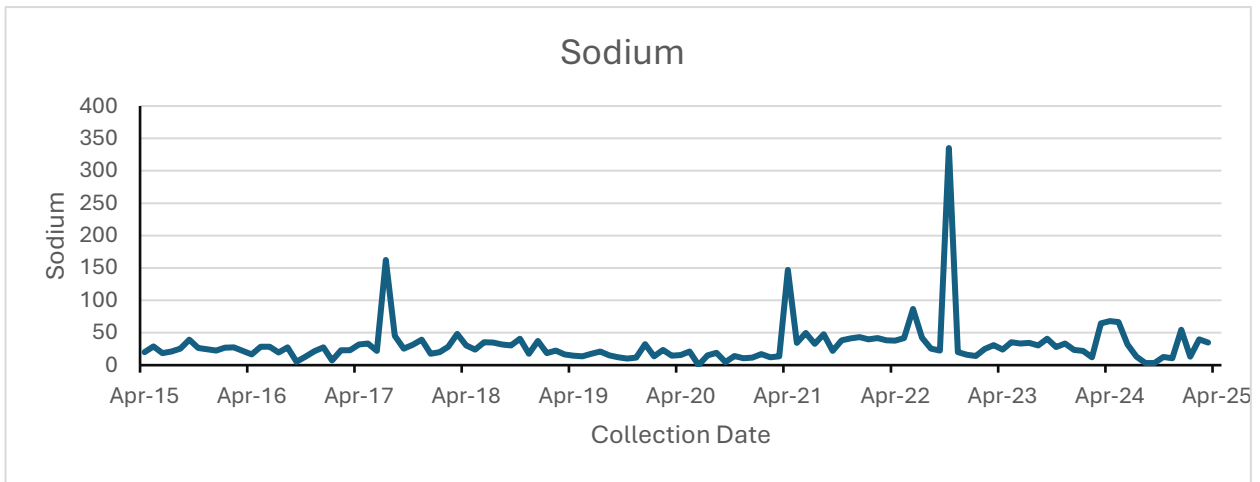
***Graph 5 Monthly variation of Temperature at Panetha Station (2015-2025)***



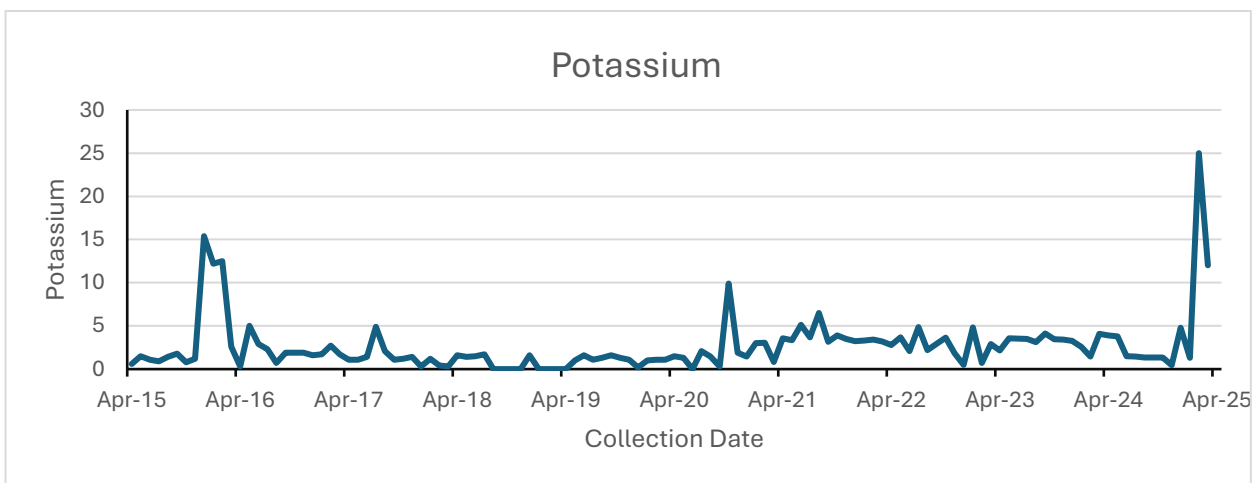
***Graph 6 Monthly variation of Suspended Solids at Panetha Station (2015-2025)***



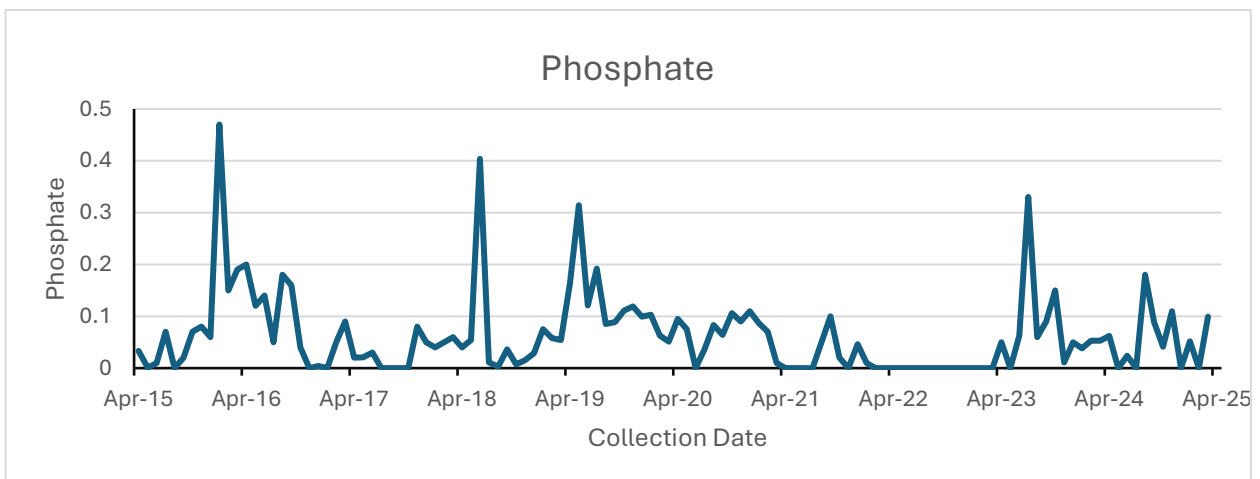
***Graph 7 Monthly variation of Sulphate at Panetha Station (2015-2025)***



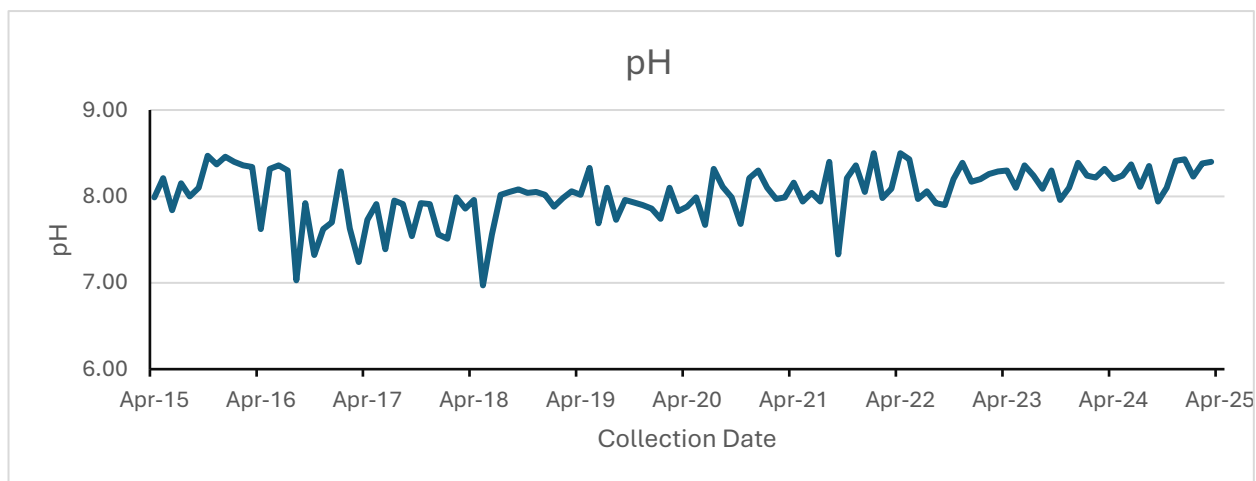
***Graph 8 Monthly variation of Sodium at Panetha Station (2015-2025)***



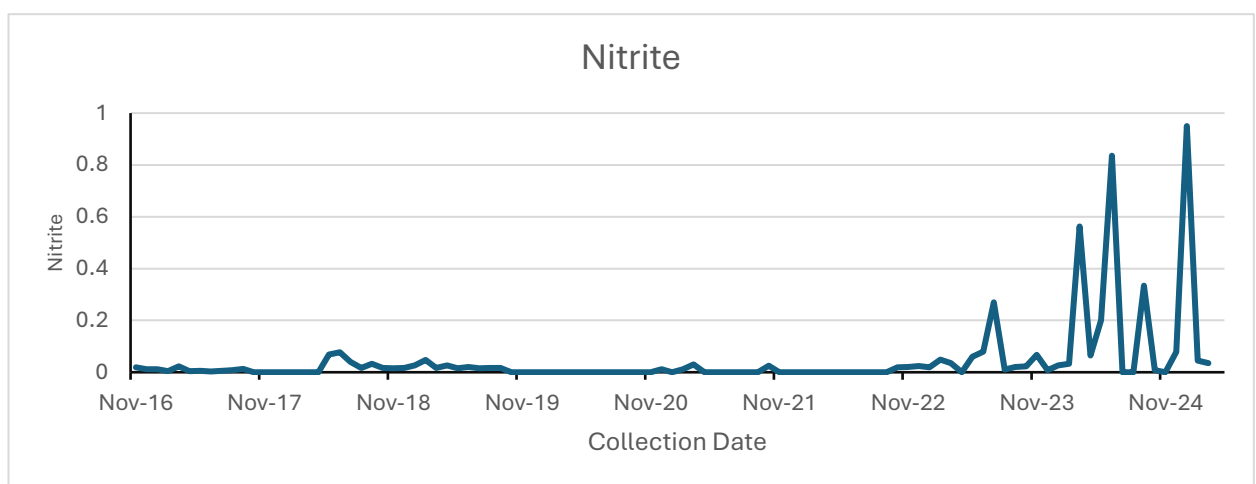
***Graph 9 Monthly variation of Potassium at Panetha Station (2015-2025)***



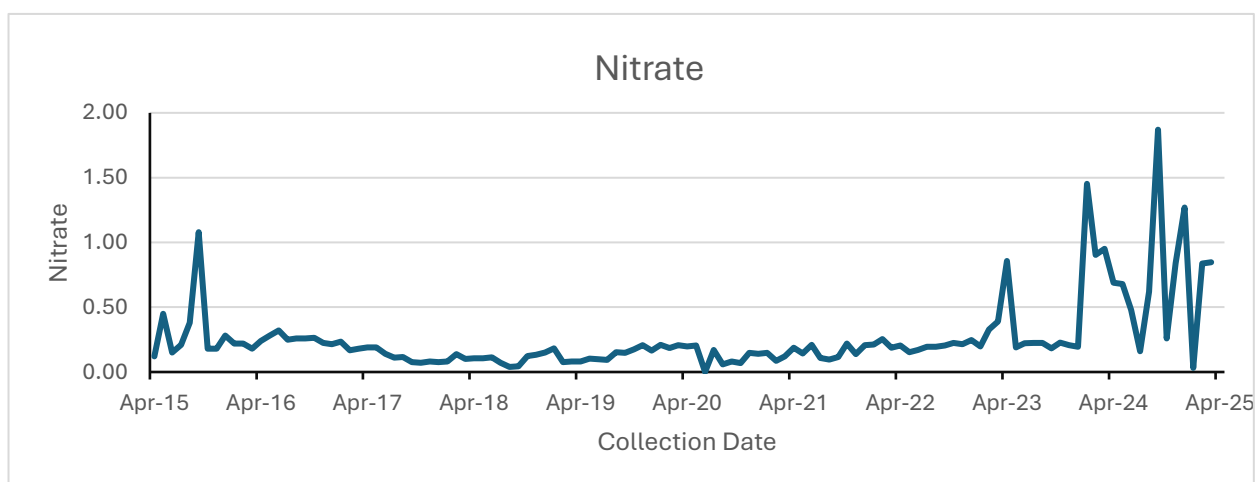
***Graph 10 Monthly variation of Phosphate at Panetha Station (2015-2025)***



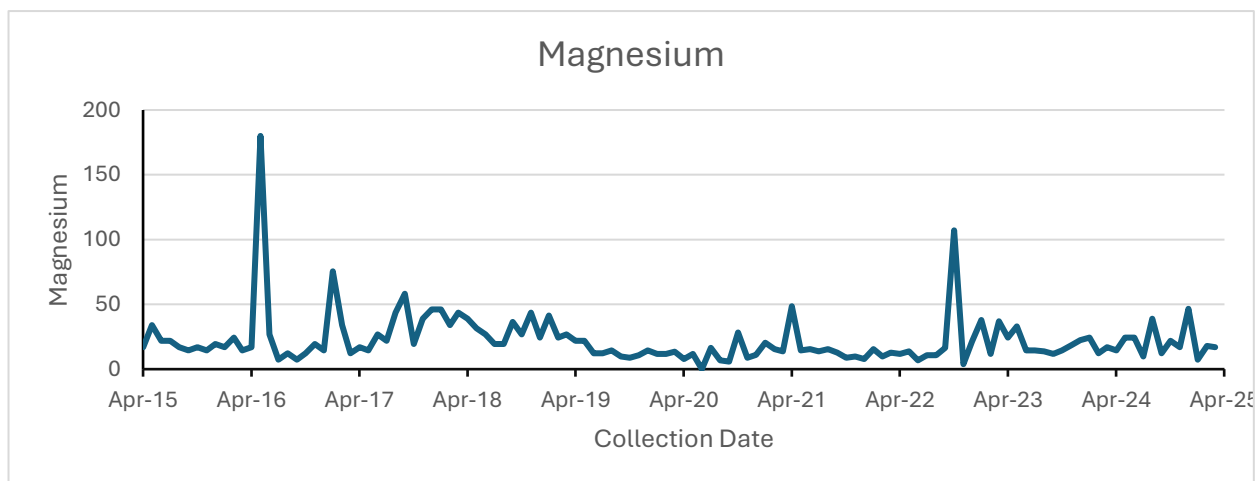
***Graph 11 Monthly variation of pH at Panetha Station (2015-2025)***



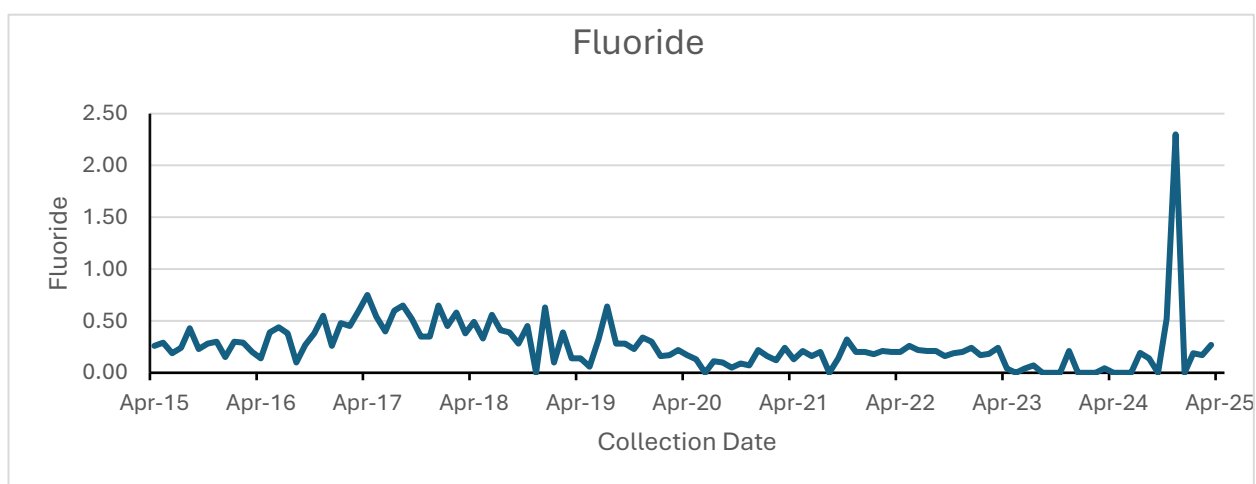
***Graph 12 Monthly variation of Nitrite at Panetha Station (2016-2025)***



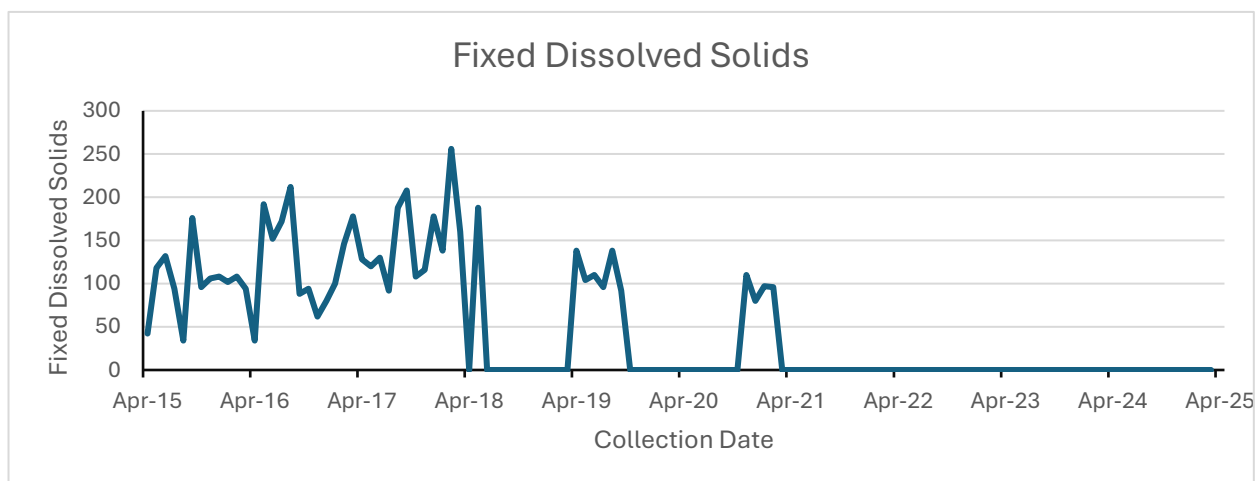
***Graph 13 Monthly variation of Nitrate at Panetha Station (2015-2025)***



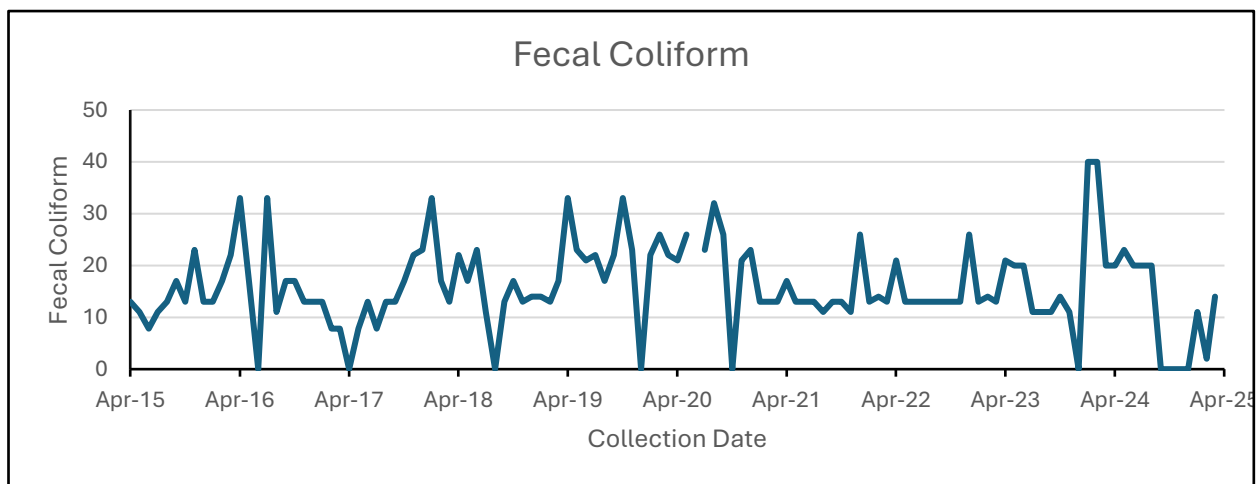
***Graph 14 Monthly variation of Magnesium at Panetha Station (2015-2025)***



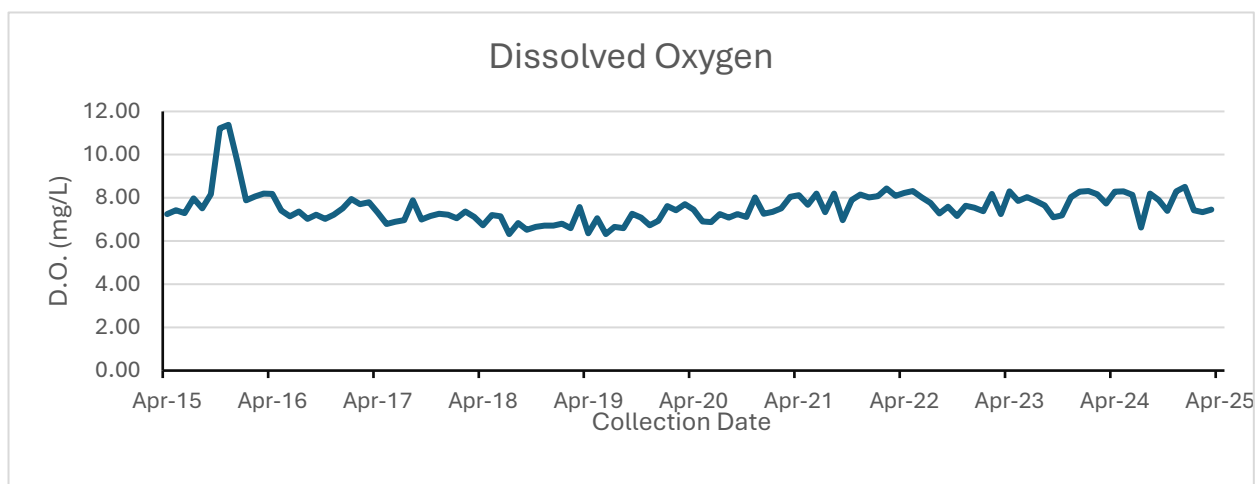
***Graph 15 Monthly variation of Fluoride at Panetha Station (2015-2025)***



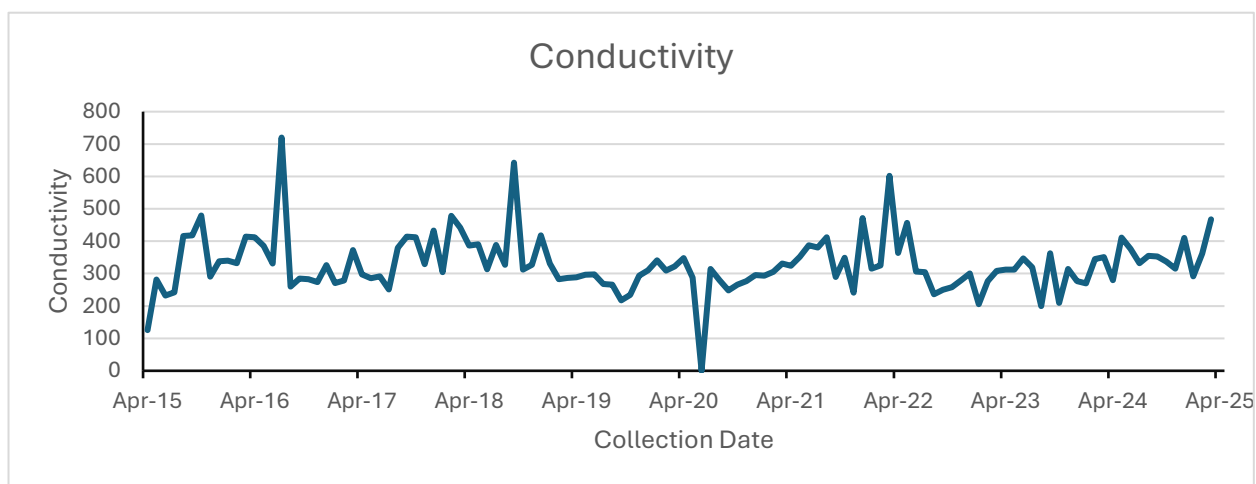
***Graph 16 Monthly variation of Fixed Dissolved Solids at Panetha Station (2015-2025)***



***Graph 17 Monthly variation of Fecal Coliform at Panetha Station (2015-2025)***

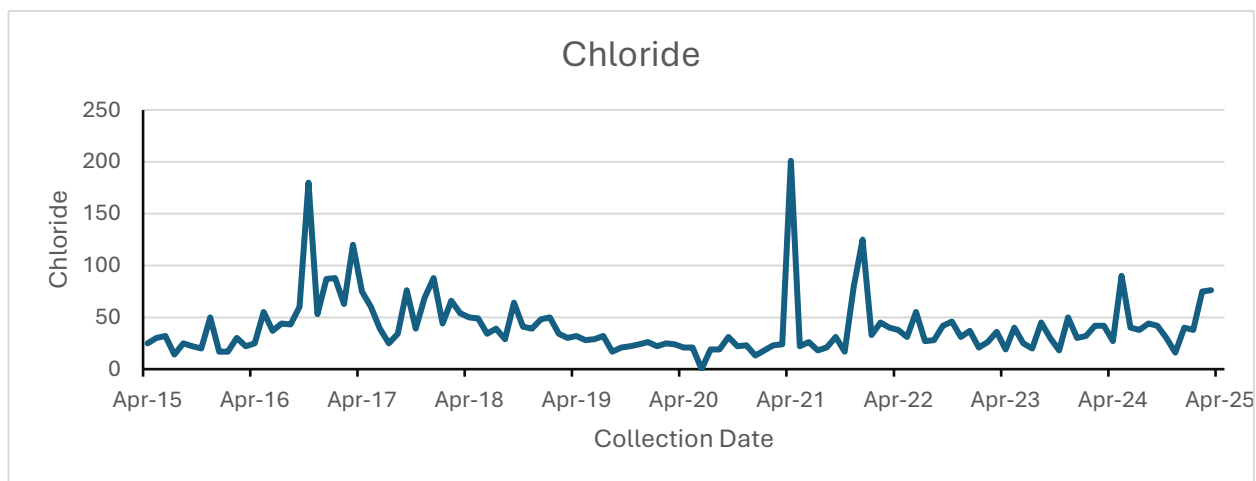


***Graph 18 Monthly variation of Dissolved Oxygen at Panetha Station (2015-2025)***

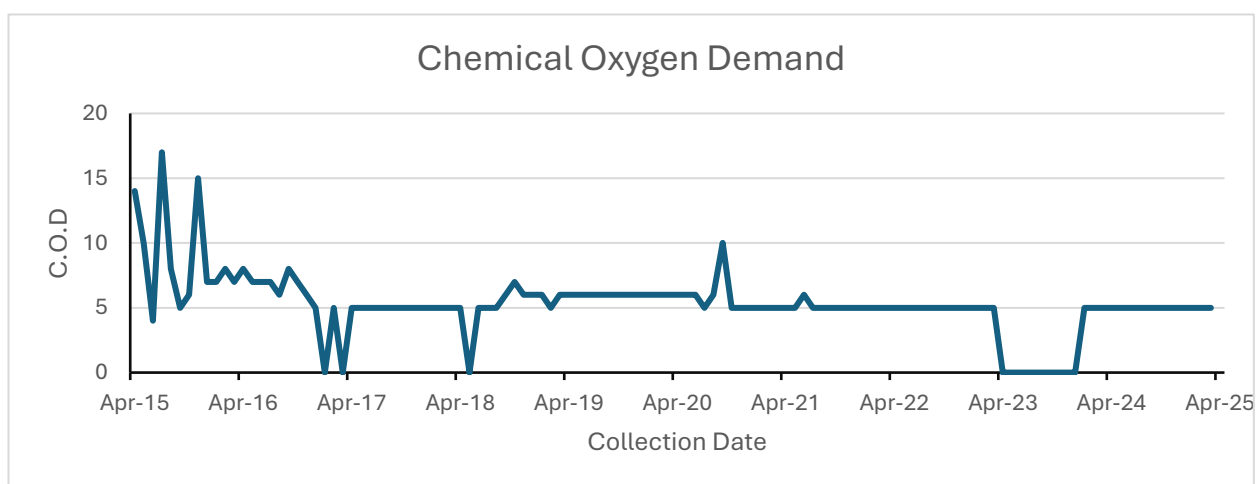


***Graph 19 Monthly variation of Conductivity at Panetha Station (2015-2025)***

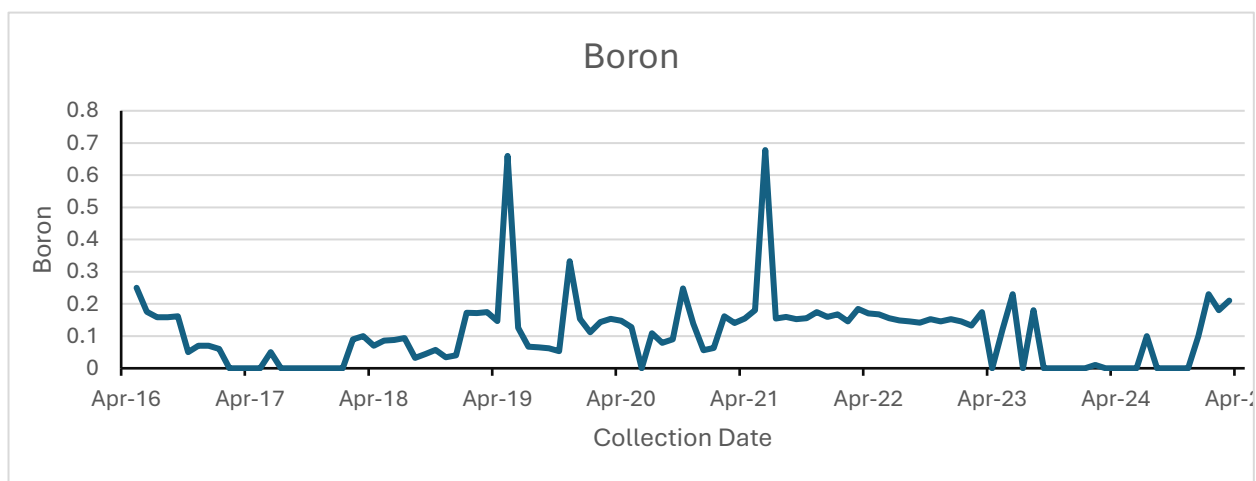




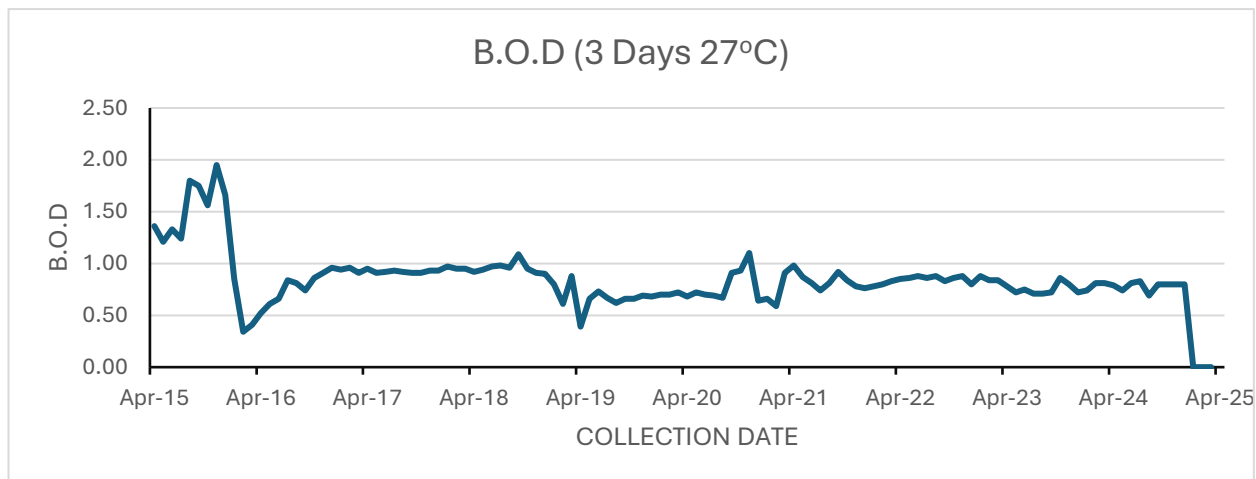
**Graph 20 Monthly variation of Chloride at Panetha Station (2015-2025)**



**Graph 21 Monthly variation of Chemical Oxygen Demand at Panetha Station (2015-2025)**



**Graph 22 Monthly variation of Boron at Panetha Station (2016-2025)**



**Graph 23 Monthly variation of B.O.D (3 Days 27°C at Panetha Station (2015-2025))**

Graph 1: The graph shows the monthly variation of *Turbidity* at Panetha Station from April 2015 to April 2025. Turbidity ranged from 0.2 to 175.8 NTU, permissible limit (BIS IS10500): 5 NTU (desirable 1 NTU), exceeds the permissible limit and requires attention.

Graph 2: The graph shows the monthly variation of *Total Hardness as CaCo<sub>3</sub>* at Panetha Station from April 2015 to April 2025. Total Hardness ranged from 86.0 to 510.0 mg/L, permissible limit (BIS IS10500): 600 mg/L (desirable 200 mg/L), within the permissible limit.

Graph 3: The graph shows the monthly variation of *Total Kjeldahl Nitrogen* at Panetha Station from April 2015 to April 2025. Total Kjeldahl Nitrogen ranged from 0.56 to 2.24 mg/L, no specific BIS drinking-water limit (reported as nutrient), reported; within typical environmental ranges.

Graph 4: The graph shows the monthly variation of *Total Dissolved Solids* at Panetha Station from April 2015 to April 2025. TDS ranged from 66.0 to 354.0 mg/L, permissible limit (BIS IS10500): 2000 mg/L (desirable 500 mg/L), well within permissible limit (but some values above desirable 500 mg/L).

Graph 5: The graph shows the monthly variation of *Temperature* at Panetha Station from April 2015 to April 2025. Temperature ranged from 25.0 to 36.5 °C, no fixed BIS drinking limit (reported), reported seasonal variation consistent with climate.

Graph 6: The graph shows the monthly variation of *Suspended Solids* at Panetha Station from April 2015 to April 2025. Suspended Solids ranged from 2.0 to 394.0 mg/L, no direct BIS drinking-water limit (STP reuse norms often use TSS ≤ 20 mg/L), periodic spikes observed (monsoon); some values above common STP reuse benchmarks.

Graph 7: The graph shows the monthly variation of *Sulphate* at Panetha Station from April 2015 to April 2025. Sulphate ranged from 3.0 to 92.0 mg/L, permissible limit (BIS IS10500): 200 mg/L, within permissible limit.

Graph 8: The graph shows the monthly variation of *Sodium* at Panetha Station from April 2015 to April 2025. Sodium ranged from 3.0 to 335.0 mg/L, no strict BIS numeric limit (reported; guideline values often ~200 mg/L), within typical reporting/guideline ranges.

Graph 9: The graph shows the monthly variation of *Potassium* at Panetha Station from April 2015 to April 2025. Potassium ranged from 0.2 to 25.0 mg/L, with no specific BIS limit (reported), within normal environmental concentrations.

Graph 10: The graph shows the monthly variation of *Phosphate* at Panetha Station from April 2015 to April 2025. Phosphate ranged from 0.01 to 0.45 mg/L, no specific BIS drinking limit (nutrient environmental concern when elevated), levels mostly low; occasional monsoon rises.

Graph 11: The graph shows the monthly variation of *pH* at Panetha Station from April 2015 to April 2025. pH ranged from 6.6 to 8.4, permissible limit (BIS IS10500): 6.5–8.5 (no relaxation), within permissible limits.

Graph 12: The graph shows the monthly variation of *Nitrite* at Panetha Station from April 2016 to April 2025. Nitrite ranged from 0.01 to 0.95 mg/L, permissible limit (BIS IS10500): 0.2 mg/L (permissible), at or below permissible limit (close to limit in some months).

Graph 13: The graph shows the monthly variation of *Nitrate* at Panetha Station from April 2015 to April 2025. Nitrate ranged from 0.03 to 1.87 mg/L, permissible limit (BIS IS10500): 45 mg/L, exceeds the permissible limit in some months and requires attention.

Graph 14: The graph shows the monthly variation of *Magnesium* at Panetha Station from April 2015 to April 2025. Magnesium ranged from 4.0 to 180.0 mg/L, no separate BIS numeric limit (contributes to hardness), exceeds permissible limit in some areas.

Graph 15: The graph shows the monthly variation of *Fluoride* at Panetha Station from April 2015 to April 2025. Fluoride ranged from 0.06 to 2.30 mg/L, permissible limit (BIS IS10500): 1.5 mg/L (permissible; desirable 1.0 mg/L), within permissible limit.

Graph 16: The graph shows the monthly variation of *Fixed Dissolved Solids* at Panetha Station from April 2015 to April 2025. Fixed Dissolved Solids ranged from 34 to 256 (data merged with TDS), see TDS above, reported with TDS, within permissible limits.

Graph 17: The graph shows the monthly variation of *Fecal Coliform* at Panetha Station from April 2015 to April 2025. Fecal Coliform ranged from 2 to 40 MPN/100mL, permissible limit (BIS IS10500 for drinking): 0 MPN/100mL, well above drinking-water limits; indicates microbial contamination (especially monsoon).

Graph 18: The graph shows the monthly variation of *Dissolved Oxygen* at Panetha Station from April 2015 to April 2025. DO ranged from 6.32 to 11.38 mg/L, CPCB ecological guideline:  $DO \geq 6$  mg/L for good water, mostly meets ecological criteria though some months dip slightly below.

Graph 19: The graph shows the monthly variation of *Conductivity* at Panetha Station from April 2015 to April 2025. Conductivity ranged from 120 to 758  $\mu$ S/cm, no direct BIS limit (reported), shows seasonal/point-source variability; some high values reflect higher ionic load.

Graph 20: The graph shows the monthly variation of *Chloride* at Panetha Station from April 2015 to April 2025. Chloride ranged from 13 to 201 mg/L, permissible limit (BIS IS10500): 250 mg/L (desirable  $\sim$ 200 mg/L), within permissible range.

Graph 21: The graph shows the monthly variation of *Chemical Oxygen Demand (COD)* at Panetha Station from April 2015 to April 2025. COD ranged from 4 to 17.0 mg/L, no BIS drinking limit (effluent limits vary), shows periodic organic/chemical loading; some months are elevated.

Graph 22: The graph shows the monthly variation of *Boron* at Panetha Station from April 2016 to April 2025. Boron ranged from 0.02 to 0.68 mg/L, typical BIS guidance: desirable  $\sim$ 0.5 mg/L; permissible often 2.0 mg/L, within typical drinking-water guidance.

Graph 23: The graph shows the monthly variation of *B.O.D (3 Days 27°C)* at Panetha Station from April 2015 to April 2025. BOD ranged from 0.3 to 2.0 mg/L, CPCB bathing criterion for Class B (outdoor bathing):  $BOD \leq 3$  mg/L, some months exceed the bathing standard and indicate organic pollution.

Graph 24: The graph shows the monthly variation of *Alkalinity as CaCO<sub>3</sub>* at Panetha Station from April 2015 to April 2025. Alkalinity ranged from 92 to 260.0 mg/L, no strict BIS numeric limit beyond general desirability (often 200 mg/L desirable), mostly within acceptable ranges though occasionally elevated.

## River Narmada at Panetha

The water quality at Panetha station shows moderate variation across parameters during the period April 2015 to April 2025. Panetha Station's water is chemically acceptable for many parameters (TDS, total hardness, sulphate, chloride, boron, pH and generally adequate DO) but shows clear episodic and seasonal problems that compromise safety for direct consumption: large turbidity spikes (up to 175.8 NTU) and persistent faecal coliform counts (2–40 MPN/100 mL vs drinking-water target of 0) are the most serious concerns, while nitrite (to 0.95 mg/L), fluoride (to 2.30 mg/L), elevated suspended solids and occasional high sodium/magnesium values exceed desirable limits in some months, particularly linked to seasonal discharges and runoff.

### 2.2.2. Station: Garudeshwar

Garudeshwar represents the middle-lower transitional stretch of the river and reflects a moderate water quality profile with gradual improvements. **Graph 25 to Graph 50** show the water quality parameters with time from 2015 to 2025 of Garudeshwar Station.

**Organic Pollution:** BOD and COD values show a declining trend but remain higher than Panetha, reflecting moderate organic input from tributaries and small-scale anthropogenic sources. Seasonal spikes during monsoon are observed due to stormwater runoff.

**Dissolved Oxygen:** DO remains consistently high (>5.5 mg/L), showing the river's capacity for self-purification. Slight dips occur during high-flow monsoon months.

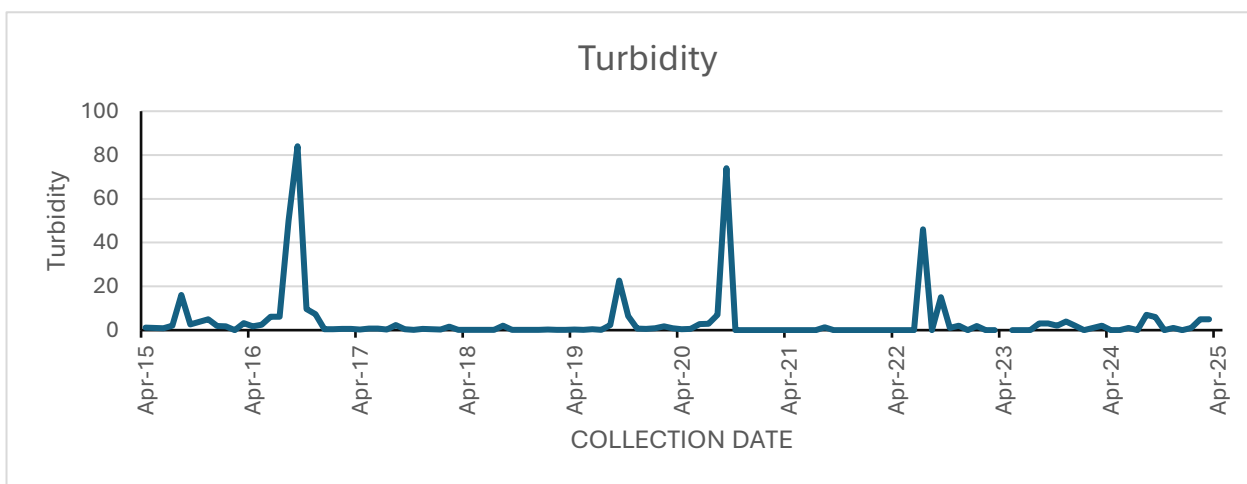
**Nutrients:** Nitrate, phosphate, and TKN levels are moderate, with phosphate increasing slightly during monsoon due to agricultural and surface runoff.

**Microbial Load:** Moderate coliform contamination occurs year-round, with higher levels during monsoon due to untreated sewage inflows from nearby settlements.

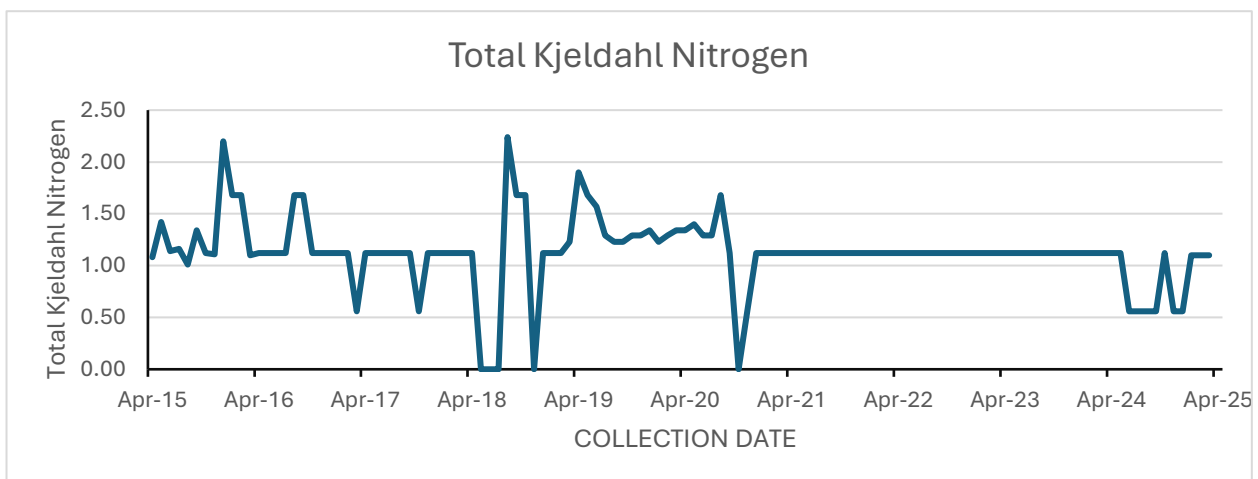
**Metals:** Most heavy metals remain within safe limits, though occasional iron increases are recorded during rainy season due to sediment disturbance.

**Salinity & Hardness:** Chloride and TDS levels remain acceptable, though seasonal variations occur.

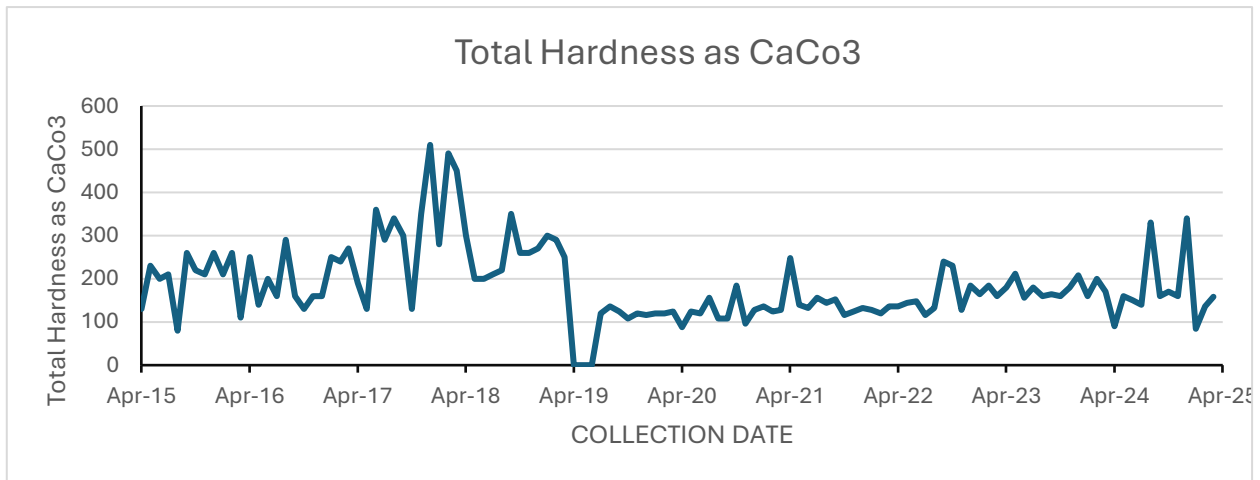
**Overall Condition:** Garudeshwar exhibits moderate to good water quality, reflecting transitional influences from upstream clean stretches and local anthropogenic inputs. Continued sewage management and nutrient control are needed.



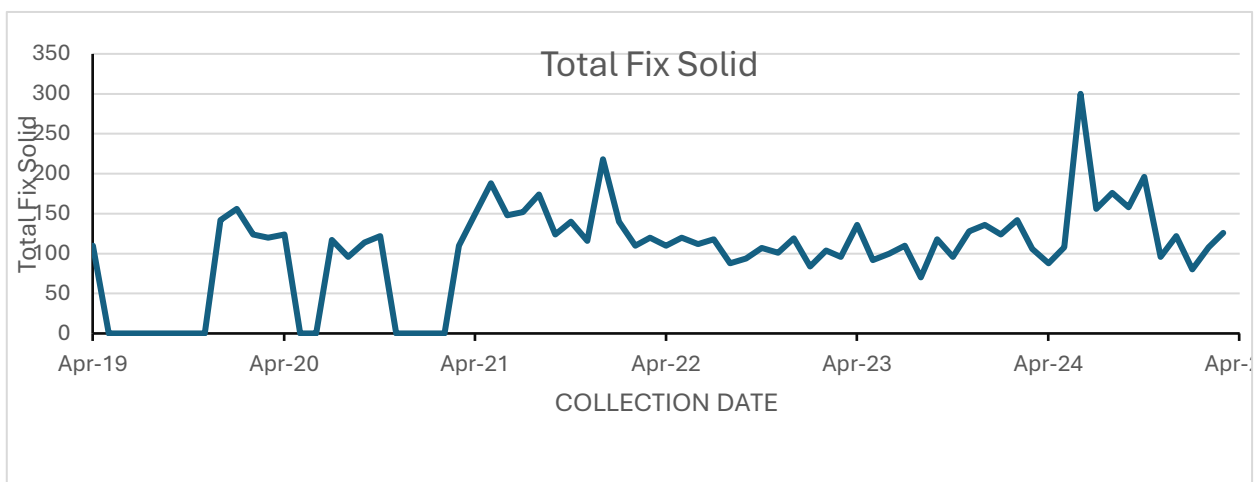
*Graph 25 Monthly variation of Turbidity at Garudeshwar Station (2015-2025)*



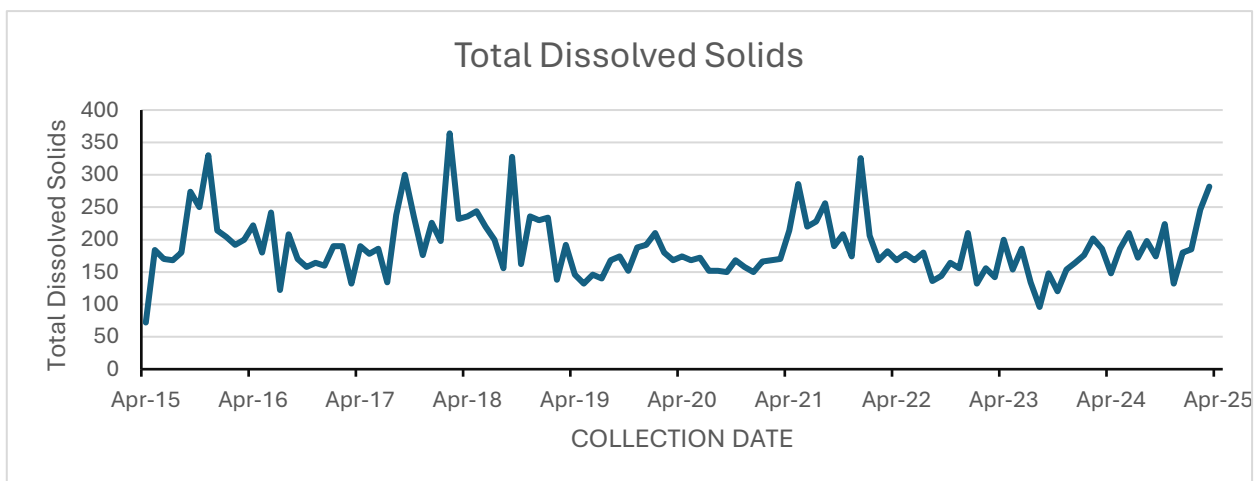
*Graph 26 Monthly variation of Total Kjeldahl Nitrogen at Garudeshwar Station (2015-2025)*



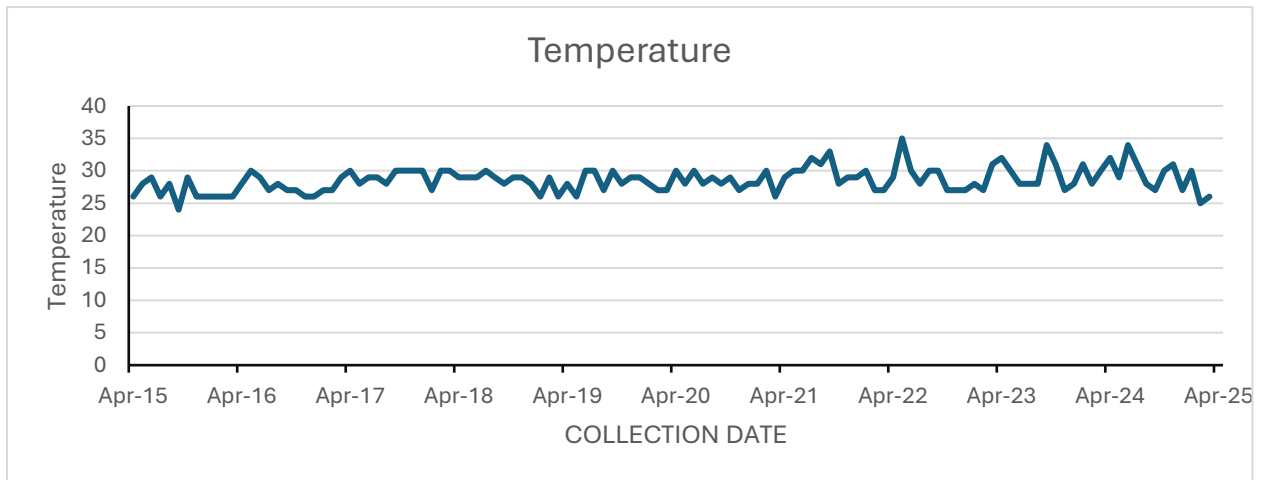
**Graph 27 Monthly variation of Total Hardness as CaCo<sub>3</sub> at Garudeshwar Station (2015-2025)**



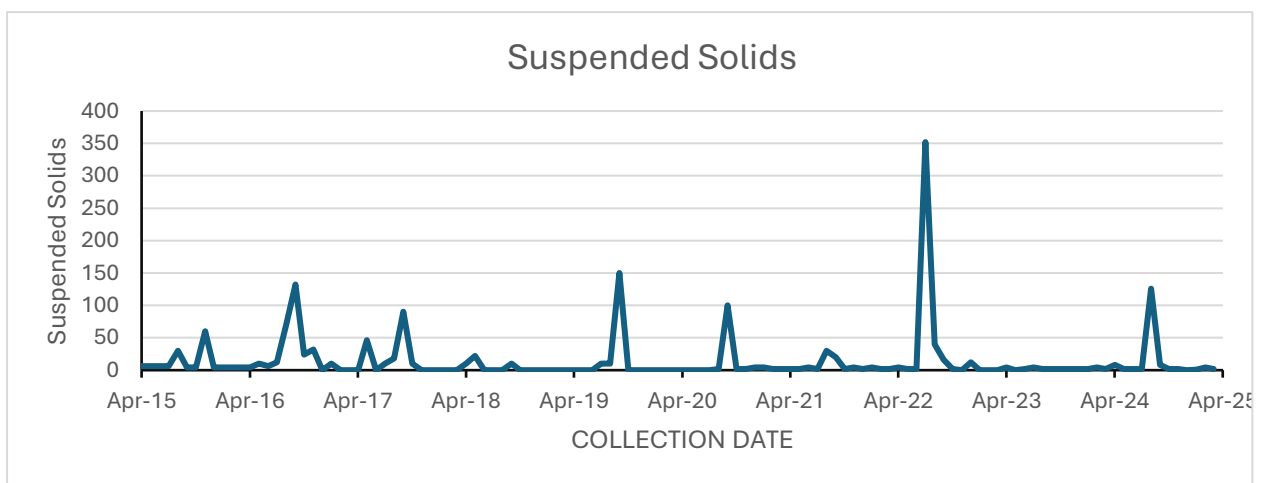
**Graph 28 Monthly variation of Total Fix Solid at Garudeshwar Station (2015-2025)**



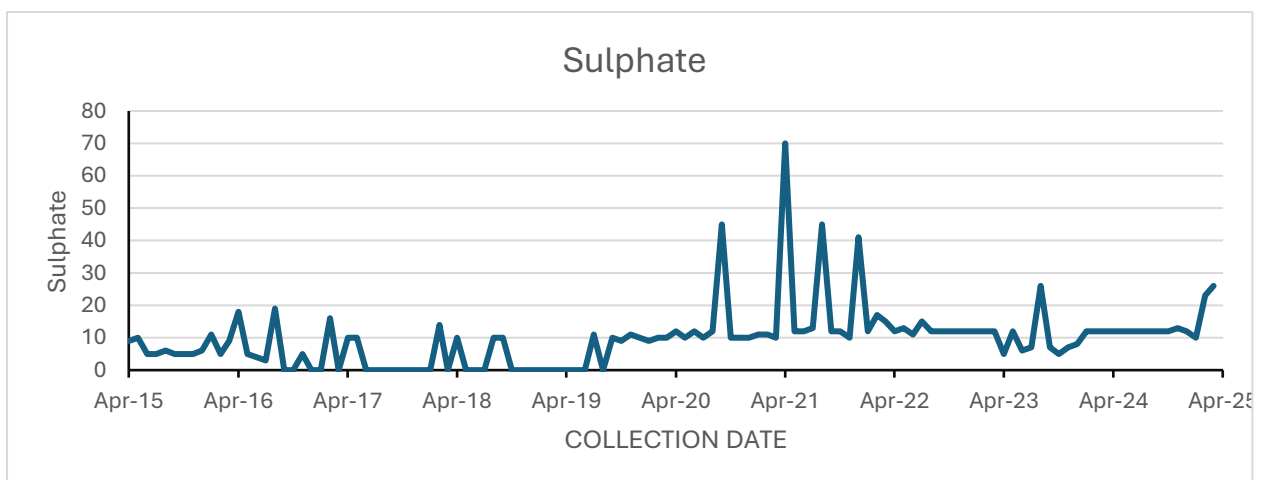
**Graph 29 Monthly variation of Total Dissolved Solids at Garudeshwar Station (2015-2025)**



***Graph 30 Monthly variation of Temperature at Garudeshwar Station (2015-2025)***

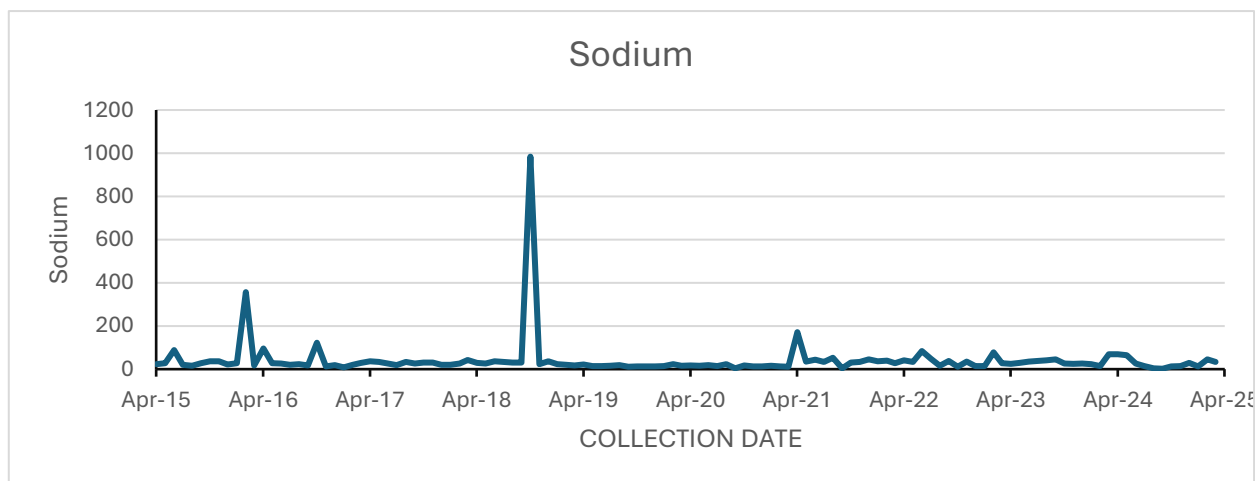


***Graph 31 Monthly variation of Suspended Solids at Garudeshwar Station (2015-2025)***

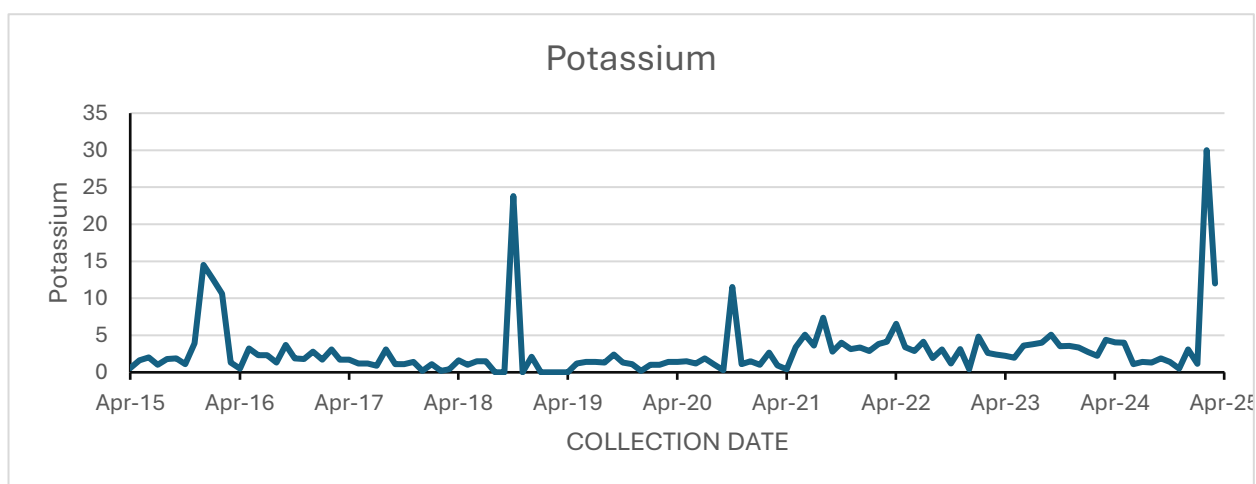


***Graph 32 Monthly variation of Sulphate at Garudeshwar Station (2015-2025)***

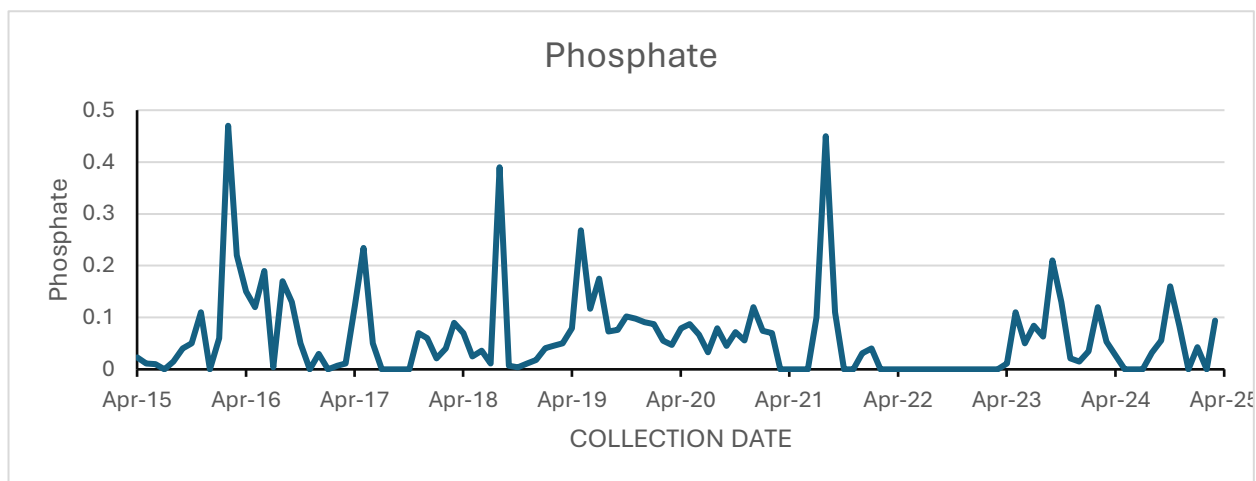




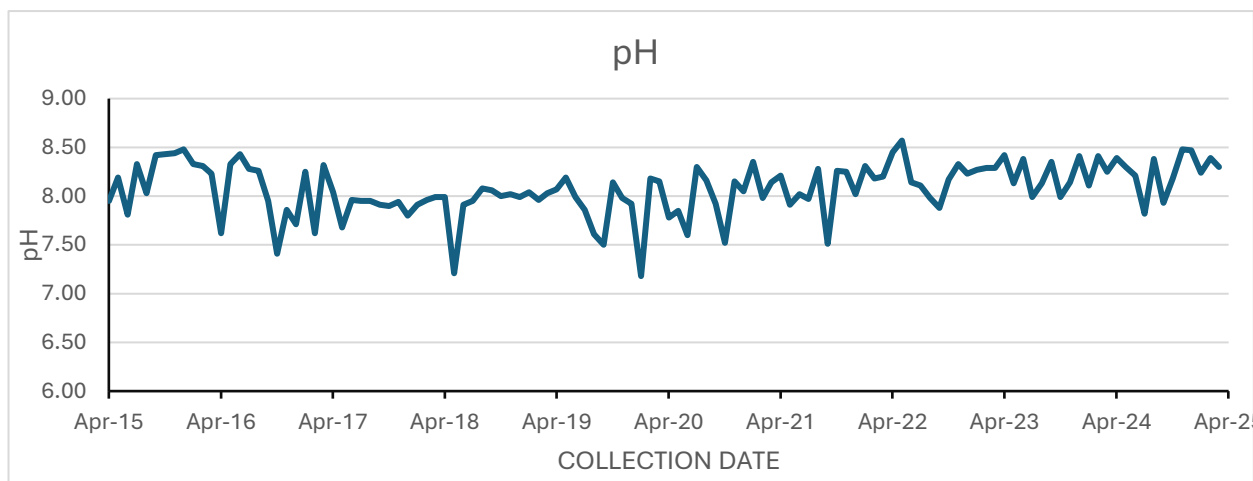
**Graph 33 Monthly variation of Sodium at Garudeshwar Station (2015-2025)**



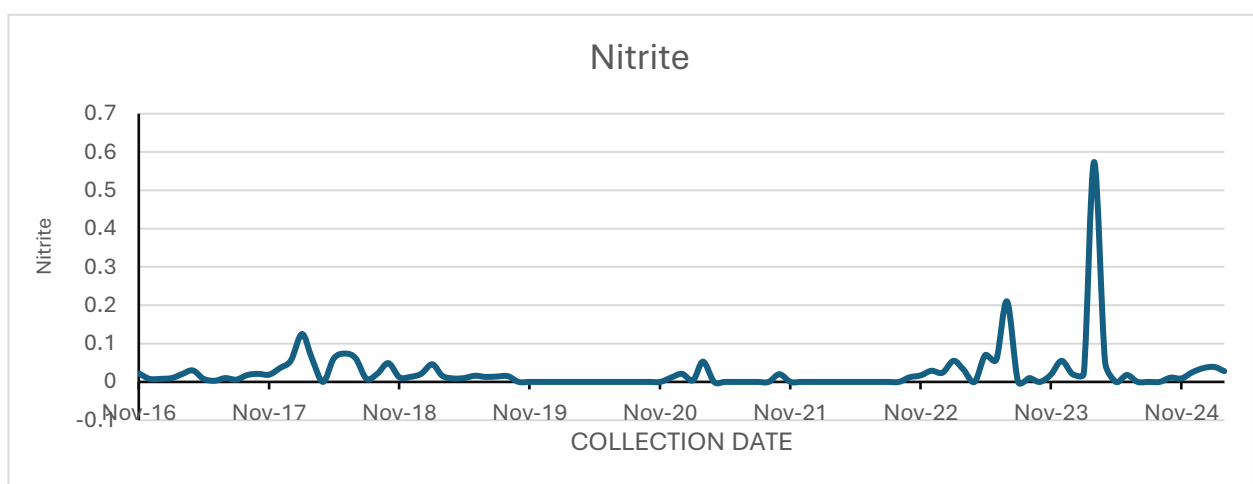
**Graph 34 Monthly variation of Potassium at Garudeshwar Station (2015-2025)**



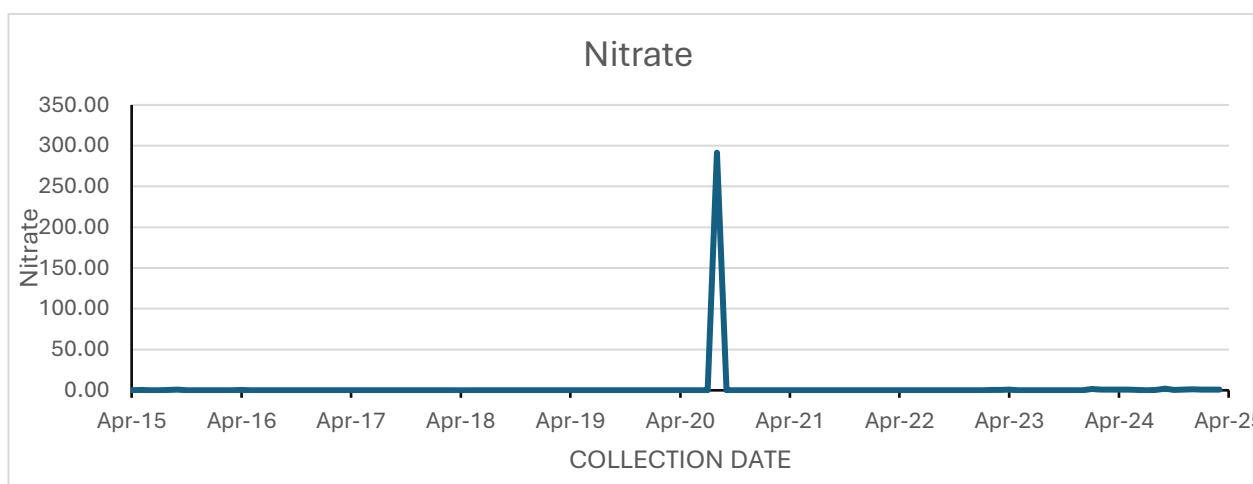
**Graph 35 Monthly variation of Phosphate at Garudeshwar Station (2015-2025)**



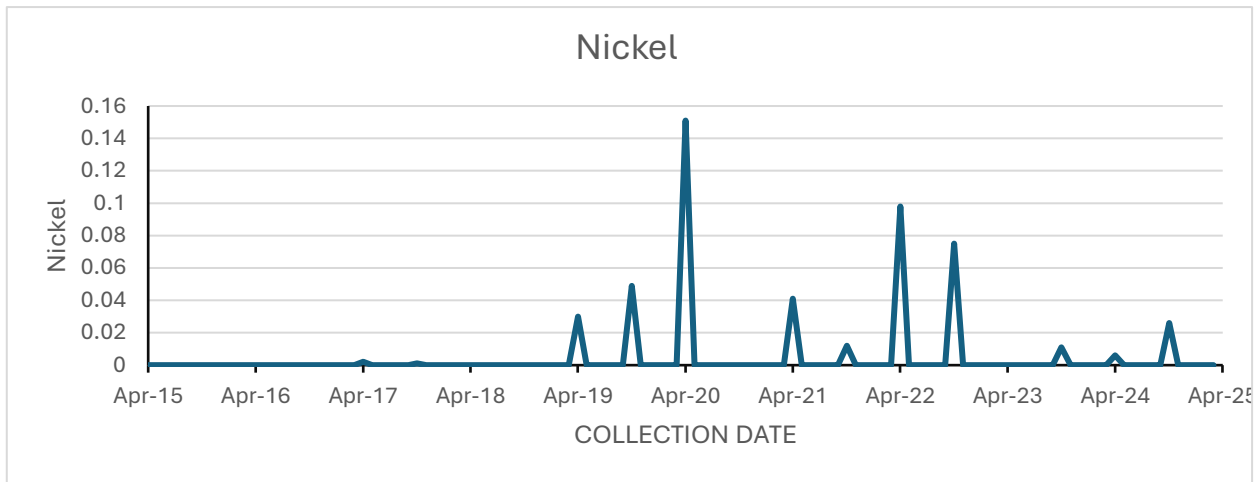
**Graph 36 Monthly variation of pH at Garudeshwar Station (2015-2025)**



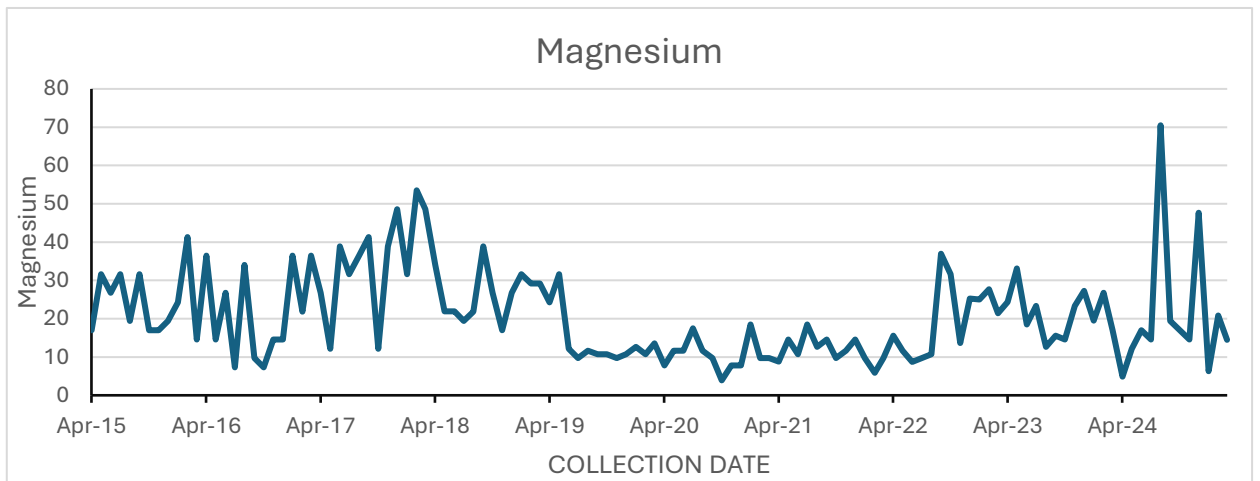
**Graph 37 Monthly variation of Nitrite at Garudeshwar Station (2015-2025)**



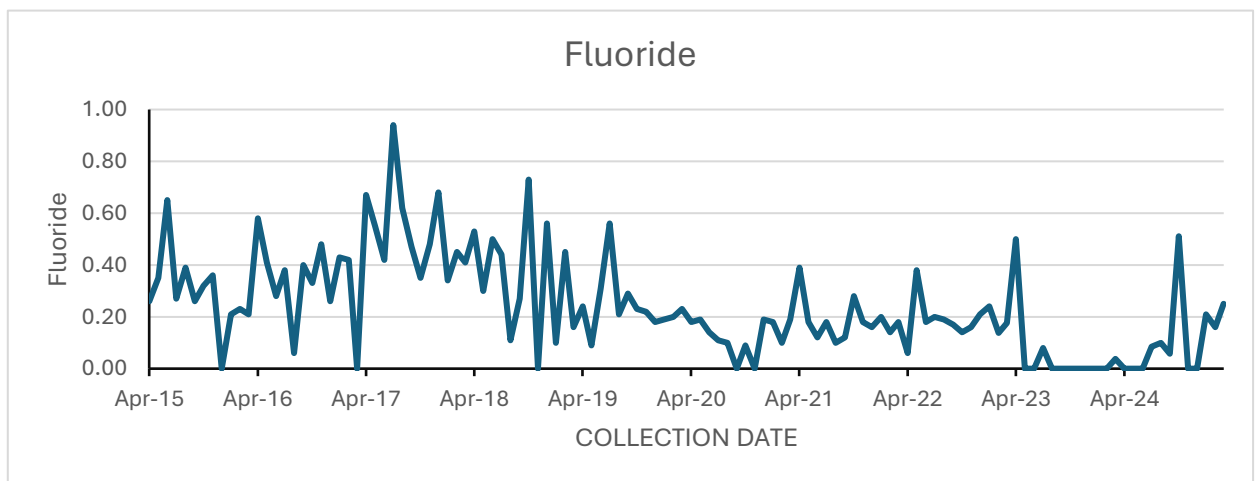
**Graph 38 Monthly variation of Nitrate at Garudeshwar Station (2015-2025)**



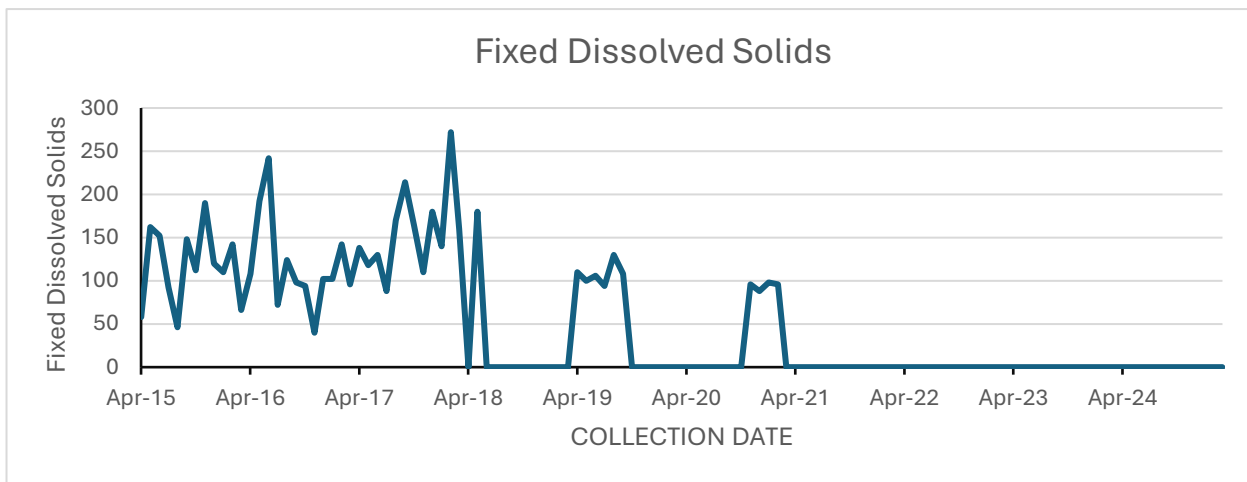
**Graph 39 Monthly variation of Nickel at Garudeshwar Station (2015-2025)**



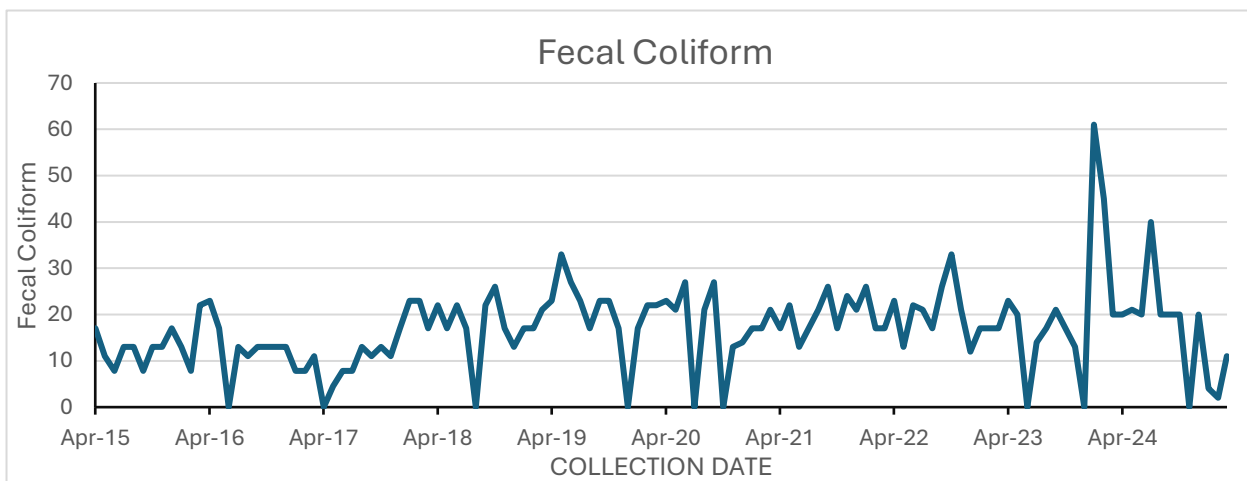
**Graph 40 Monthly variation of Magnesium at Garudeshwar Station (2015-2025)**



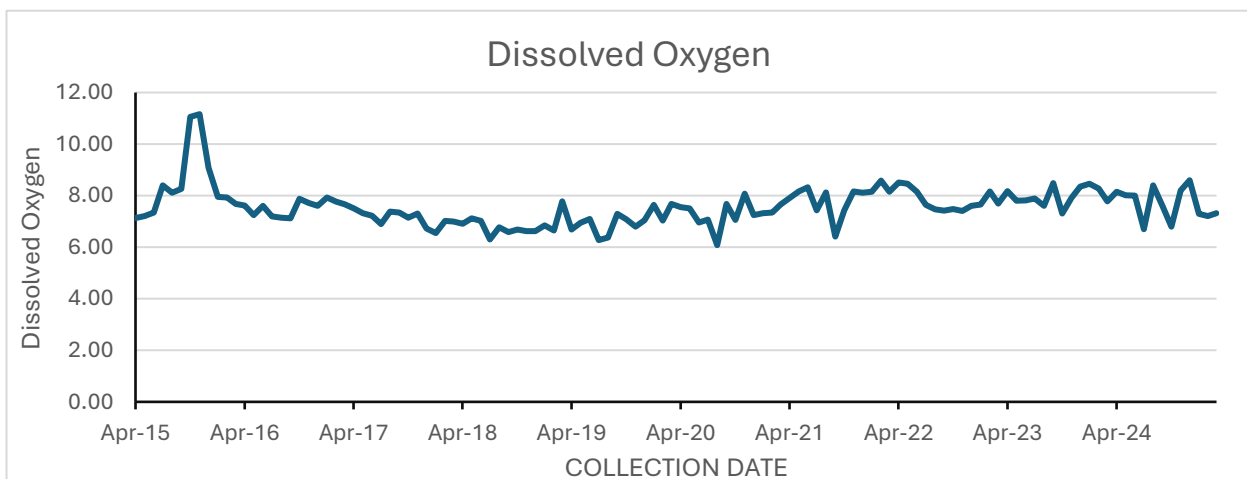
**Graph 41 Monthly variation of Fluoride at Garudeshwar Station (2015-2025)**



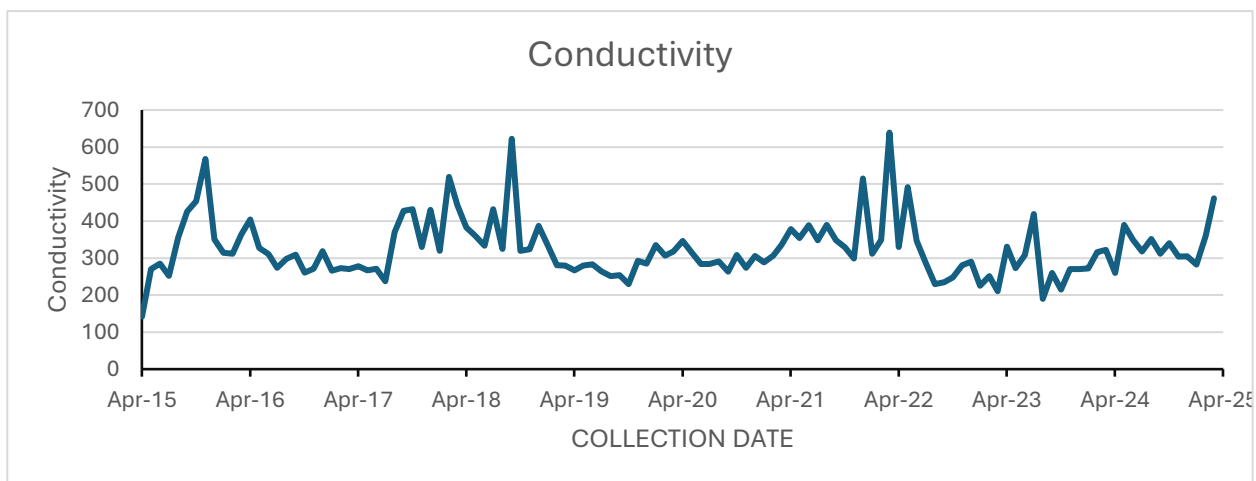
**Graph 42 Monthly variation of Fixed Dissolved Solids at Garudeshwar Station (2015-2025)**



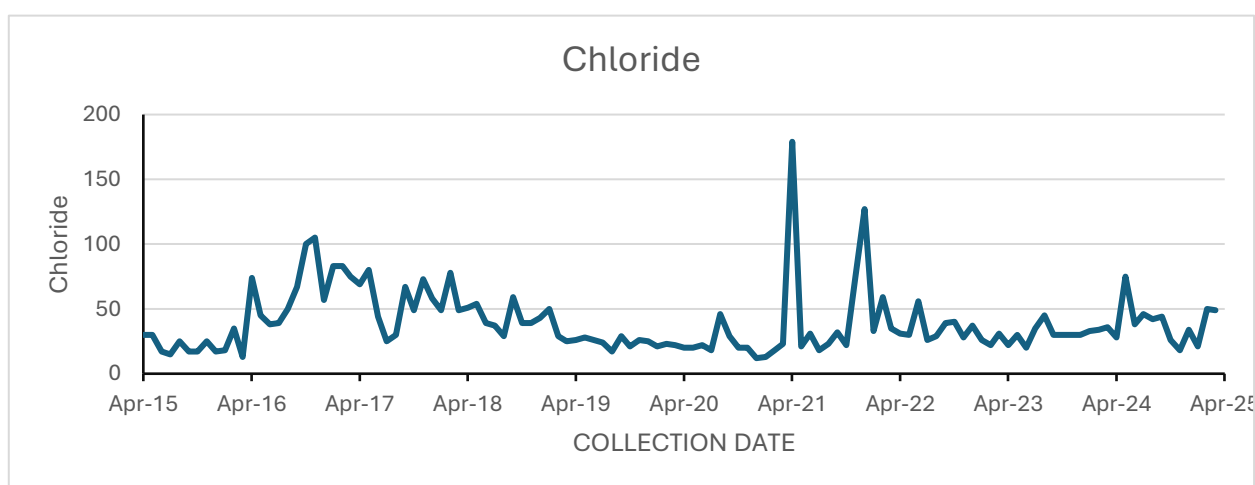
**Graph 43 Monthly variation of Fecal Coliform at Garudeshwar Station (2015-2025)**



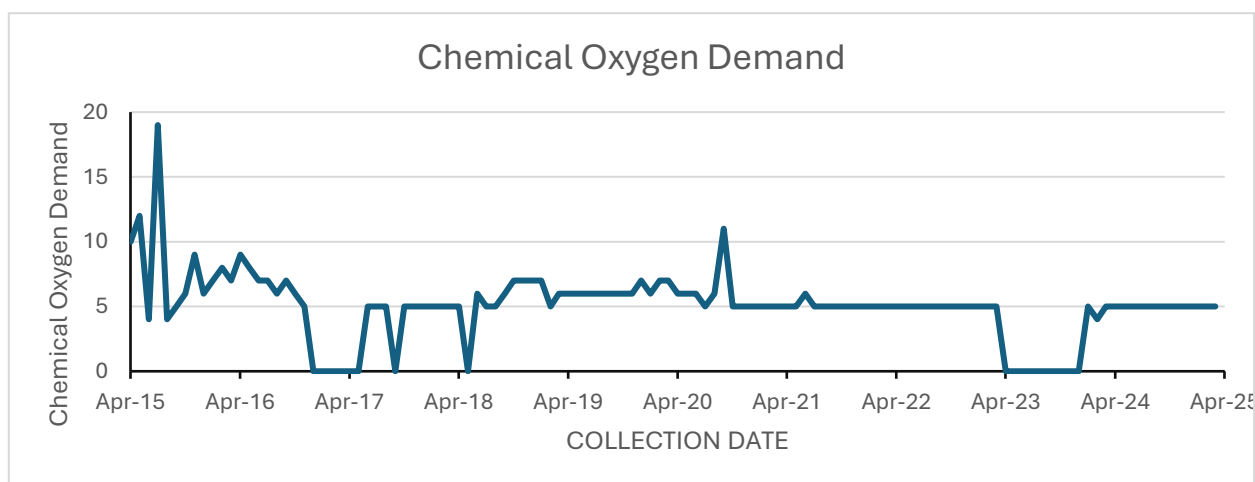
**Graph 44 Monthly variation of Dissolved Oxygen at Garudeshwar Station (2015-2025)**



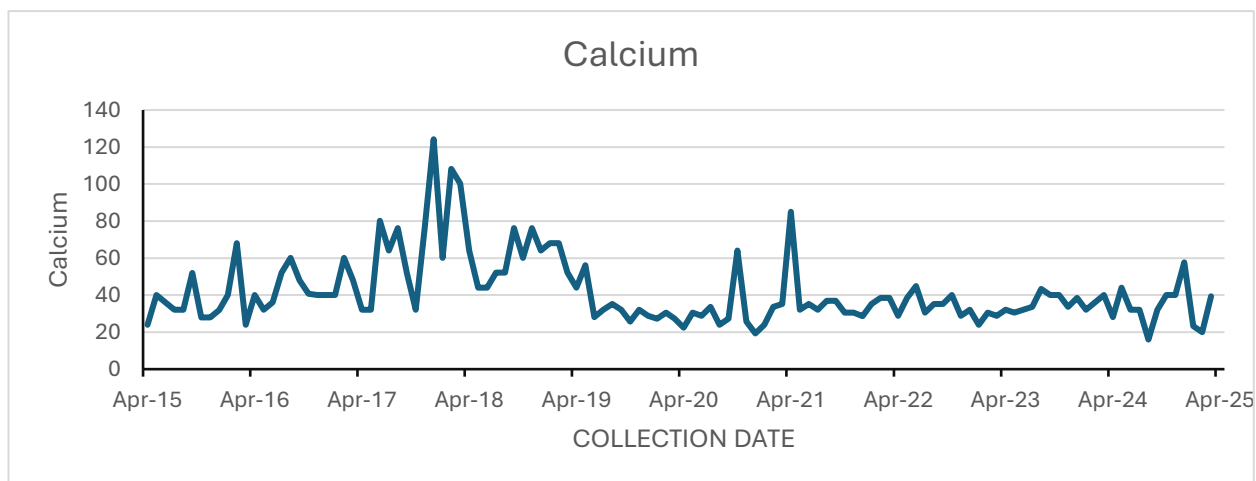
**Graph 45 Monthly variation of Conductivity at Garudeshwar Station (2015-2025)**



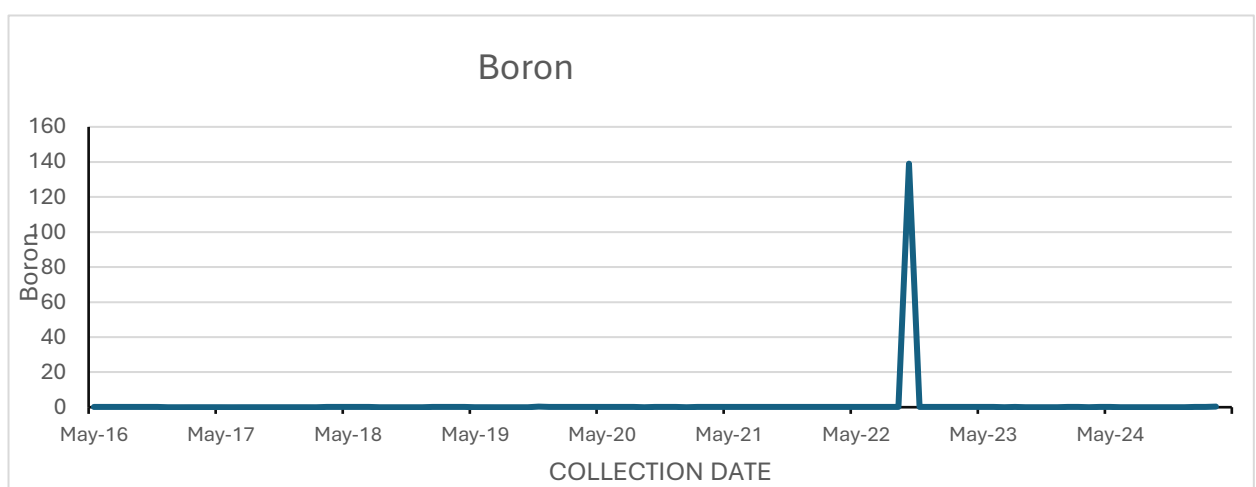
**Graph 46 Monthly variation of Chloride at Garudeshwar Station (2015-2025)**



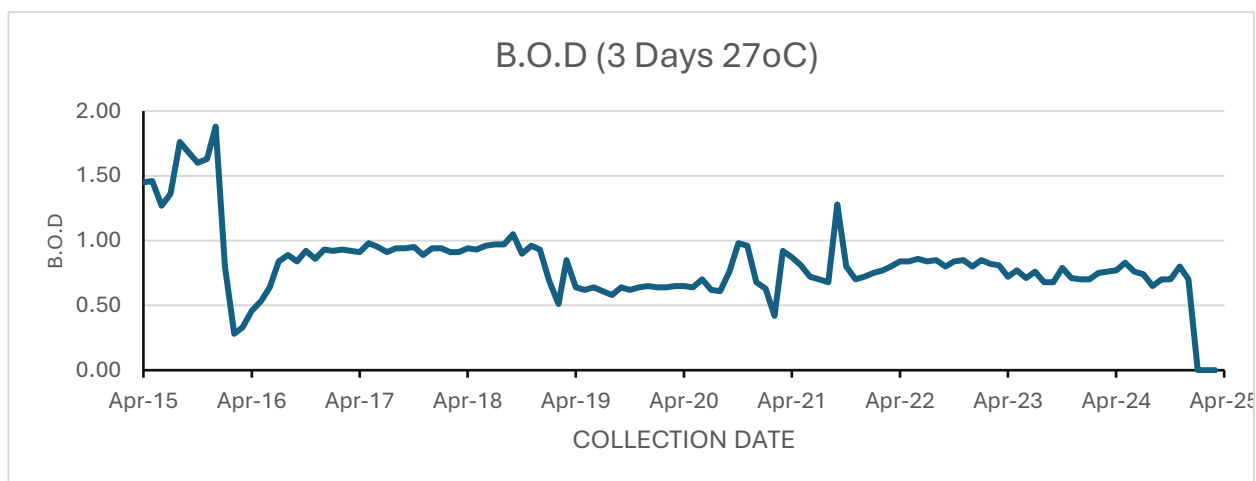
**Graph 47 Monthly variation of C.O.D. at Garudeshwar Station (2015-2025)**



***Graph 48 Monthly variation of Calcium at Garudeshwar Station (2015-2025)***



***Graph 49 Monthly variation of Boron at Garudeshwar Station (2016-2025)***



***Graph 50 Monthly variation of B.O.D (3 Days 27oC) at Garudeshwar Station (2015-2025)***

Graph 25: The graph shows the monthly variation of *Turbidity* at Garudeshwar Station from April 2015 to April 2025. Turbidity ranged from 0.1 to 84 , permissible limit (BIS IS10500): 5 NTU, very high maxima (monsoon/episodic spikes) exceeds permissible limit and requires attention.

Graph 26: The graph shows the monthly variation of *Total Kjeldahl Nitrogen* at Garudeshwar Station from April 2015 to April 2025. TKN ranged from 0.56 to 2.3 mg/L, no specific BIS drinking limit (reported), within expected environmental ranges.

Graph 27: The graph shows the monthly variation of *Total Hardness as CaCo<sub>3</sub>* at Garudeshwar Station from April 2015 to April 2025. Total Hardness ranged from 82.0 to 524.0 mg/L, permissible limit (BIS IS10500): 600 mg/L, within permissible limit.

Graph 28: The graph shows the monthly variation of *Total Fix Solid* at Garudeshwar Station from April 2015 to April 2025. Total Fixed Solids (reported similarly to TDS) ranged from 70 to 300 (see TDS), reported as part of TDS, within typical ranges.

Graph 29: The graph shows the monthly variation of *Total Dissolved Solids* at Garudeshwar Station from April 2015 to April 2025. TDS ranged from 72.0 to 364.0 mg/L, permissible limit (BIS IS10500): 2000 mg/L, well within permissible limit (but above desirable 500 mg/L in some months).

Graph 30: The graph shows the monthly variation of *Temperature* at Garudeshwar Station from April 2015 to April 2025. Temperature ranged from 24.0 to 36.0 °C, seasonal variation expected no drinking-water limit.

Graph 31: The graph shows the monthly variation of *Suspended Solids* at Garudeshwar Station from April 2015 to April 2025. Suspended Solids ranged from 1.0 to 350.0 mg/L, monsoon spikes; some months above typical STP reuse benchmarks.

Graph 32: The graph shows the monthly variation of *Sulphate* at Garudeshwar Station from April 2015 to April 2025. Sulphate ranged from 4.0 to 130.0 mg/L, permissible limit (BIS IS10500): 200 mg/L, within permissible limit.

Graph 33: The graph shows the monthly variation of *Sodium* at Garudeshwar Station from April 2015 to April 2025. Sodium ranged from 2.0 to 1000.0 mg/L, within typical guideline ranges some months above typical reuse benchmarks.

Graph 34: The graph shows the monthly variation of *Potassium* at Garudeshwar Station from April 2015 to April 2025. Potassium ranged from 0.2 to 30.0 mg/L, within typical environmental concentrations.

Graph 35: The graph shows the monthly variation of *Phosphate* at Garudeshwar Station from April 2015 to April 2025. Phosphate ranged from 0.01 to 0.45 mg/L, generally low, with seasonal rises during monsoon.

Graph 36: The graph shows the monthly variation of *pH* at Garudeshwar Station from April 2015 to April 2025. pH ranged from 7.15 to 8.57, permissible limit (BIS IS10500): 6.5–8.5, within permissible limits.

Graph 37: The graph shows the monthly variation of *Nitrite* at Garudeshwar Station from April 2015 to April 2025. Nitrite ranged from 0.01 to 0.57 mg/L, permissible limit (BIS IS10500): 0.2 mg/L, within permissible limits.

Graph 38: The graph shows the monthly variation of *Nitrate* at Garudeshwar Station from April 2015 to April 2025. Nitrate ranged from 0.6 to 291.0 mg/L, permissible limit (BIS IS10500): 45 mg/L, mostly within permissible limit though close to the threshold in some months.

Graph 39: The graph shows the monthly variation of *Nickel* at Garudeshwar Station from April 2015 to April 2025. Nickel ranged from 0.00 to 0.15 mg/L, permissible limit (BIS IS10500 for heavy metals): 0.02 mg/L, around limit in some months; monitor for heavy inputs.

Graph 40: The graph shows the monthly variation of *Magnesium* at Garudeshwar Station from April 2015 to April 2025. Magnesium ranged from 4.0 to 70.0 mg/L, within expected ranges, but some areas need improvement.

Graph 41: The graph shows the monthly variation of *Fluoride* at Garudeshwar Station from April 2015 to April 2025. Fluoride ranged from 0.04 to 1.0 mg/L, permissible limit (BIS IS10500): 1.5 mg/L, within permissible limit.

Graph 42: The graph shows the monthly variation of *Fixed Dissolved Solids* at Garudeshwar Station from April 2015 to April 2025. Fixed Dissolved Solids ranged from 40 to 272 (reported with TDS), within typical ranges.

Graph 43: The graph shows the monthly variation of *Fecal Coliform* at Garudeshwar Station from April 2015 to April 2025. Fecal Coliform ranged from 2 to 61 MPN/100mL, permissible



limit for drinking: 0 MPN/100mL, indicates microbial contamination; not acceptable for drinking without treatment.

Graph 44: The graph shows the monthly variation of *Dissolved Oxygen* at Garudeshwar Station from April 2015 to April 2025. DO ranged from 6.0 to 11 mg/L, CPCB ecological guideline:  $\text{DO} \geq 6 \text{ mg/L}$  for good water, often meets ecological guideline but occasional dips noted.

Graph 45: The graph shows the monthly variation of *Conductivity* at Garudeshwar Station from April 2015 to April 2025. Conductivity ranged from 142 to 639  $\mu\text{S/cm}$ , within typical freshwater ranges.

Graph 46: The graph shows the monthly variation of *Chloride* at Garudeshwar Station from April 2015 to April 2025. Chloride ranged from 10 to 180 mg/L, permissible limit (BIS IS10500): 250 mg/L, within permissible limit.

Graph 47: The graph shows the monthly variation of *C.O.D.* at Garudeshwar Station from April 2015 to April 2025. COD ranged from 4 to 19 mg/L, shows periodic organic/chemical loading; some months are elevated.

Graph 48: The graph shows the monthly variation of *Calcium* at Garudeshwar Station from April 2015 to April 2025. Calcium ranged from 16 to 124 mg/L, contributes to hardness; within typical ranges while some months are elevated.

Graph 49: The graph shows the monthly variation of *Boron* at Garudeshwar Station from April 2016 to April 2025. Boron ranged from 0.03 to 139 mg/L, within typical drinking-water guidance.

Graph 50: The graph shows the monthly variation of *B.O.D (3 Days 27°C)* at Garudeshwar Station from April 2015 to April 2025. BOD ranged from 0.28 to 1.88 mg/L, CPCB bathing criterion:  $\text{BOD} \leq 3 \text{ mg/L}$ , within permissible ranges.

At Garudeshwar water quality is broadly acceptable for many chemical indicators (TDS, total hardness, sulphate, chloride, pH, DO and BOD generally within ecological/permissible ranges), but it shows important episodic and chronic risks that preclude direct potable use without treatment — notable are turbidity spikes up to 84 NTU and persistent faecal coliforms (2–61 MPN/100 mL) which indicate surface runoff/sewage contamination and demand urgent attention (filtration/coagulation and disinfection). Several chemical red flags also appear intermittently: very high reported nitrate peaks (up to 291 mg/L) and nickel (to ~0.15 mg/L)

exceed drinking limits and require source-tracing and mitigation, and extreme sodium episodes (to 1000 mg/L) affect usability of the water.

### 2.2.3. Station: Zantor

Zantor is located further downstream and benefits from dilution effects but is still influenced by localized activities. **Graph 51 to Graph 77** show the water quality parameters with time from 2015 to 2025 of Zantor Station.

**Organic Pollution:** BOD and COD are low and improving, reflecting reduced pollution loads. Monsoon periods bring temporary increases due to runoff, but these return to baseline quickly.

**Dissolved Oxygen:** DO levels remain high and stable ( $>6$  mg/L), sustaining aquatic biodiversity.

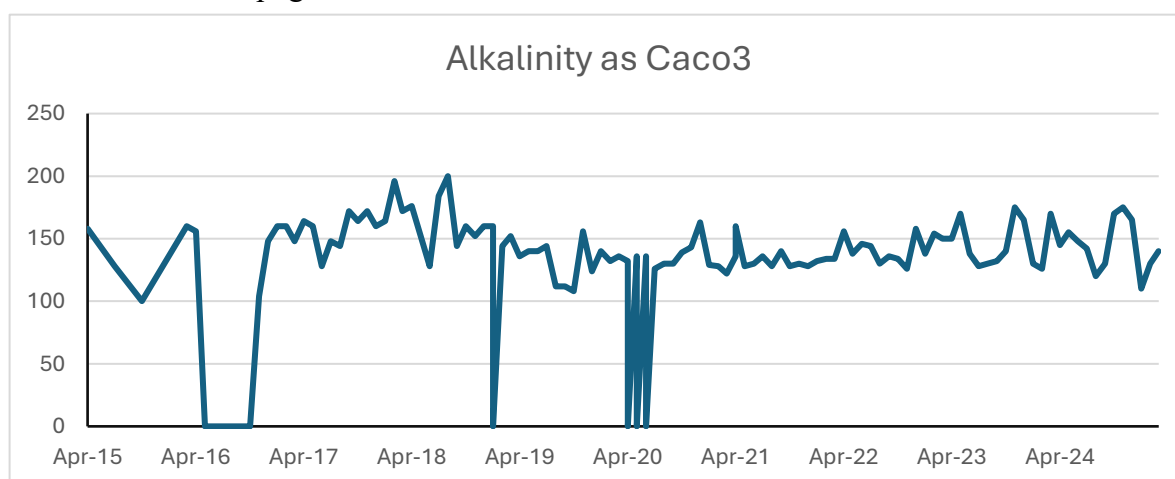
**Nutrients:** Nitrate and TKN are moderate year-round. Seasonal phosphate peaks occur in monsoon, but concentrations remain within acceptable limits.

**Microbial Load:** Moderate coliform presence is observed, increasing during monsoon due to inflows from nearby agricultural areas and domestic sewage.

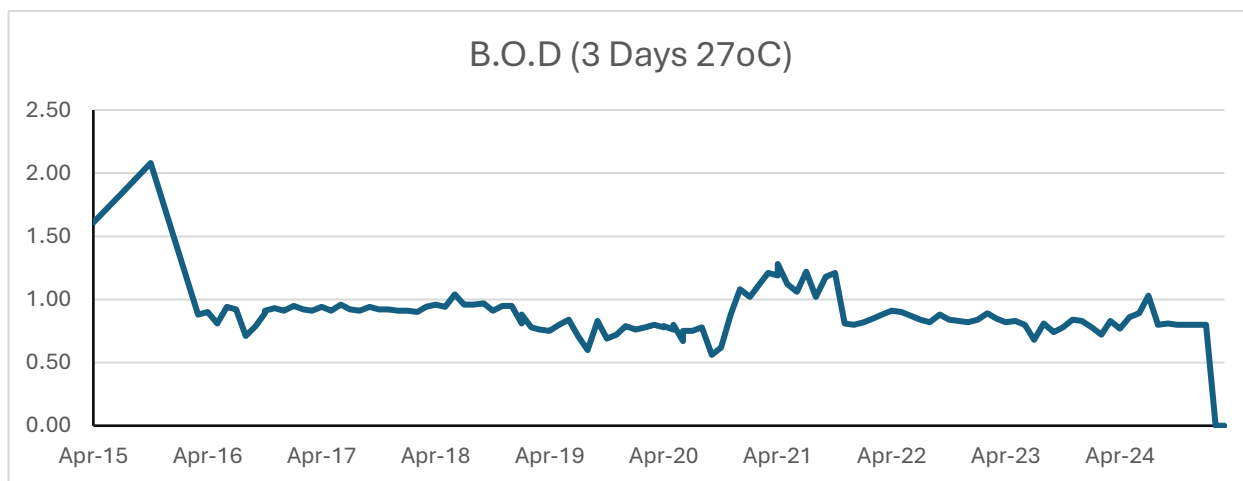
**Metals:** Heavy metals are generally absent or within safe limits; iron occasionally reaches moderate levels during high flow periods.

**Salinity & Hardness:** Chloride, conductivity, and hardness are stable and acceptable, with no salinity hazards.

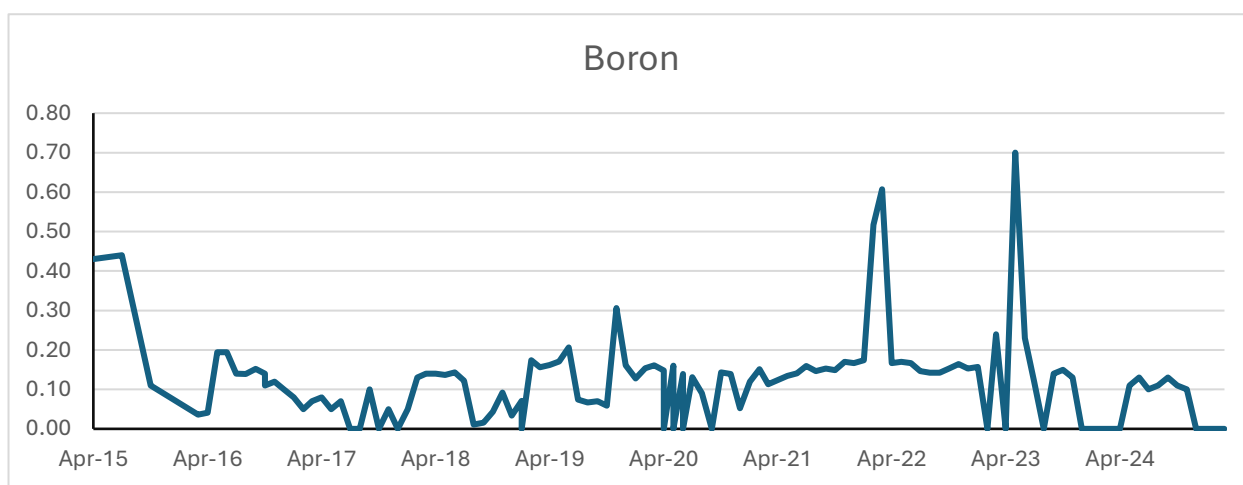
**Overall Condition:** Zantor demonstrates good water quality, showing better conditions than Garudeshwar, with minor seasonal microbial concerns. It benefits from natural purification and reduced direct anthropogenic stress.



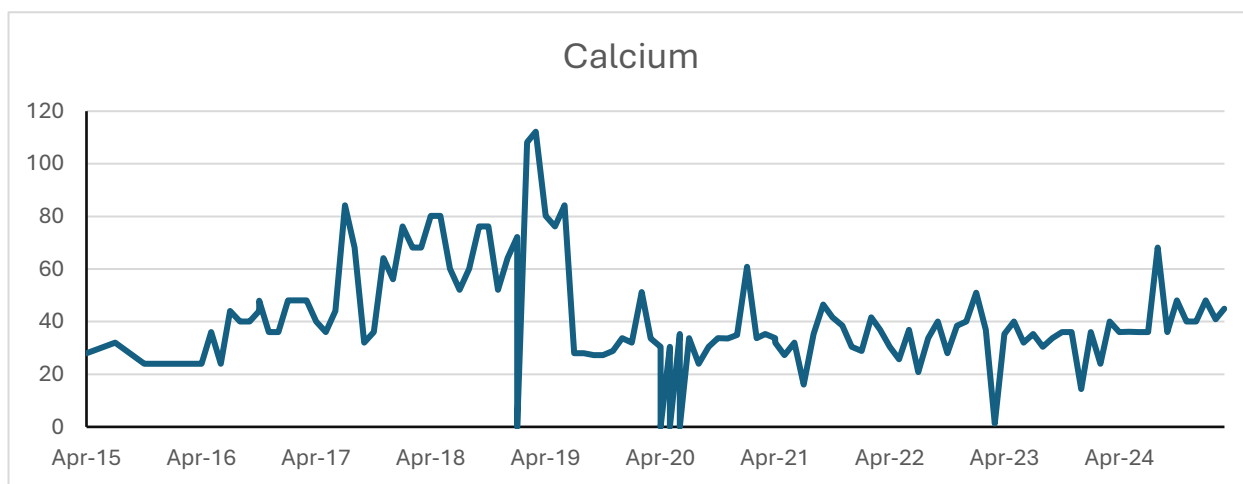
**Graph 51 Monthly variation of Alkalinity as CaCo3 at Zantor Station (2015-2025)**



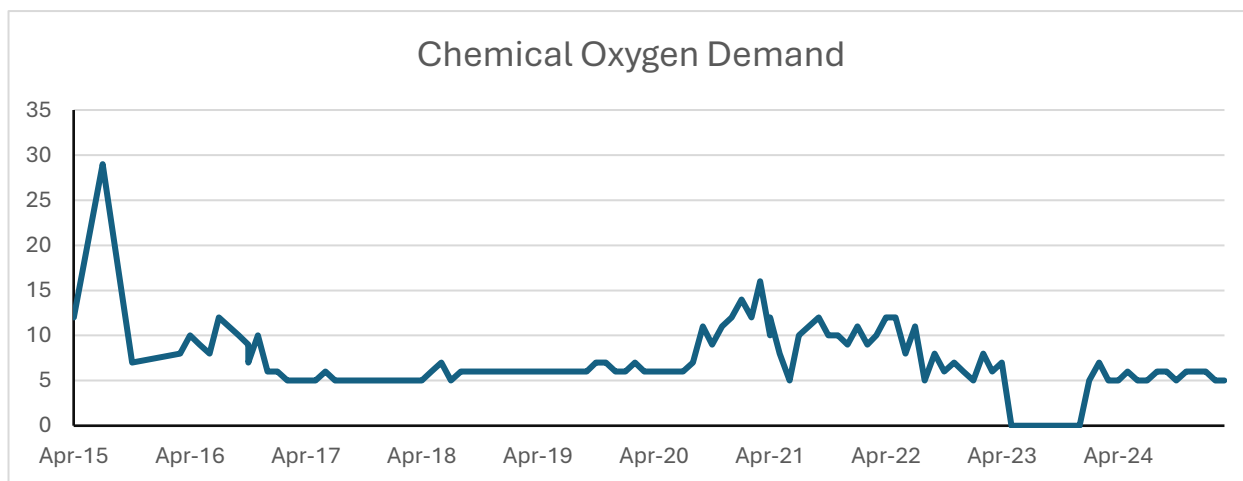
**Graph 52 Monthly variation of B.O.D. (3 Days 27 °C at Zanor Station (2015-2025))**



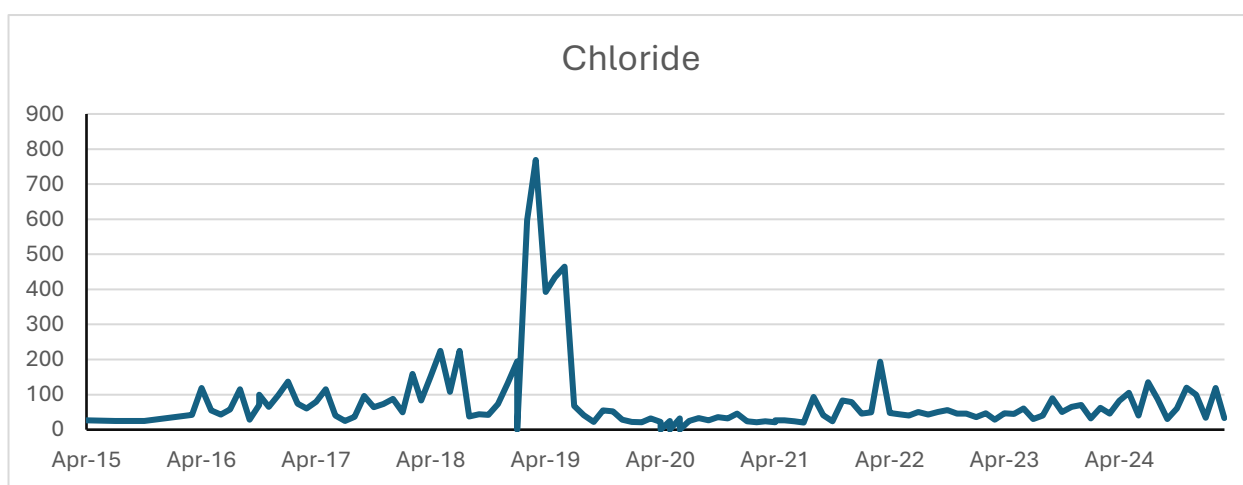
**Graph 53 Monthly variation of Boron at Zanor Station (2015-2025)**



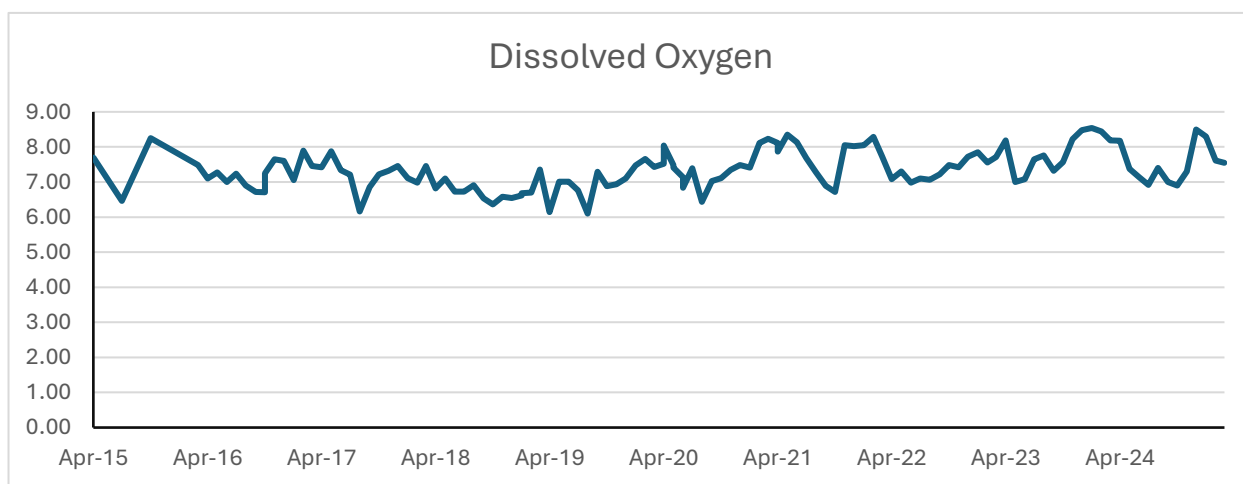
**Graph 54 Monthly variation of Calcium at Zanor Station (2015-2025)**



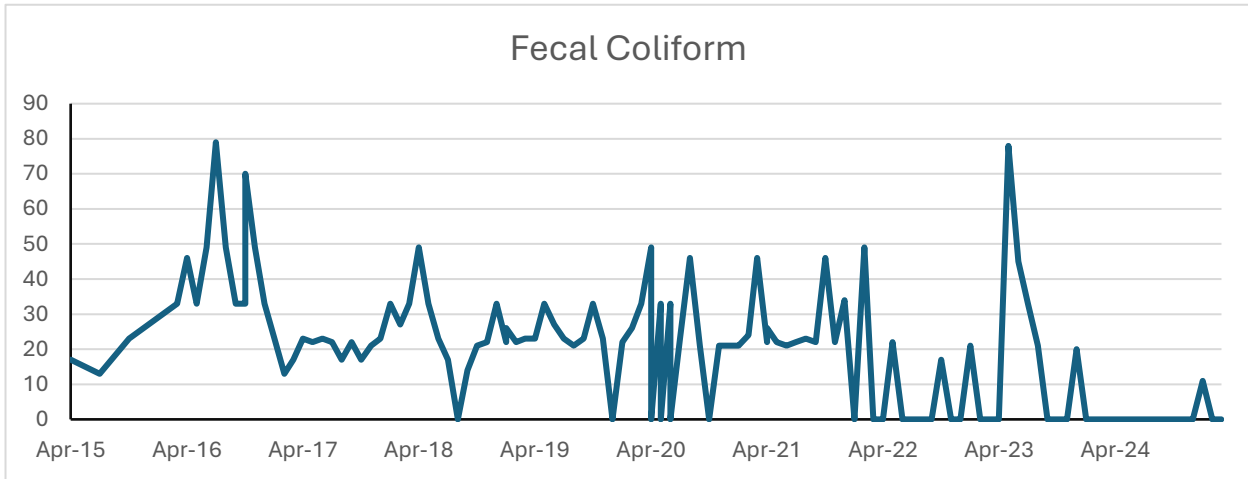
***Graph 55 Monthly variation of Chemical Oxygen Demand at Zanor Station (2015-2025)***



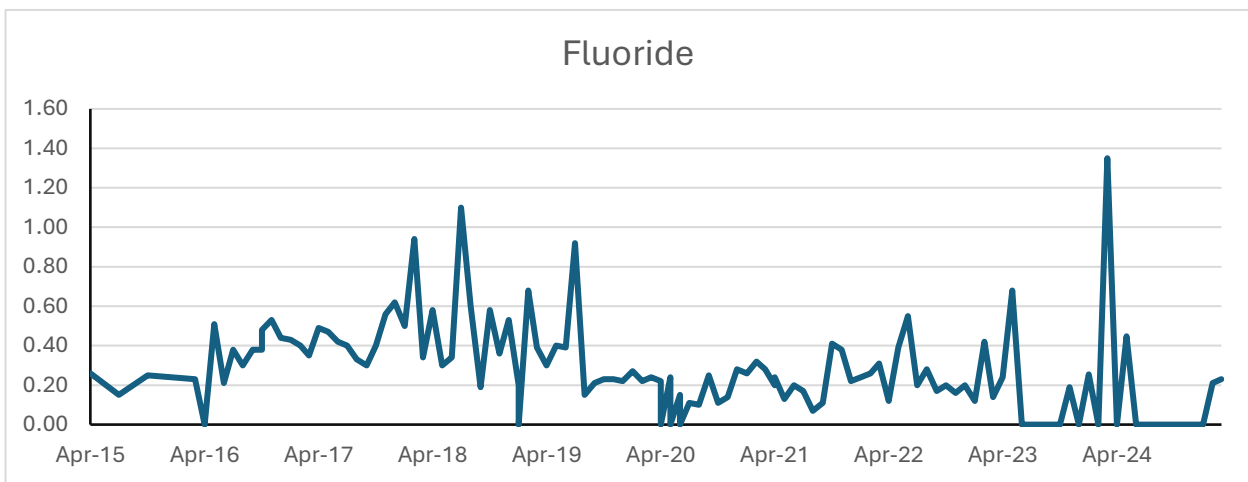
***Graph 56 Monthly variation of Chloride at Zanor Station (2015-2025)***



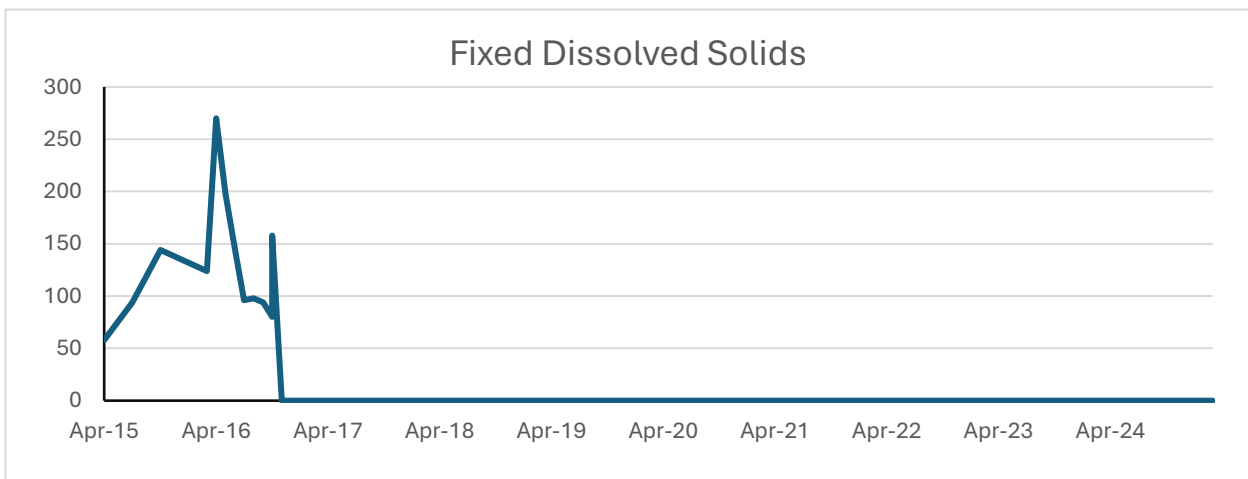
***Graph 57 Monthly variation of Dissolved Oxygen at Zanor Station (2015-2025)***



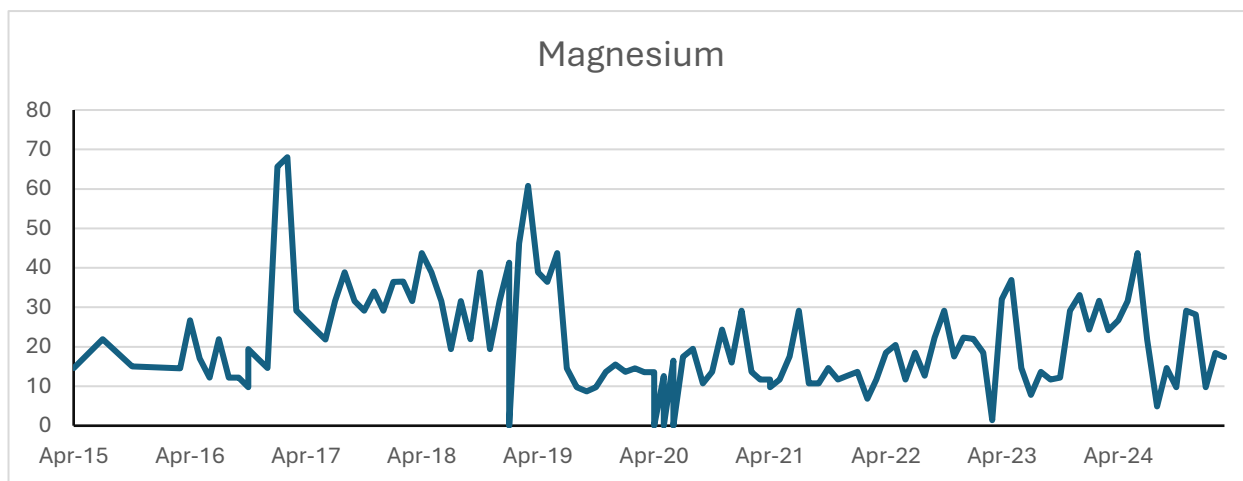
***Graph 58 Monthly variation of Fecal Coliform at Zanor Station (2015-2025)***



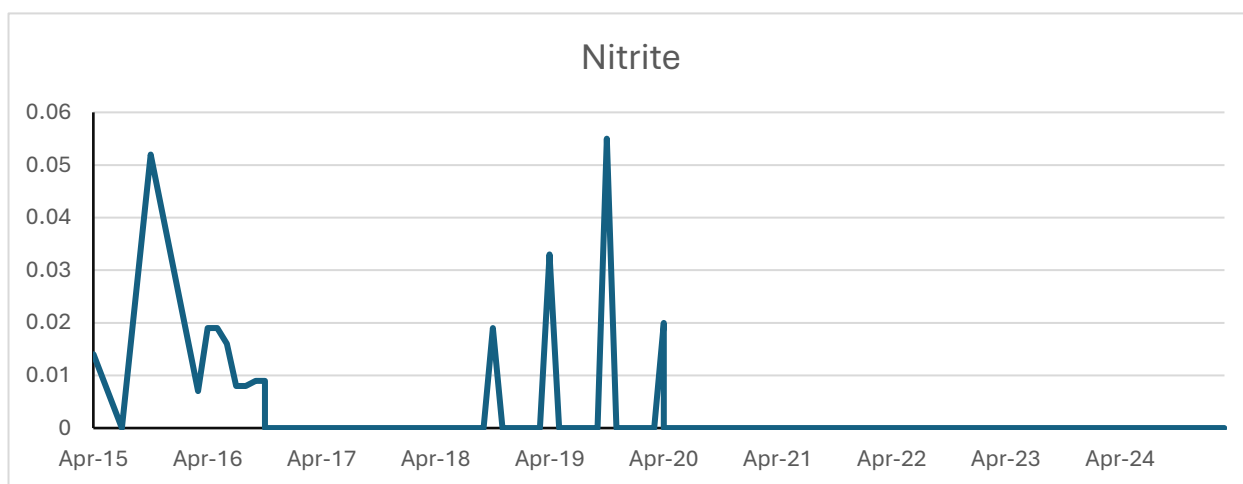
***Graph 59 Monthly variation of Fluoride at Zanor Station (2015-2025)***



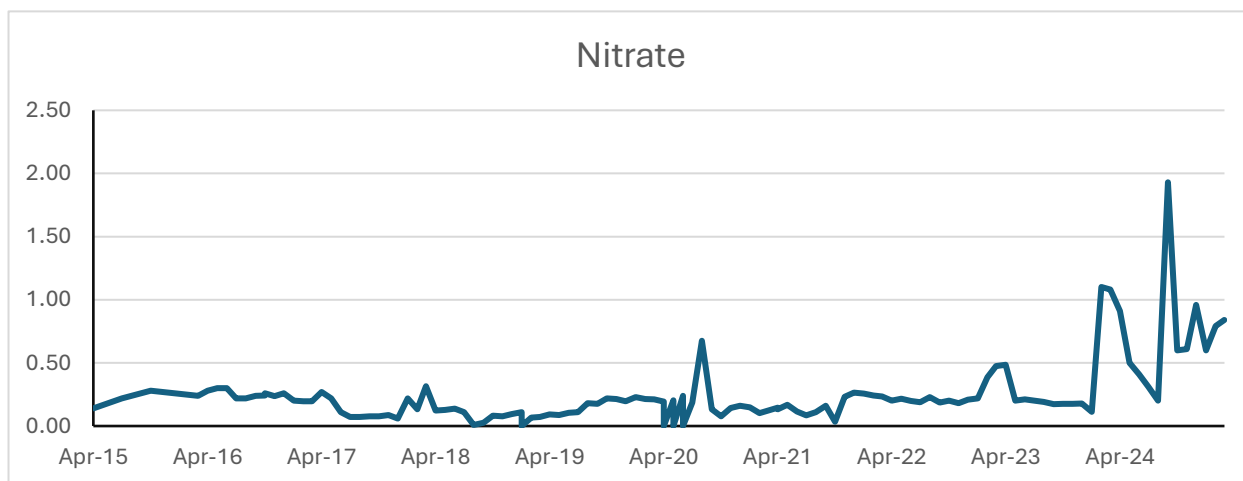
***Graph 60 Monthly variation of Fixed Dissolved Solids at Zanor Station (2015-2025)***



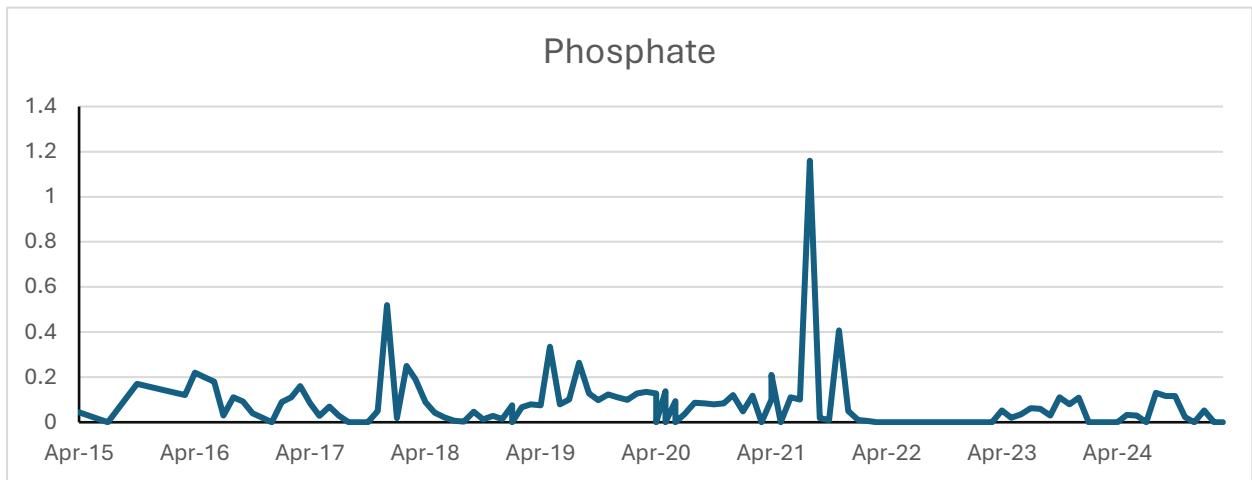
**Graph 61 Monthly variation of Magnesium at Zantor Station (2015-2025)**



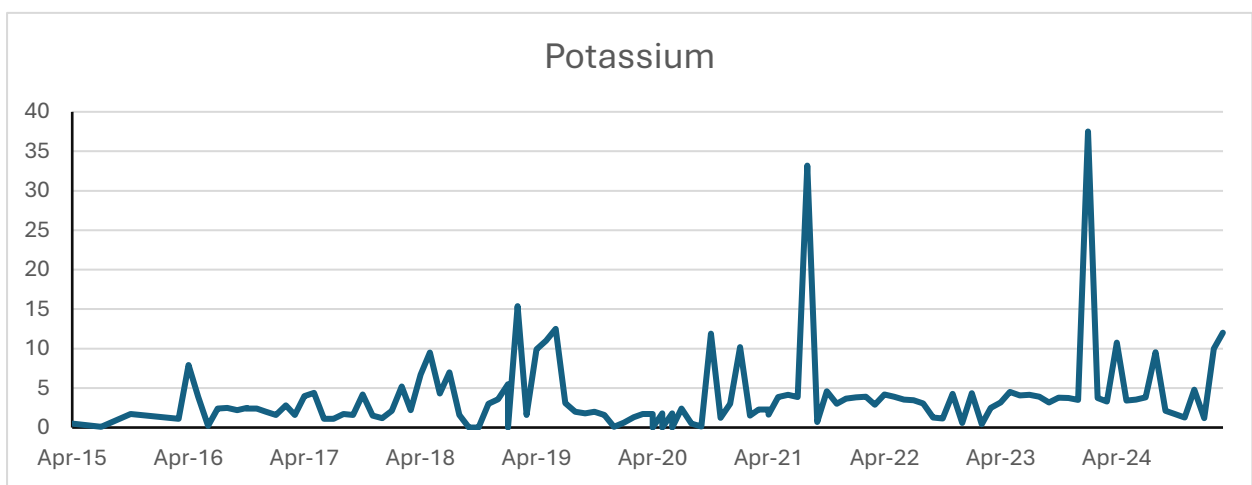
**Graph 62 Monthly variation of Nitrite at Zantor Station (2015-2025)**



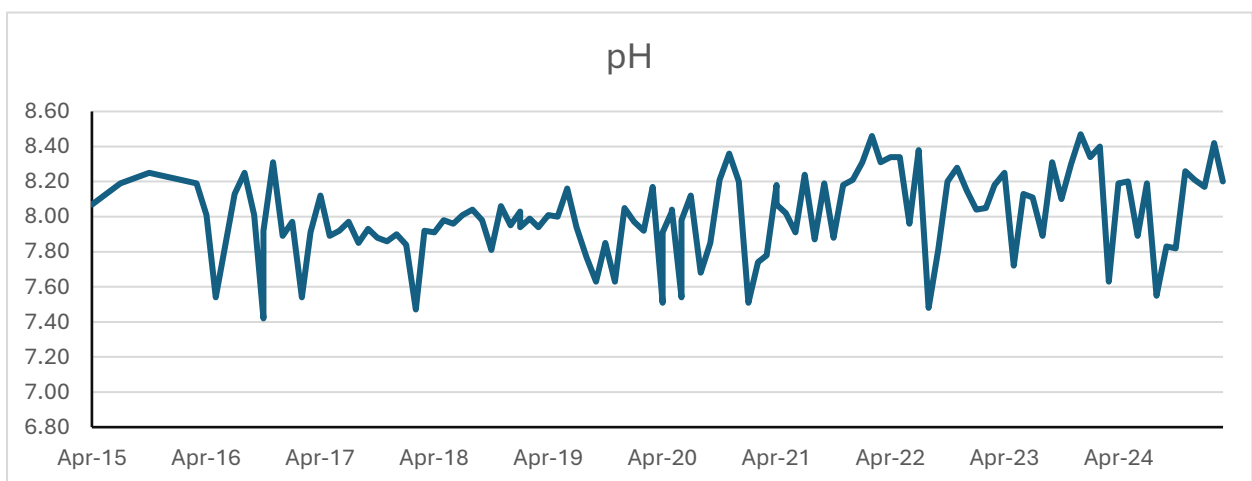
**Graph 63 Monthly variation of Nitrate at Zantor Station (2015-2025)**



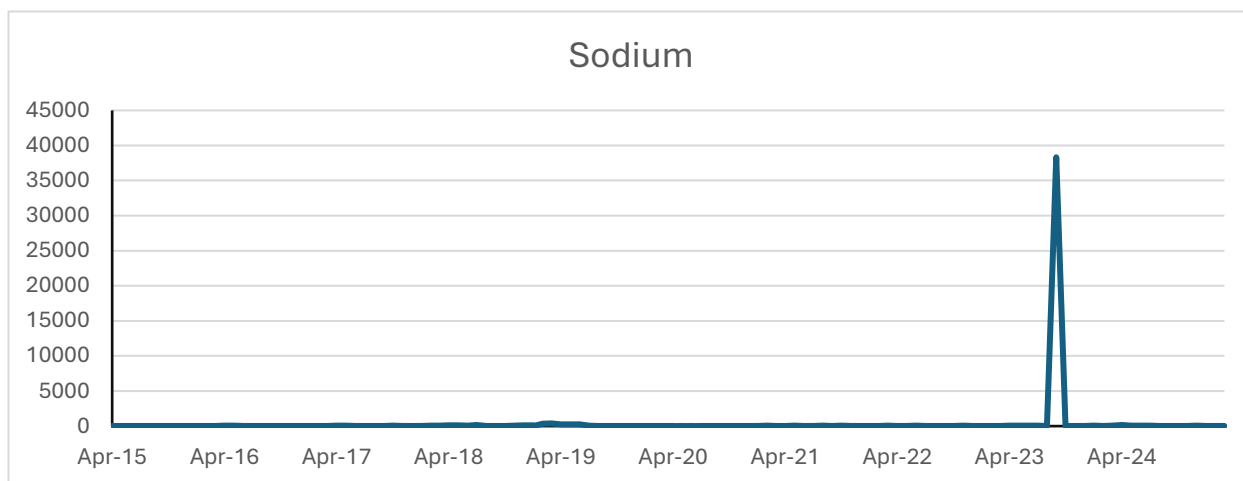
**Graph 64 Monthly variation of Phosphate at Zanor Station (2015-2025)**



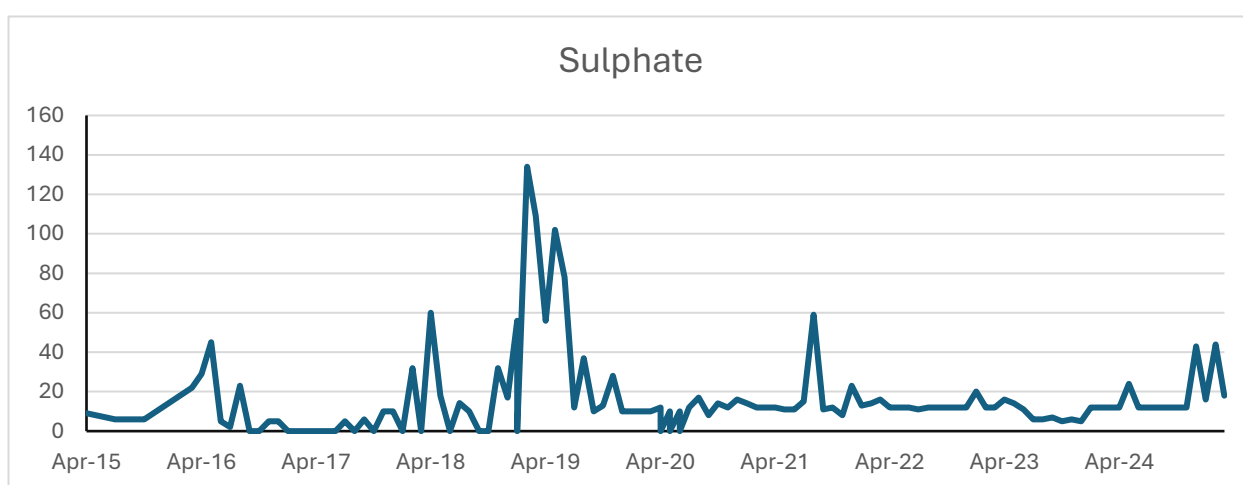
**Graph 65 Monthly variation of Potassium at Zanor Station (2015-2025)**



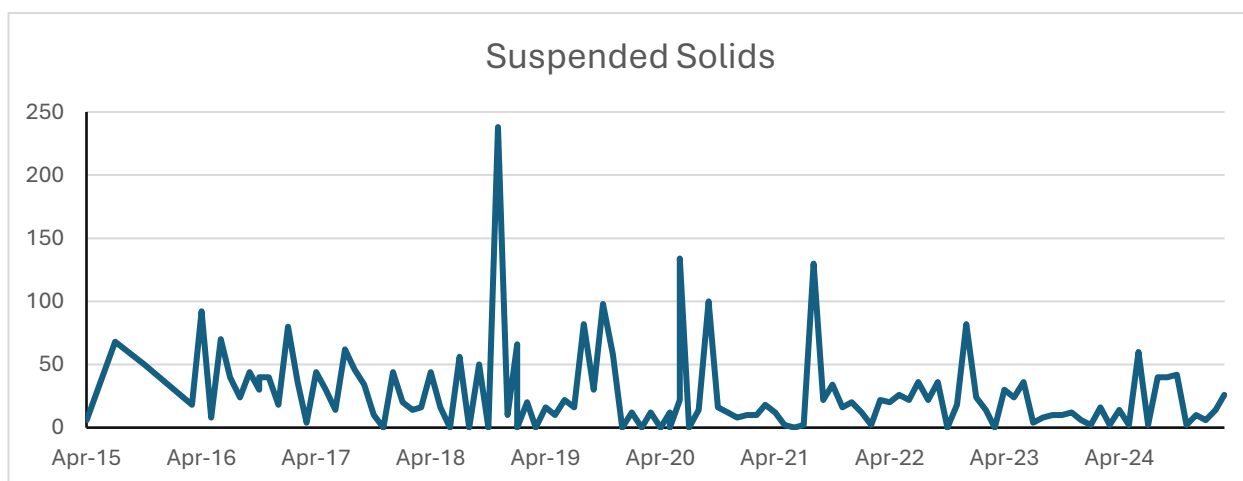
**Graph 66 Monthly variation of pH at Zanor Station (2015-2025)**



**Graph 67 Monthly variation of Sodium at Zanor Station (2015-2025)**

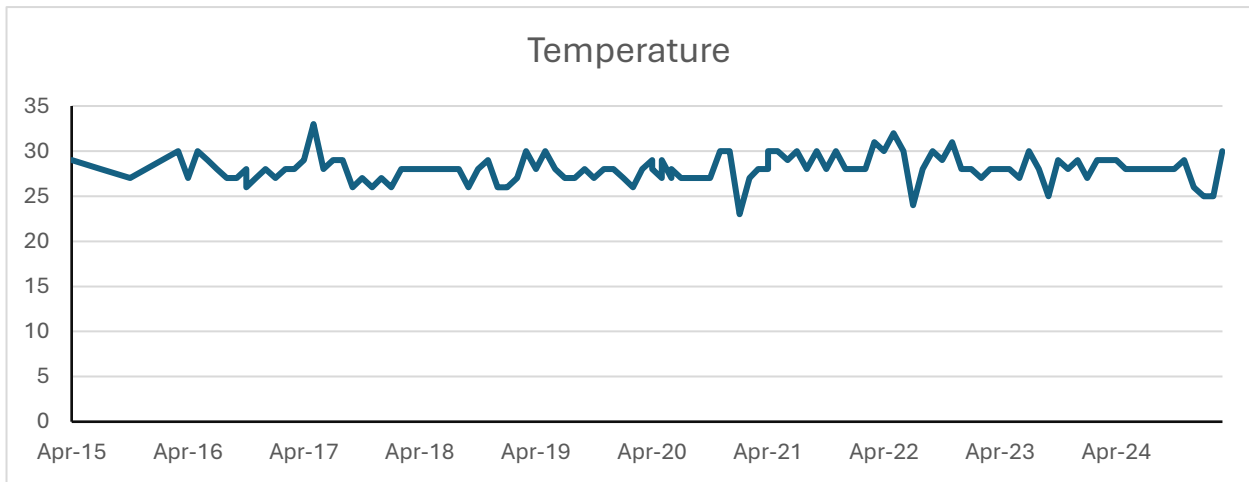


**Graph 68 Monthly variation of Sulphate at Zanor Station (2015-2025)**

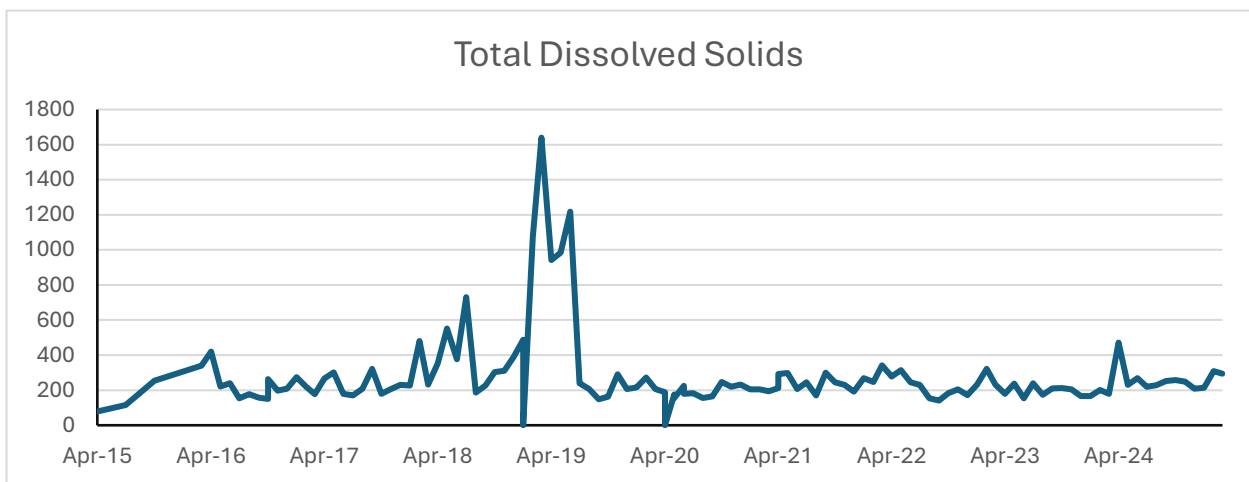


**Graph 69 Monthly variation of Suspended Solids at Zanor Station (2015-2025)**

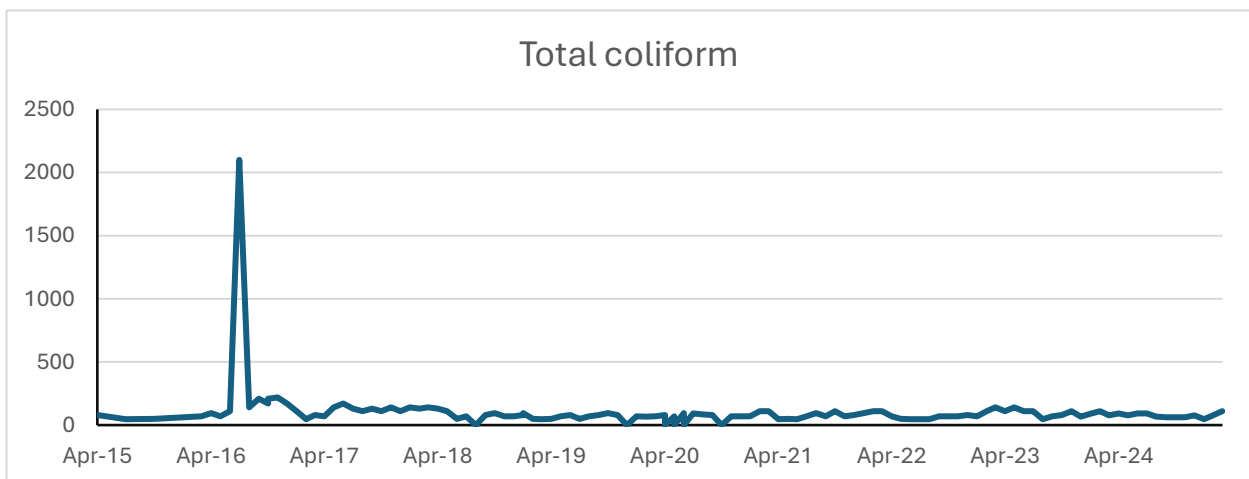




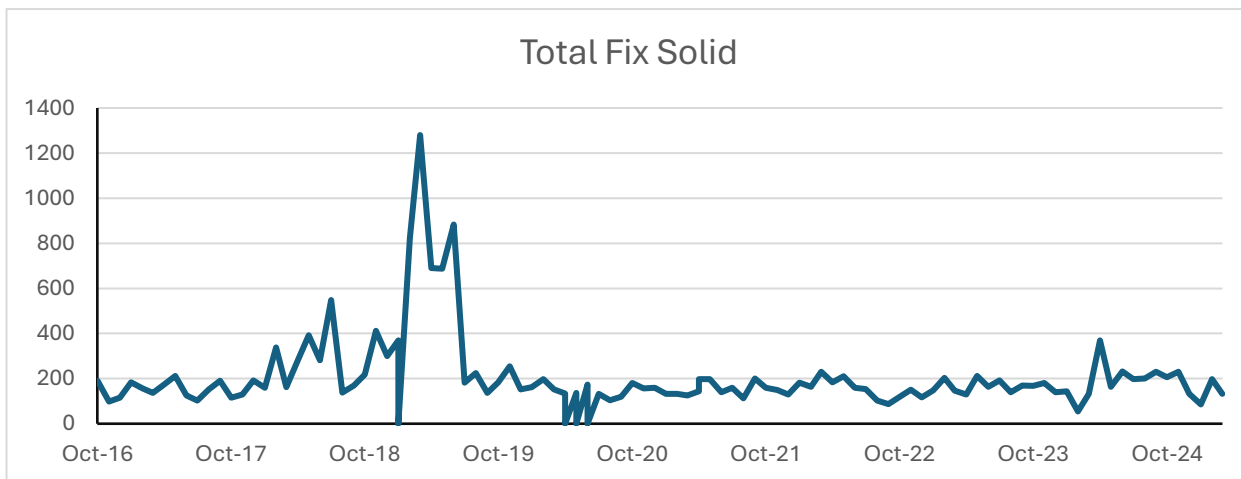
**Graph 70 Monthly variation of Temperature at Zantor Station (2015-2025)**



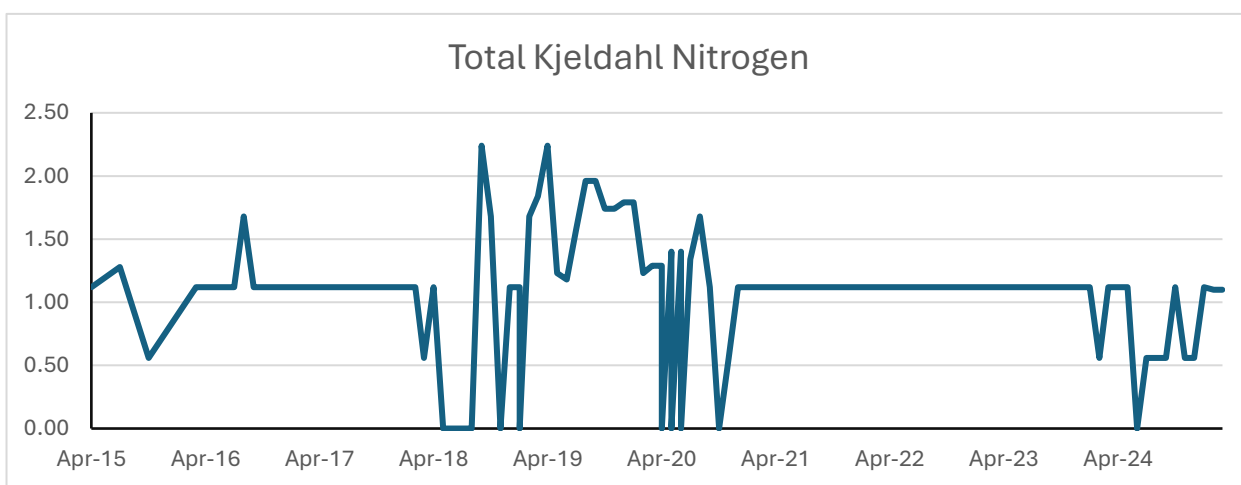
**Graph 71 Monthly variation of Total Dissolved Solids at Zantor Station (2015-2025)**



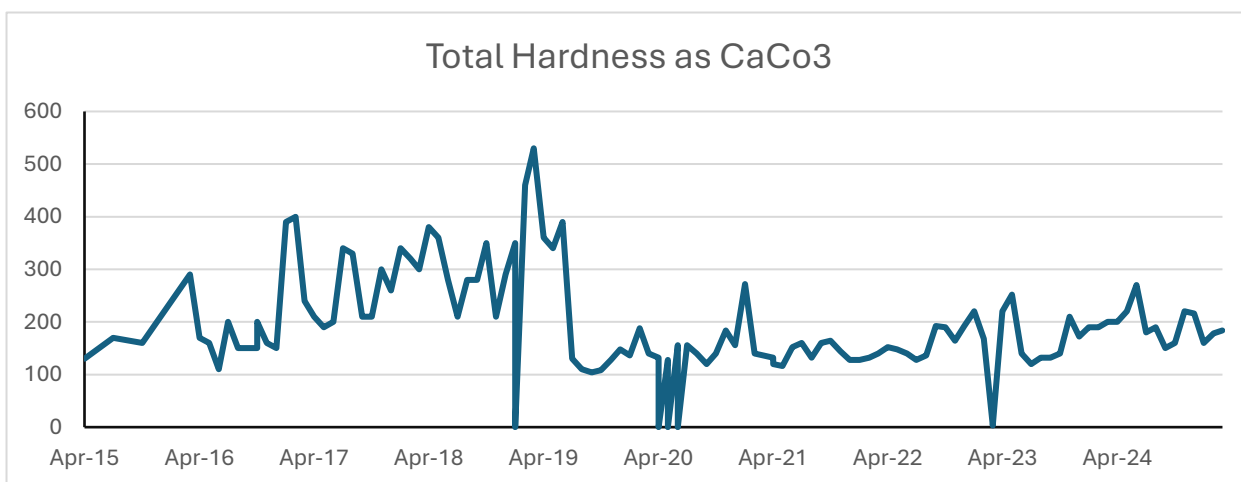
**Graph 72 Monthly variation of Total Coliform at Zantor Station (2015-2025)**



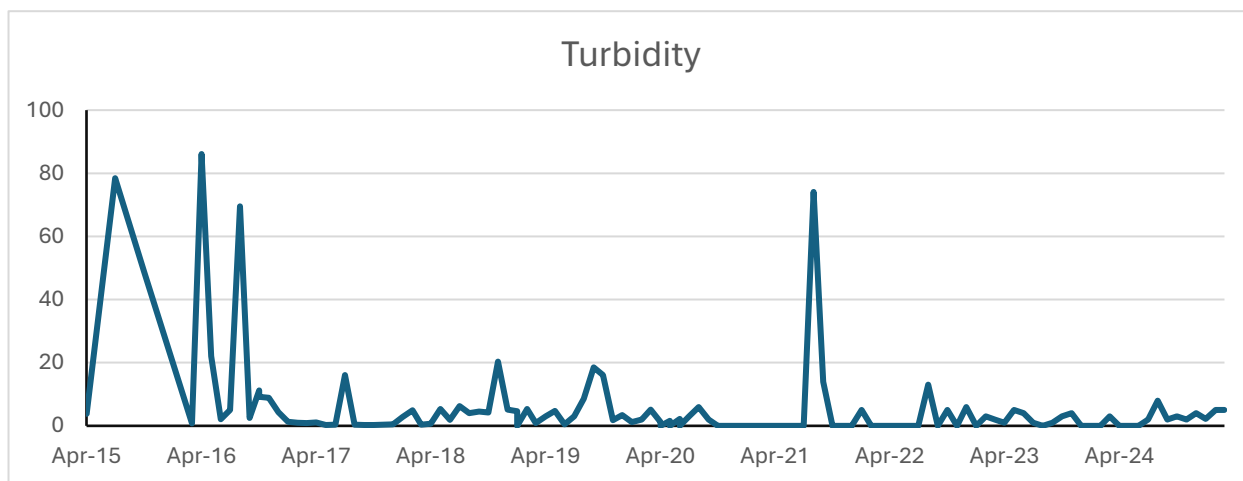
**Graph 73 Monthly variation of Total Fix Solid at Zanor Station (2015-2025)**



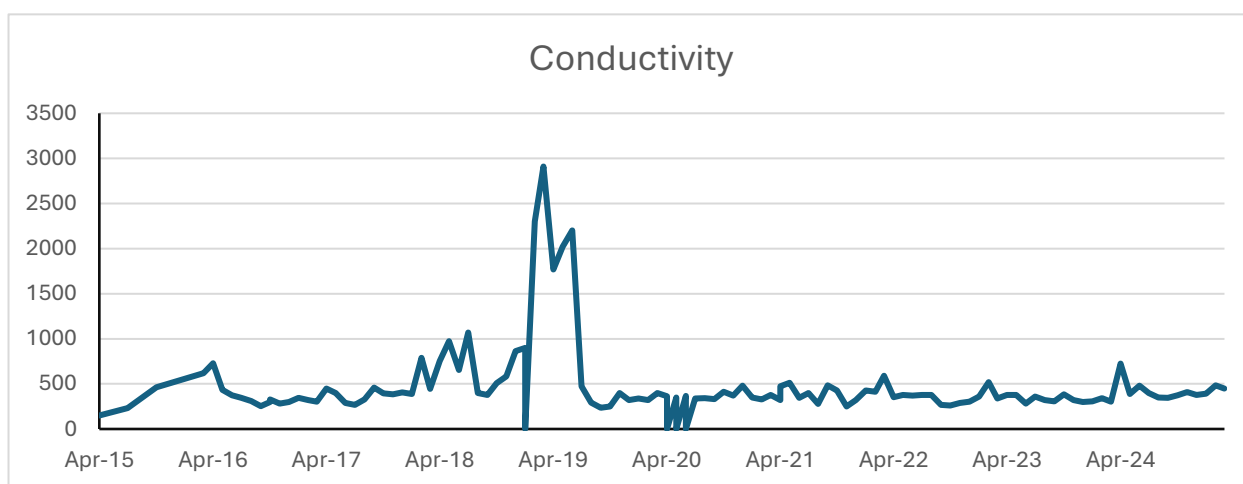
**Graph 74 Monthly variation of Total Kjeldahl Nitrogen at Zanor Station (2015-2025)**



**Graph 75 Monthly variation of Total Hardness as CaCo<sub>3</sub> at Zanor Station (2015-2025)**



**Graph 76 Monthly variation of Turbidity at Zanol Station (2015-2025)**



**Graph 77 Monthly variation of Conductivity at Zanol Station (2015-2025)**

Graph 51: The graph shows the monthly variation of *Alkalinity as CaCo<sub>3</sub>* at Zanol Station from April 2015 to April 2025. Alkalinity ranged from 100 to 180 mg/L, within typical ranges.

Graph 52: The graph shows the monthly variation of *B.O.D. (3 Days 27 °C)* at Zanol Station from April 2015 to April 2025. BOD ranged from 0.56 to 2.5 mg/L, CPCB bathing criterion:  $BOD \leq 3$  mg/L, within permissible ranges.

Graph 53: The graph shows the monthly variation of *Boron* at Zanol Station from April 2015 to April 2025. Boron ranged from 0.01 to 0.8 mg/L, within drinking-water guidance.

Graph 54: The graph shows the monthly variation of *Calcium* at Zanol Station from April 2015 to April 2025. Calcium ranged from 1.18 to 112 mg/L, some months above typical benchmarks.

Graph 55: The graph shows the monthly variation of *Chemical Oxygen Demand* at Zantor Station from April 2015 to April 2025. COD ranged from 6 to 30 mg/L, moderate; occasional increases reflect organic inputs.

Graph 56: The graph shows the monthly variation of *Chloride* at Zantor Station from April 2015 to April 2025. Chloride ranged from 20 to 780 mg/L, permissible limit (BIS IS10500): 250 mg/L, exceeds permissible limit in some areas.

Graph 57: The graph shows the monthly variation of *Dissolved Oxygen* at Zantor Station from April 2015 to April 2025. DO ranged from 5.8 to 8.8 mg/L, CPCB ecological guideline:  $DO \geq 6$  mg/L, mostly meets ecological criteria, supporting aquatic life.

Graph 58: The graph shows the monthly variation of *Fecal Coliform* at Zantor Station from April 2015 to April 2025. Fecal Coliform ranged from 15 to 80 MPN/100mL, permissible limit for drinking: 0 MPN/100mL, significant microbial contamination in parts of dataset, needs treatment before use.

Graph 59: The graph shows the monthly variation of *Fluoride* at Zantor Station from April 2015 to April 2025. Fluoride ranged from 0.06 to 1.35 mg/L, permissible limit (BIS IS10500): 1.5 mg/L, within permissible limit.

Graph 60: The graph shows the monthly variation of *Fixed Dissolved Solids* at Zantor Station from April 2015 to April 2025. Fixed Dissolved Solids ranged from 58 to 270 (reported with TDS), within typical ranges.

Graph 61: The graph shows the monthly variation of *Magnesium* at Zantor Station from April 2015 to April 2025. Magnesium ranged from 1.44 to 68.0 mg/L, exceeds permissible limit in some areas.

Graph 62: The graph shows the monthly variation of *Nitrite* at Zantor Station from April 2015 to April 2025. Nitrite ranged from 0.01 to 0.06 mg/L, permissible limit (BIS IS10500): 0.2 mg/L, within permissible limit.

Graph 63: The graph shows the monthly variation of *Nitrate* at Zantor Station from April 2015 to April 2025. Nitrate ranged from 0.01 to 1.93 mg/L, permissible limit (BIS IS10500): 45 mg/L, within permissible limit.

Graph 64: The graph shows the monthly variation of *Phosphate* at Zantor Station from April 2015 to April 2025. Phosphate ranged from 0 to 1.16 mg/L, low to moderate: occasional monsoon peaks.

Graph 65: The graph shows the monthly variation of *Potassium* at Zantor Station from April 2015 to April 2025. Potassium ranged from 0.1 to 38 mg/L, within normal environmental concentrations.

Graph 66: The graph shows the monthly variation of *pH* at Zantor Station from April 2015 to April 2025. pH ranged from 7.42 to 8.5, permissible limit (BIS IS10500): 6.5–8.5, within permissible limits.

Graph 67: The graph shows the monthly variation of *Sodium* at Zantor Station from April 2015 to April 2025. Sodium ranged from 2.0 to 390.0 mg/L, within typical guideline ranges.

Graph 68: The graph shows the monthly variation of *Sulphate* at Zantor Station from April 2015 to April 2025. Sulphate ranged from 2.0 to 140.0 mg/L, permissible limit (BIS IS10500): 200 mg/L, within permissible limit.

Graph 69: The graph shows the monthly variation of *Suspended Solids* at Zantor Station from April 2015 to April 2025. Suspended Solids ranged from 2.0 to 238.0 mg/L, seasonal variability, some monsoon increases.

Graph 70: The graph shows the monthly variation of *Temperature* at Zantor Station from April 2015 to April 2025. Temperature ranged from 23.0 to 33.0 °C, seasonal variation.

Graph 71: The graph shows the monthly variation of *Total Dissolved Solids* at Zantor Station from April 2015 to April 2025. TDS ranged from 78 to 1680 mg/L, permissible limit (BIS IS10500): 2000 mg/L, within permissible limit but some months above desirable 500 mg/L.

Graph 72: The graph shows the monthly variation of *Total Coliform* at Zantor Station from April 2015 to April 2025. Total Coliform ranged from 50 to 10,000 MPN/100mL, permissible limit for drinking: 0 MPN/100mL, CPCB criteria for bathing differ, indicates substantial microbial contamination in parts of the dataset.

Graph 73: The graph shows the monthly variation of *Total Fix Solid* at Zantor Station from April 2015 to April 2025. Total Fixed Solid (reported with TDS) ranged from 54 to 1280 (see TDS), within typical ranges.

Graph 74: The graph shows the monthly variation of *Total Kjeldahl Nitrogen* at Zantor Station from April 2015 to April 2025. TKN ranged from 0.6 to 2.3 mg/L, within expected environmental ranges.

Graph 75: The graph shows the monthly variation of *Total Hardness as CaCo<sub>3</sub>* at Zantor Station from April 2015 to April 2025. Total Hardness ranged from 3.3 to 530 mg/L, permissible limit (BIS IS10500): 600 mg/L, within permissible limit.

Graph 76: The graph shows the monthly variation of *Turbidity* at Zantor Station from April 2015 to April 2025. Turbidity ranged from 0.3 to 86, permissible limit (BIS IS10500): 5 NTU, episodic spikes (monsoon/loads) exceed permissible limits and require attention.

Graph 77: The graph shows the monthly variation of *Conductivity* at Zantor Station from April 2015 to April 2025. Conductivity ranged from 60 to 1500  $\mu$ S/cm, shows ionic variability; some high values reflect elevated dissolved salts in parts of the record.

Zantor's water station parameters show many chemical parameters generally within BIS ecological/permissible ranges (TDS mostly  $\leq$ 1680 mg/L and below the 2000 mg/L drinking threshold, fluoride within limits, hardness usually acceptable), but show alarmingly large microbial contamination (total coliforms 50–10,000 MPN/100 mL; fecal coliforms 15–80 MPN/100 mL) and turbidity spikes to ~86 NTU (BIS desirable  $\leq$ 1, permissible 5 NTU), plus occasional high chloride (to ~780 mg/L, above the 250 mg/L desirable/limit) and very high conductivity/TDS episodes (conductivity to 1500  $\mu$ S/cm, TDS up to 1680 mg/L) and elevated COD (to 30 mg/L) that point to organic and saline/ionic inputs.

#### 2.2.4. Station: Zadeshwar

Zadeshwar lies closer to the estuarine zone and is more influenced by human activity, effluent discharge, and tidal mixing. **Graph 78 to Graph 104** show the water quality parameters with time from 2015 to 2025 of Zadeshwar Station.

**Organic Pollution:** BOD levels are moderate, and COD shows elevated values compared to upstream stations, indicating higher organic and chemical loading from urban and industrial sources.

**Dissolved Oxygen:** DO is adequate ( $>5$  mg/L) but slightly lower compared to upstream stations, reflecting the combined effect of organic load and reduced re-aeration.

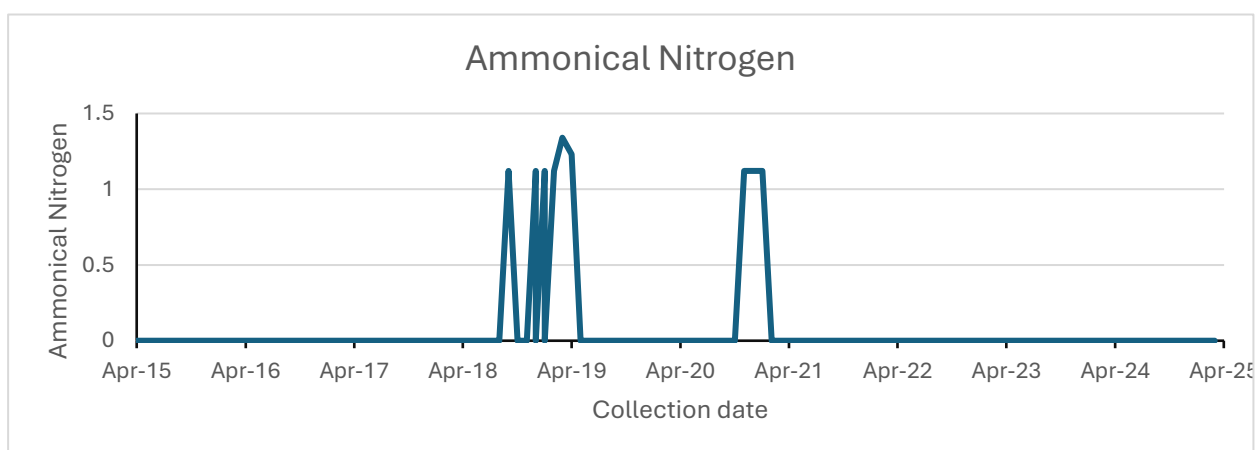
**Nutrients:** Nitrate and phosphate are moderate to high, reflecting agricultural runoff and untreated sewage inflows. Seasonal spikes during monsoon are notable.

**Microbial Load:** Coliform counts are high, particularly during monsoon, pointing to substantial sewage and stormwater inflows. This raises concerns for public health and water usability.

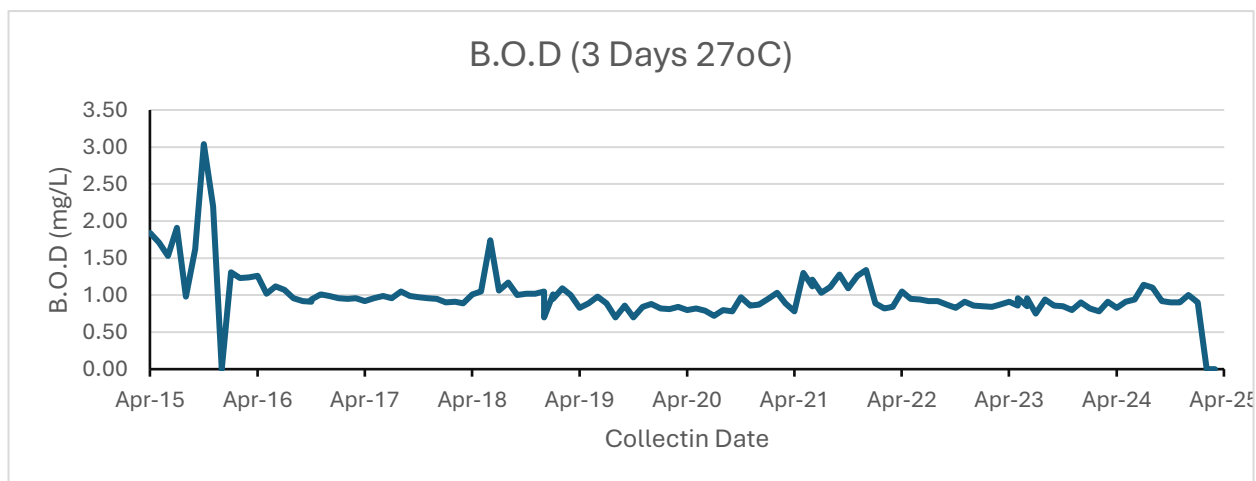
**Metals:** Iron and manganese occasionally exceed safe limits during monsoon and high tide conditions, likely from industrial discharge and sediment disturbance. Other heavy metals remain within safe ranges.

**Salinity & Hardness:** Higher chloride and TDS levels are recorded compared to upstream stations, influenced by tidal mixing and estuarine effects.

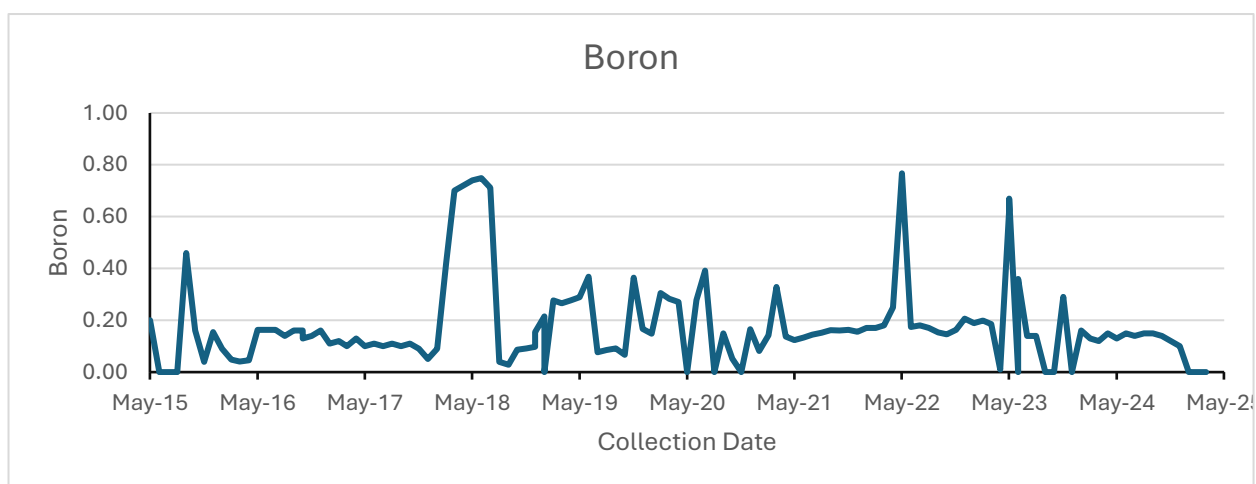
**Overall Condition:** Zadeshwar shows moderate water quality with higher anthropogenic stress. Microbial contamination and nutrient enrichment are key concerns requiring targeted interventions.



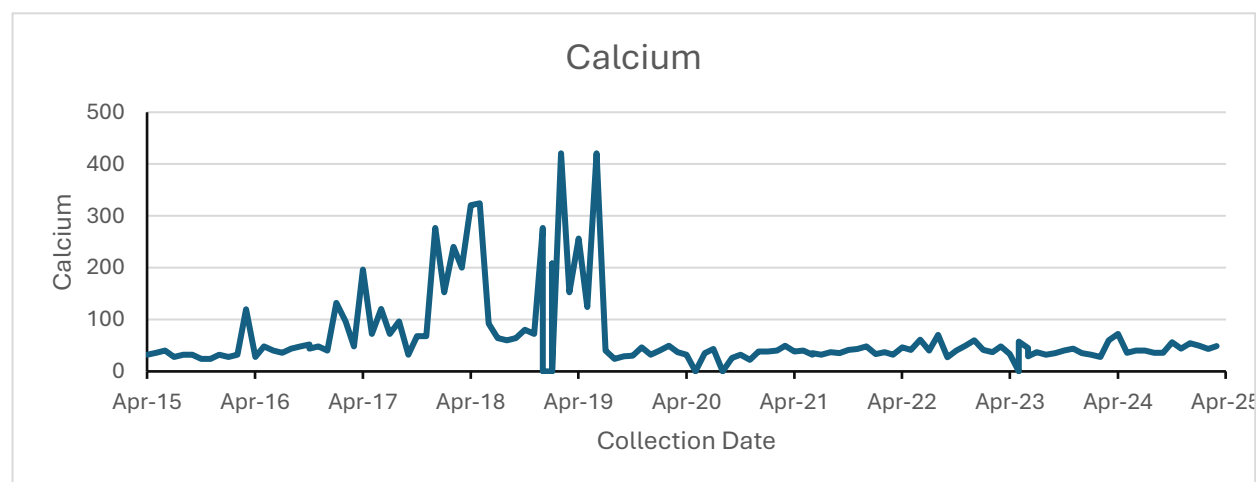
*Graph 78 Monthly variation of Ammonical Nitrogen at Zadeshwar Station (2015-2025)*



**Graph 79 Monthly variation of B.O.D. (3 days 27 °C at Zadeshwar Station (2015-2025))**

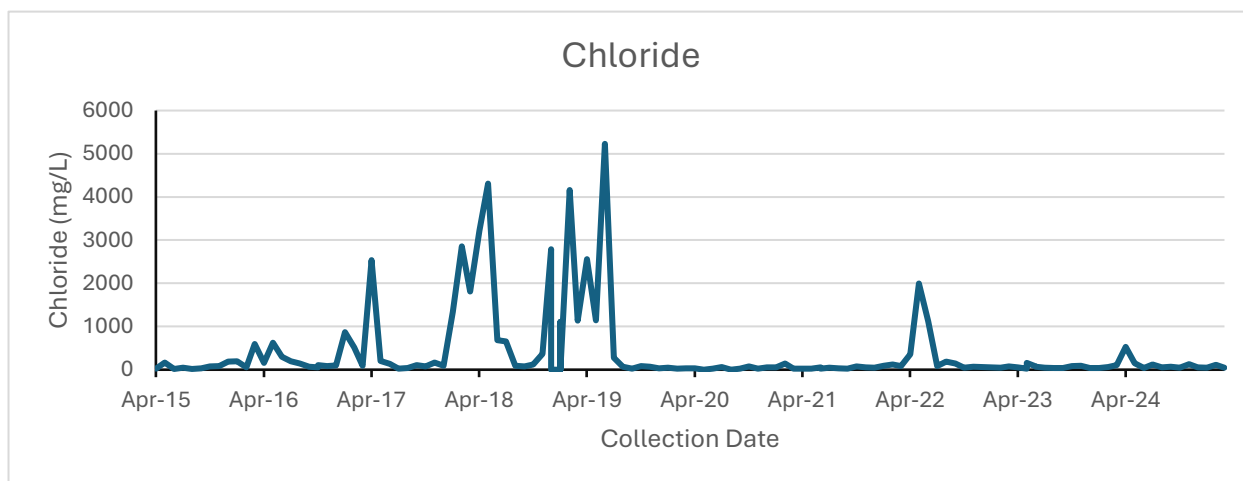


**Graph 80 Monthly variation of Boron at Zadeshwar Station (2015-2025)**

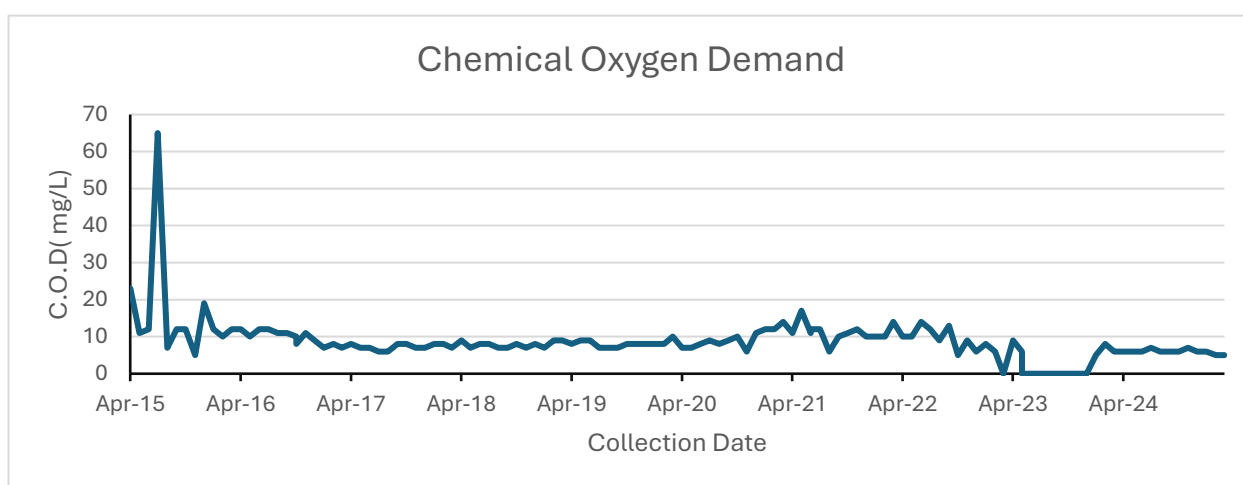


**Graph 81 Monthly variation of Calcium at Zadeshwar Station (2015-2025)**

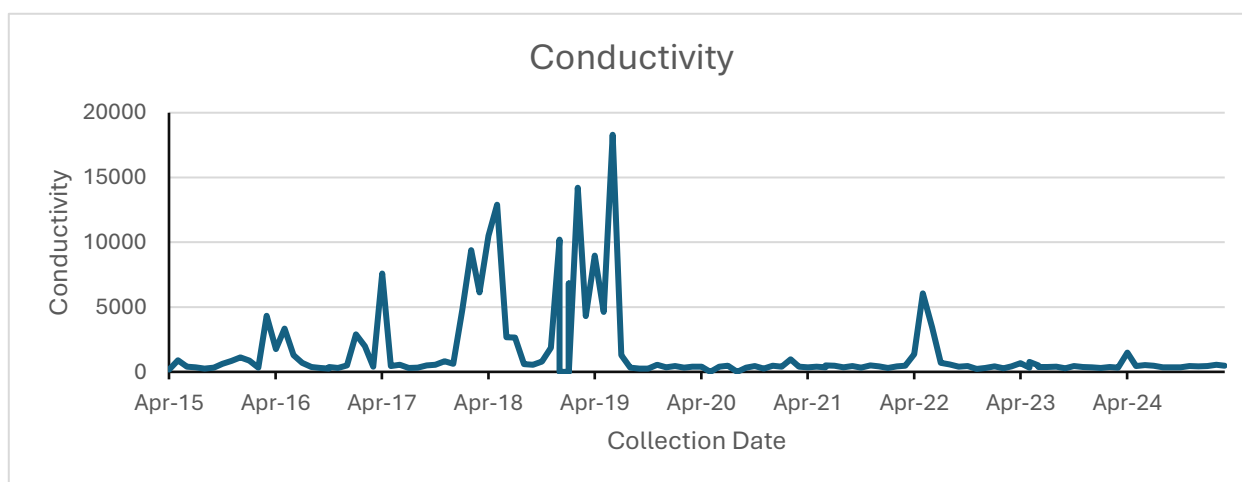




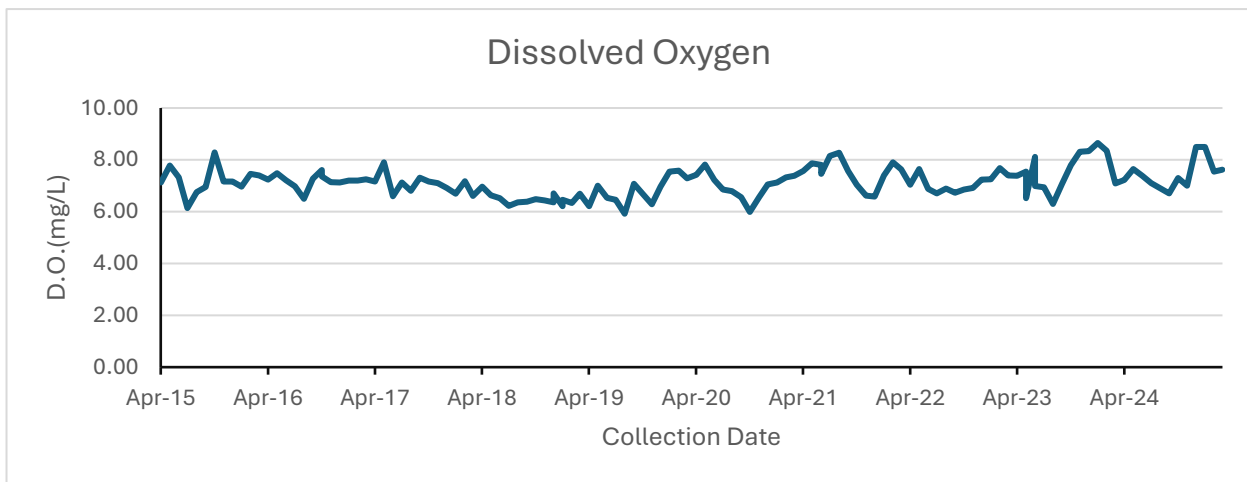
**Graph 82 Monthly variation of Chloride at Zadeshwar Station (2015-2025)**



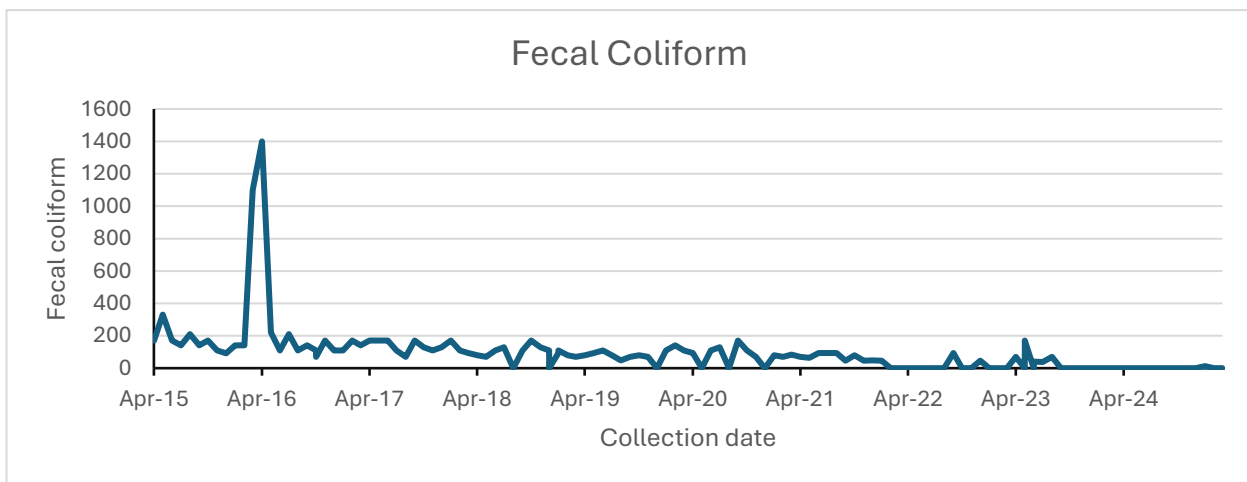
**Graph 83 Monthly variation of Chemical Oxygen Demand at Zadeshwar Station (2015-2025)**



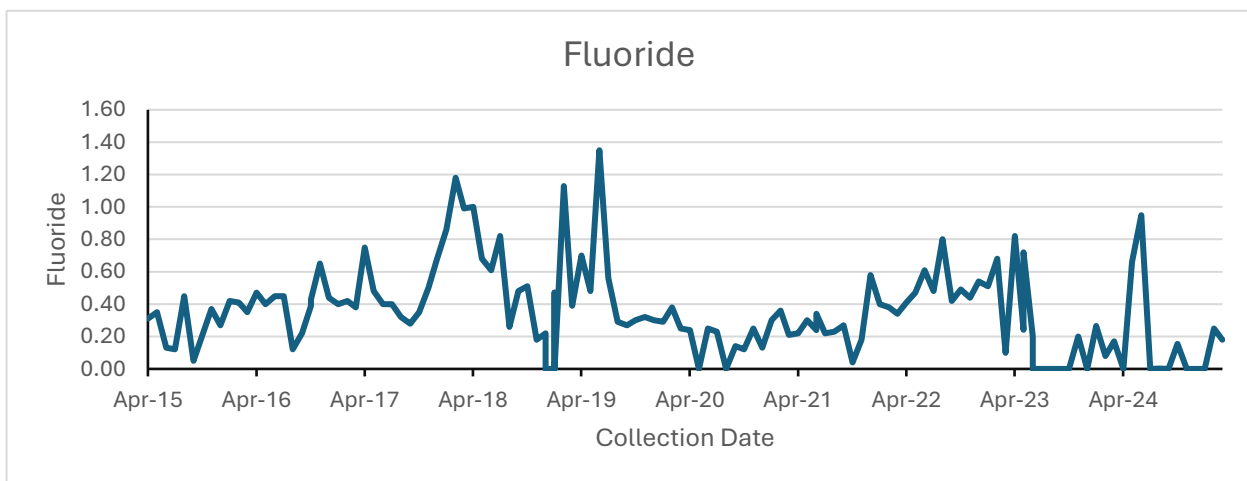
**Graph 84 Monthly variation of Conductivity at Zadeshwar Station (2015-2025)**



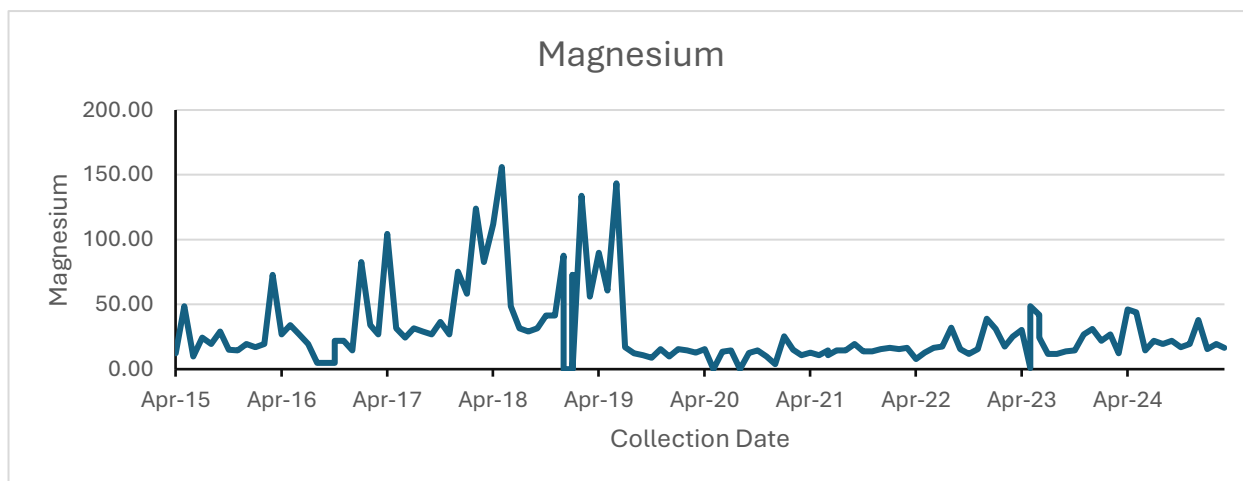
***Graph 85 Monthly variation of Dissolved Oxygen at Zadeshwar Station (2015-2025)***



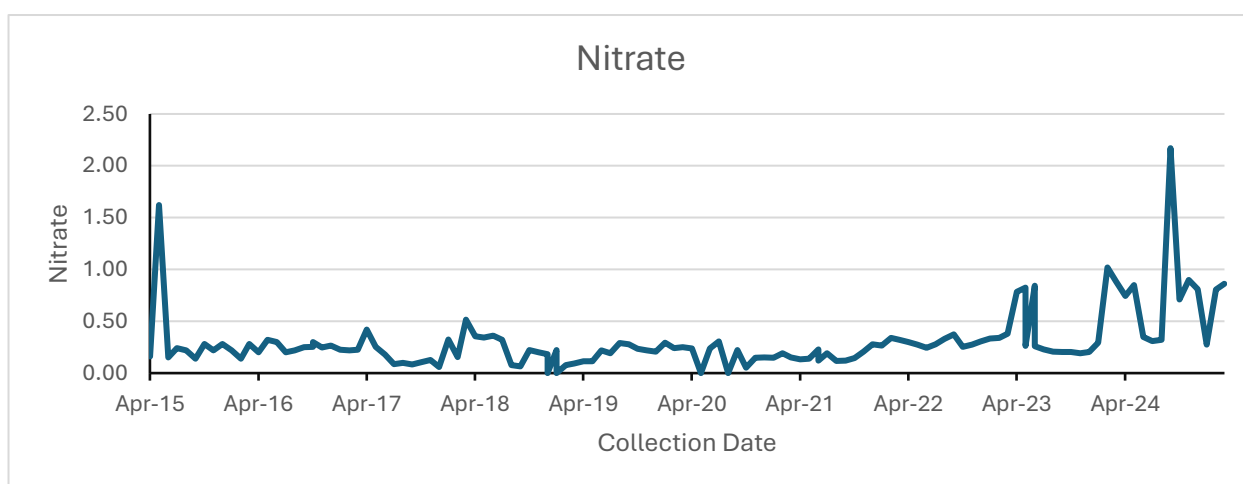
***Graph 86 Monthly variation of Fecal Coliform at Zadeshwar Station (2015-2025)***



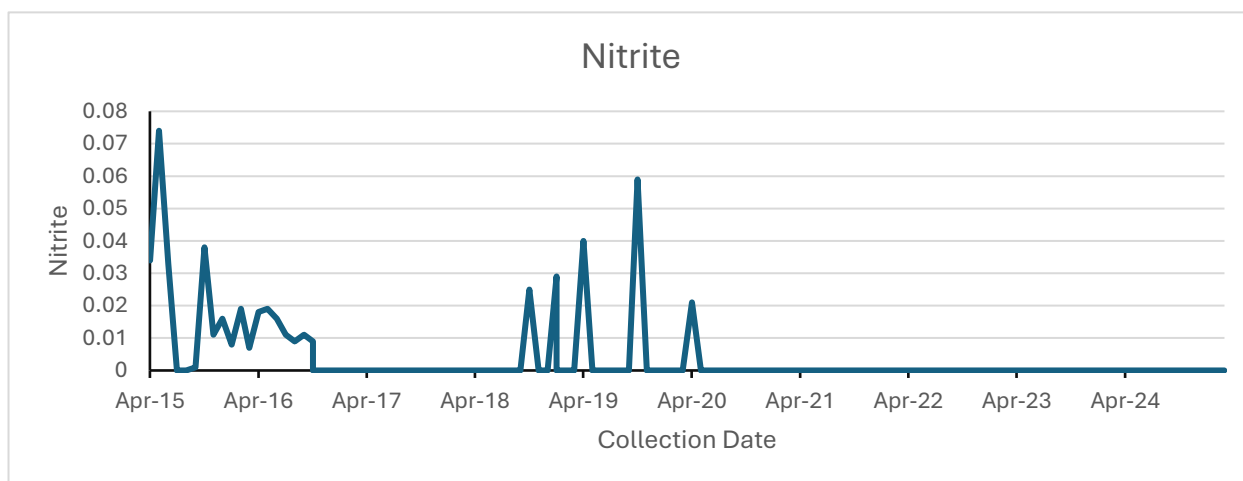
***Graph 87 Monthly variation of Fluoride at Zadeshwar Station (2015-2025)***



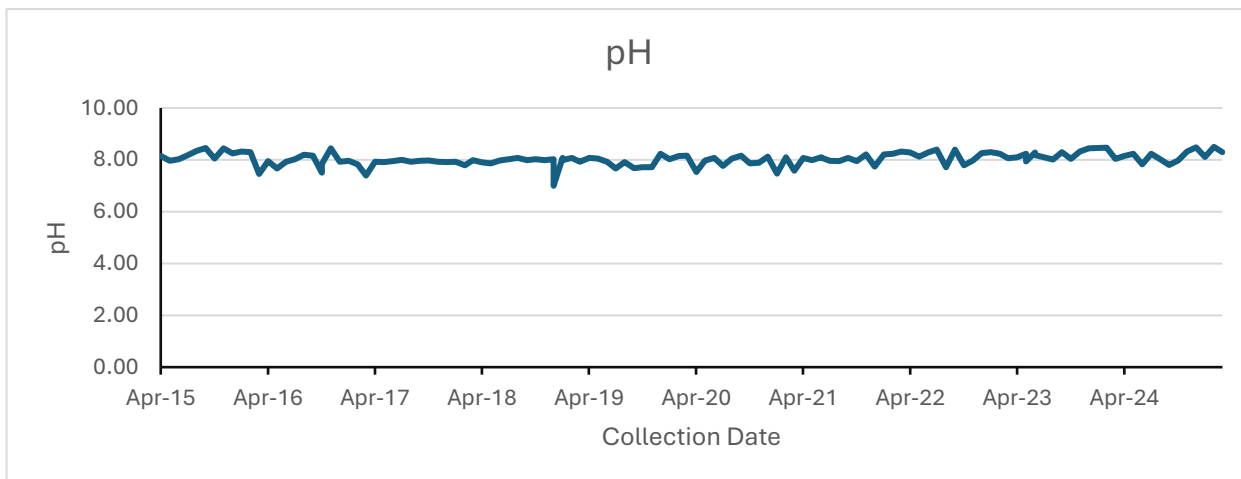
**Graph 88 Monthly variation of Magnesium at Zadeshwar Station (2015-2025)**



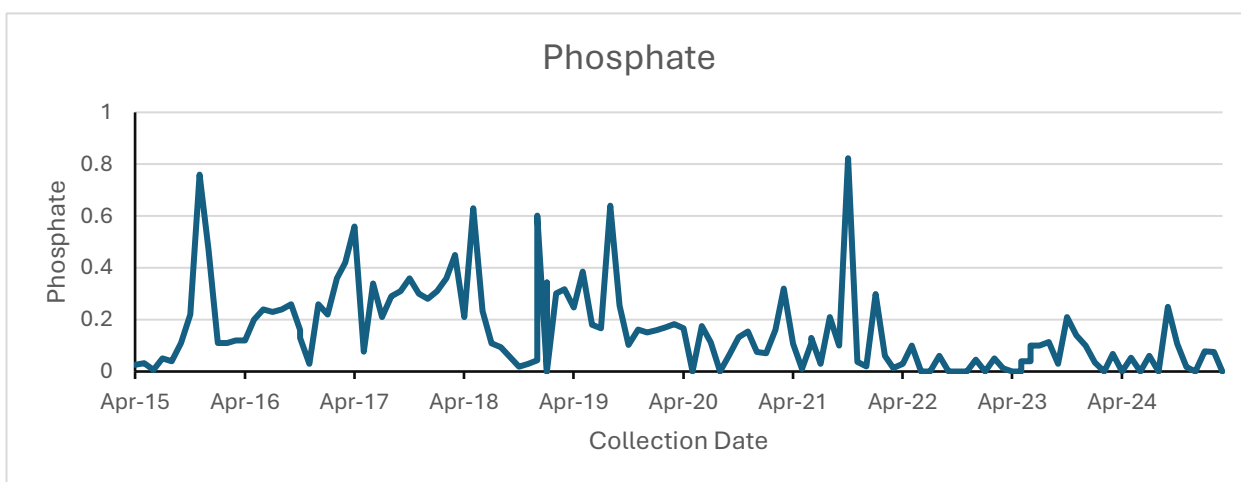
**Graph 89 Monthly variation of Nitrate at Zadeshwar Station (2015-2025)**



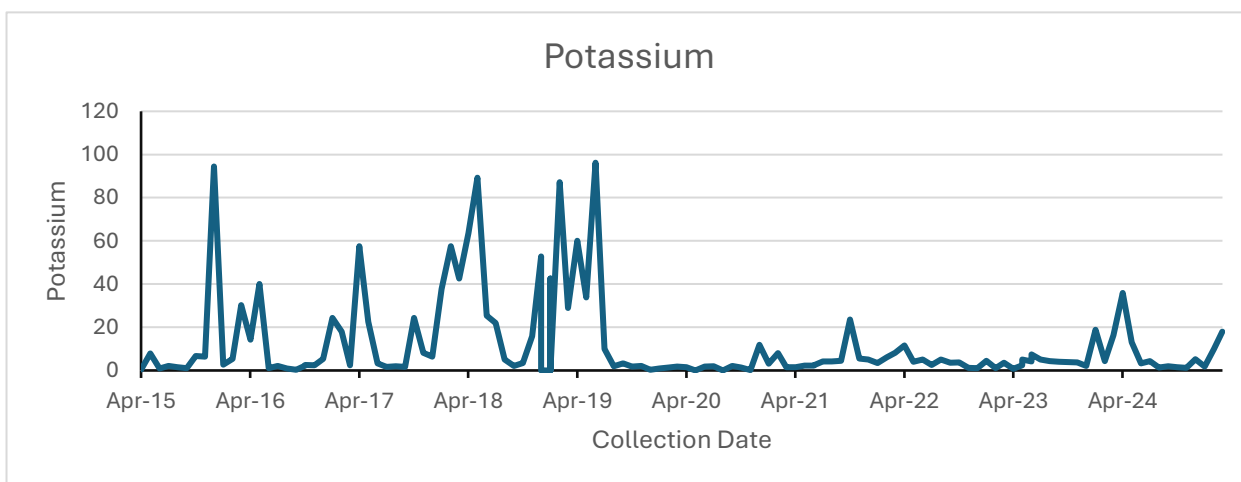
**Graph 90 Monthly variation of Nitrite at Zadeshwar Station (2015-2025)**



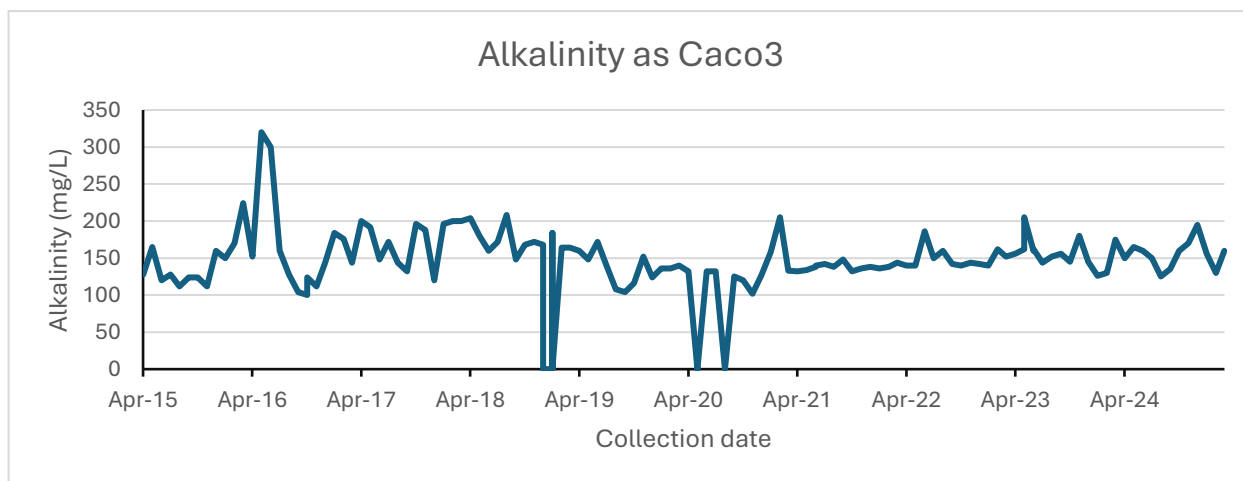
***Graph 91 Monthly variation of pH at Zadeshwar Station (2015-2025)***



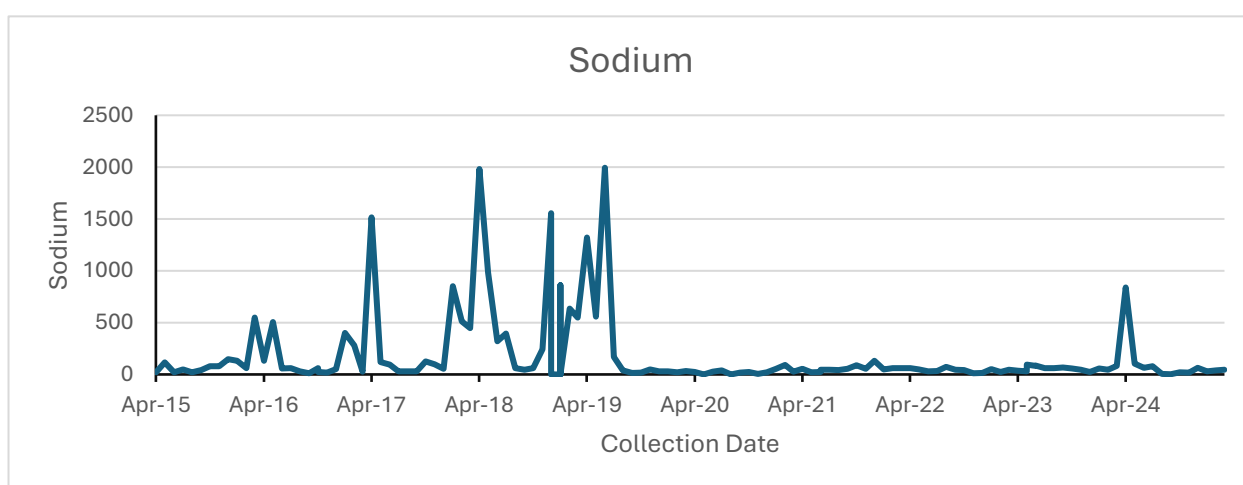
***Graph 92 Monthly variation of Phosphate at Zadeshwar Station (2015-2025)***



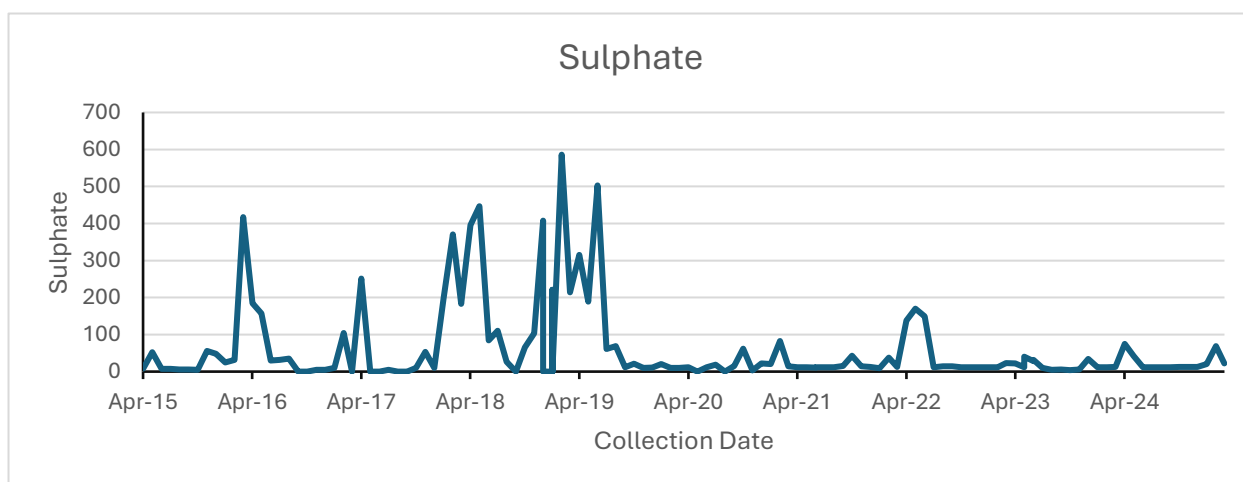
***Graph 93 Monthly variation of Potassium at Zadeshwar Station (2015-2025)***



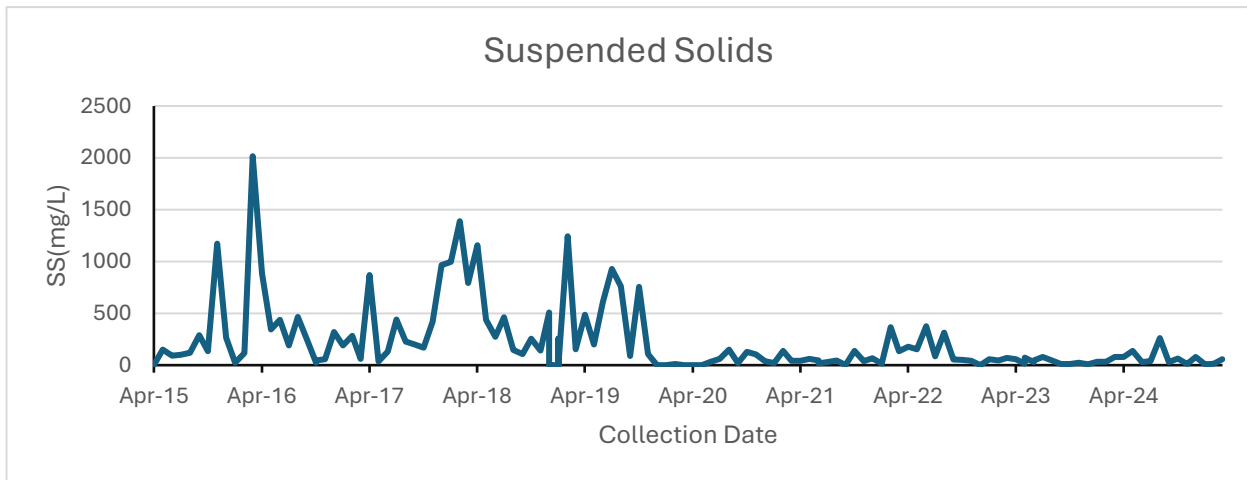
**Graph 94 Monthly variation of Alkalinity as  $\text{CaCO}_3$  at Zadeshwar Station (2015-2025)**



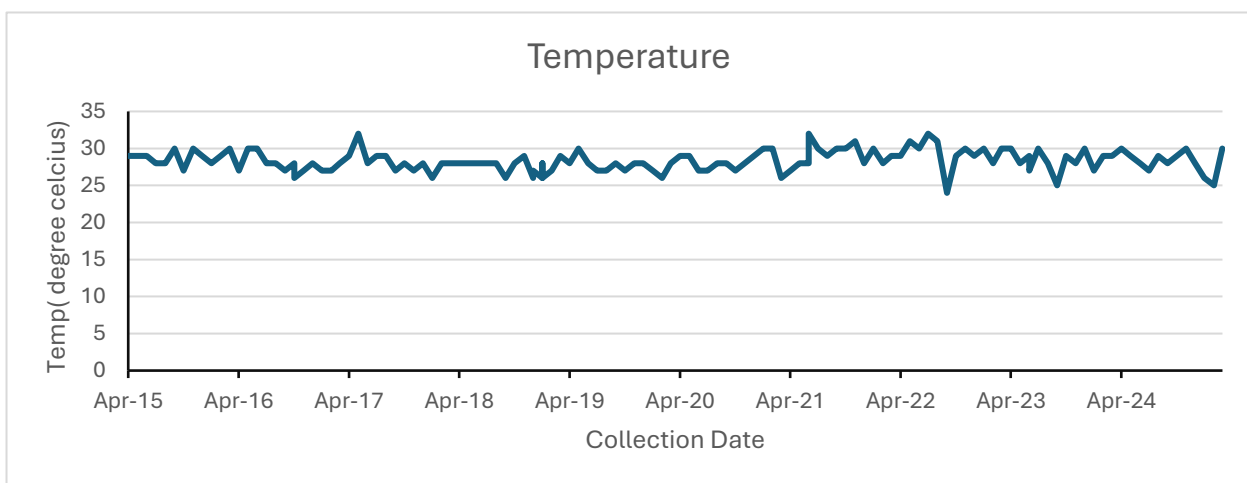
**Graph 95 Monthly variation of Sodium at Zadeshwar Station (2015-2025)**



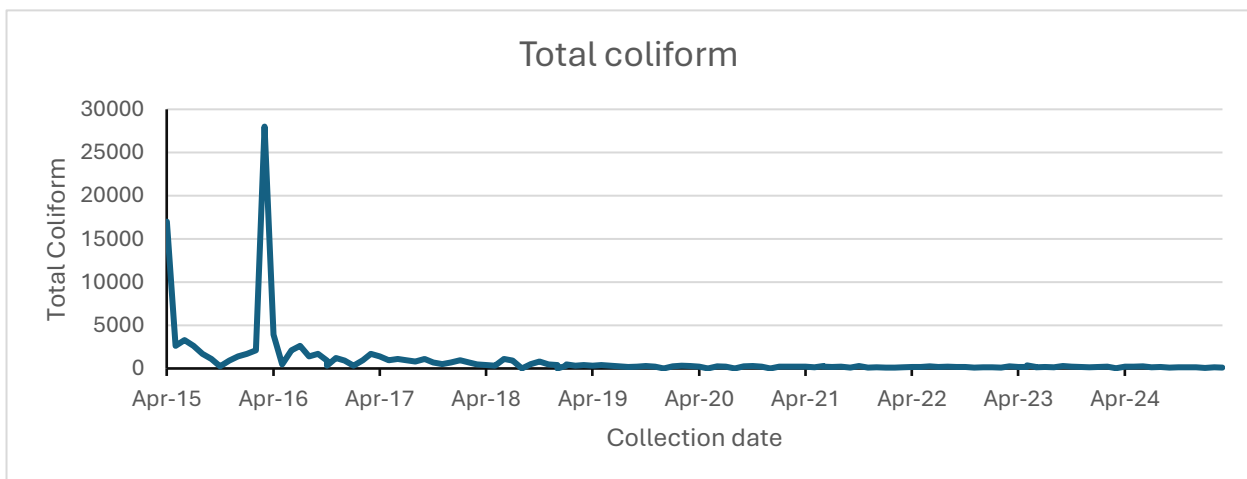
**Graph 96 Monthly variation of Sulphate at Zadeshwar Station (2015-2025)**



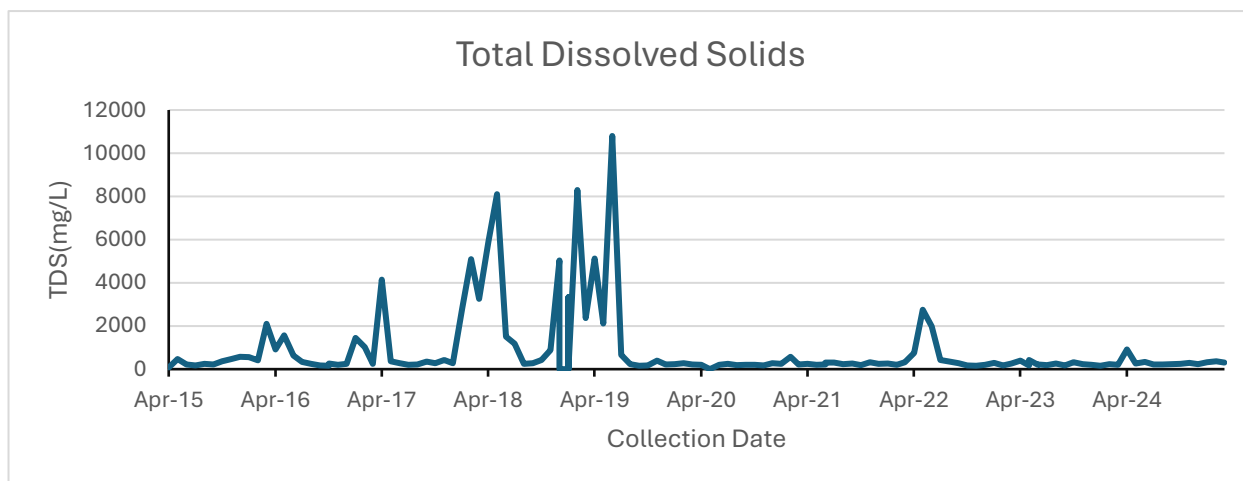
***Graph 97 Monthly variation of Suspended Solids at Zadeshwar Station (2015-2025)***



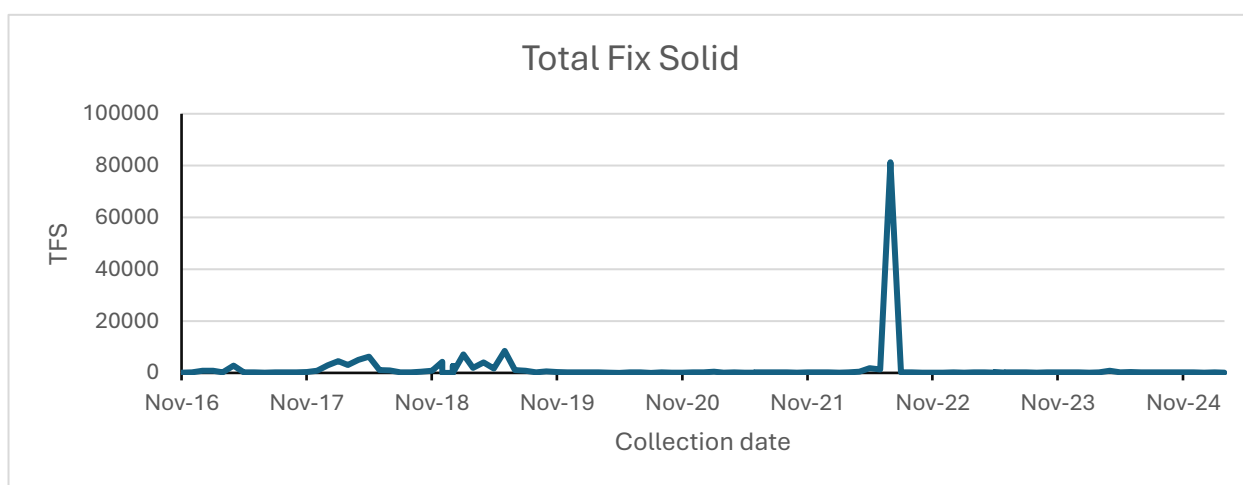
***Graph 98 Monthly variation of Temperature at Zadeshwar Station (2015-2025)***



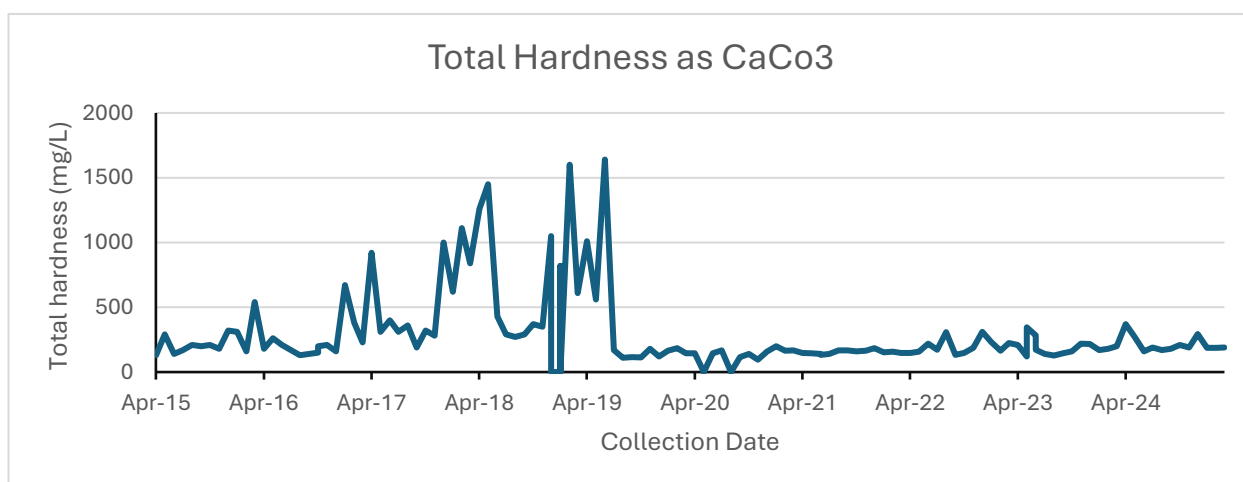
***Graph 99 Monthly variation of Total Coliform at Zadeshwar Station (2015-2025)***



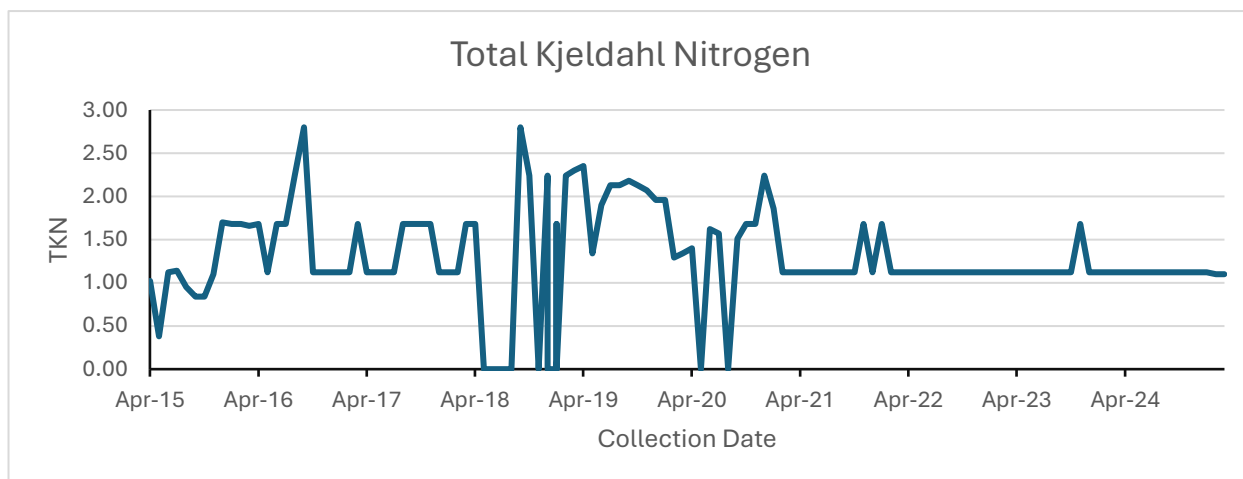
**Graph 100 Monthly variation of Total Dissolved Solids at Zadeshwar Station (2015-2025)**



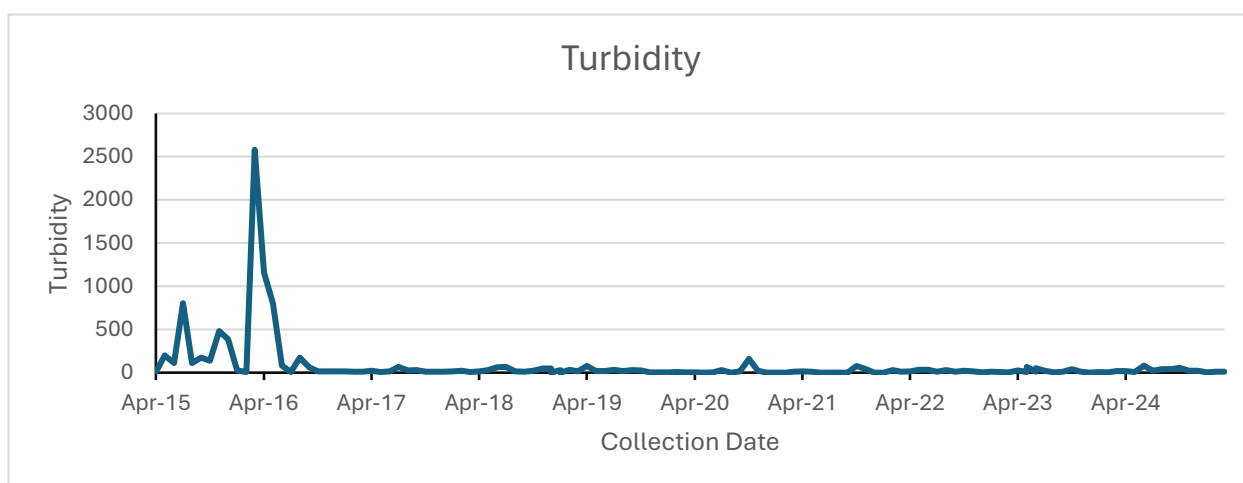
**Graph 101 Monthly variation of Total Fix Solid at Zadeshwar Station (2015-2025)**



**Graph 102 Monthly variation of Total Hardness at Zadeshwar Station (2015-2025)**



**Graph 103 Monthly variation of Total Kjeldahl Nitrogen at Zadeshwar Station (2015-2025)**



**Graph 104 Monthly variation of Turbidity at Zadeshwar Station (2015-2025)**

Graph 78: The graph shows the monthly variation of *Ammonical Nitrogen* at Zadeshwar Station from April 2015 to April 2025. Ammonical Nitrogen ranged from 1.12 to 1.34 mg/L, periodic elevations suggest organic inputs/effluent influence; no specific BIS drinking limit for ammonical Nitrogen but environmental concern when elevated.

Graph 79: The graph shows the monthly variation of *B.O.D. (3 days 27 °C)* at Zadeshwar Station from April 2015 to April 2025. BOD ranged from 0.7 to 3.0 mg/L, CPCB bathing criterion:  $BOD \leq 3$  mg/L, within permissible ranges.

Graph 80: The graph shows the monthly variation of *Boron* at Zadeshwar Station from April 2015 to April 2025. Boron ranged from 0.01 to 0.8 mg/L, typical BIS guidance: desirable ~0.5 mg/L; permissible often ~2.0 mg/L, within permissible ranges.



Graph 81: The graph shows the monthly variation of *Calcium* at Zadeshwar Station from April 2015 to April 2025. Calcium ranged from 22 to 420 mg/L, typical BIS guidance: desirable ~75 mg/L major concern for direct use.

Graph 82: The graph shows the monthly variation of *Chloride* at Zadeshwar Station from April 2015 to April 2025. Chloride ranged from 20 to 520 mg/L, permissible limit (BIS IS10500): 250 mg/L, exceeds permissible limit in some months; estuarine/tidal influence likely contributes.

Graph 83: The graph shows the monthly variation of *Chemical Oxygen Demand* at Zadeshwar Station from April 2015 to April 2025. COD ranged from 5 to 65 mg/L, elevated values in some months indicate chemical/organic loading.

Graph 84: The graph shows the monthly variation of *Conductivity* at Zadeshwar Station from April 2015 to April 2025. Conductivity ranged from 170 to 1830  $\mu\text{S}/\text{cm}$ , within permissible ranges. (tidal/reservoir influence).

Graph 85: The graph shows the monthly variation of *Dissolved Oxygen* at Zadeshwar Station from April 2015 to April 2025. DO ranged from 5.8 to 8.7 mg/L, CPCB ecological guideline:  $\text{DO} \geq 6$  mg/L for good water, some months fall below ecological threshold, indicating stress.

Graph 86: The graph shows the monthly variation of *Fecal Coliform* at Zadeshwar Station from April 2015 to April 2025. Fecal Coliform ranged from 13 to 1400, permissible limit for drinking: 0 MPN/100mL, very high microbial contamination, major health concern for direct use.

Graph 87: The graph shows the monthly variation of *Fluoride* at Zadeshwar Station from April 2015 to April 2025. Fluoride ranged from 0.0 to 1.4 mg/L, permissible limit (BIS IS10500): 1.5 mg/L, - within permissible ranges.

Graph 88: The graph shows the monthly variation of *Magnesium* at Zadeshwar Station from April 2015 to April 2025. Magnesium ranged from 0.96 to 156.0 mg/L, contributes to hardness: concerns over some elevated months.

Graph 89: The graph shows the monthly variation of *Nitrate* at Zadeshwar Station from April 2015 to April 2025. Nitrate ranged from 0.0 to 2.0 mg/L, permissible limit (BIS IS10500): 45 mg/L, within permissible ranges.

Graph 90: The graph shows the monthly variation of *Nitrite* at Zadeshwar Station from April 2015 to April 2025. Nitrite ranged from 0.01 to 0.07mg/L, permissible limit (BIS IS10500): 0.2 mg/L, within permissible ranges.

Graph 91: The graph shows the monthly variation of *pH* at Zadeshwar Station from April 2015 to April 2025. pH ranged from 6.2 to 8.6, permissible limit (BIS IS10500): 6.5–8.5 (no relaxation), within permissible ranges.

Graph 92: The graph shows the monthly variation of *Phosphate* at Zadeshwar Station from April 2015 to April 2025. Phosphate ranged from 0.02 to .82 mg/L, higher nutrient peaks in monsoon; potential eutrophication risk locally.

Graph 93: The graph shows the monthly variation of *Potassium* at Zadeshwar Station from April 2015 to April 2025. Potassium ranged from 0.2 to 96 mg/L, within environmental ranges.

Graph 94: The graph shows the monthly variation of *Alkalinity as CaCo<sub>3</sub>* at Zadeshwar Station from April 2015 to April 2025. Alkalinity ranged from 100 to 320 mg/L, occasionally elevated values but generally within operational ranges.

Graph 95: The graph shows the monthly variation of *Sodium* at Zadeshwar Station from April 2015 to April 2025. Sodium ranged from 10 to 1980 mg/L, high peaks consistent with estuarine/tidal saline influence; some months exceed common guideline levels (200 mg/L), raising concerns.

Graph 96: The graph shows the monthly variation of *Sulphate* at Zadeshwar Station from April 2015 to April 2025. Sulphate ranged from 4 to 586 mg/L, permissible limit (BIS IS10500): 200 mg/L, exceeds permissible limit in some months.

Graph 97: The graph shows the monthly variation of *Suspended Solids* at Zadeshwar Station from April 2015 to April 2025. Suspended Solids ranged from 2 to 2000 mg/L, considerable variability and high monsoon peaks.

Graph 98: The graph shows the monthly variation of *Temperature* at Zadeshwar Station from April 2015 to April 2025. Temperature ranged from 24 to 32 °C, seasonal.

Graph 99: The graph shows the monthly variation of *Total Coliform* at Zadeshwar Station from April 2015 to April 2025. Total Coliform ranged from 100 to 100,000 MPN/100mL, permissible limit (drinking): 0 MPN/100mL, very high contamination; public-health risk.

Graph 100: The graph shows the monthly variation of *Total Dissolved Solids* at Zadeshwar Station from April 2015 to April 2025. TDS ranged from 60 to 3000 mg/L, permissible limit (BIS IS10500): 2000 mg/L, exceeds permissible limit in some months, consistent with estuarine/tidal saline influence.

Graph 101: The graph shows the monthly variation of *Total Fix Solid* at Zadeshwar Station from April 2015 to April 2025.

Graph 102: The graph shows the monthly variation of *Total Hardness* at Zadeshwar Station from April 2015 to April 2025. Total Hardness ranged from 96 to 1720 mg/L, permissible limit (BIS IS10500): 600 mg/L, exceeds permissible limit in some months, indicating hard water episodes.

Graph 103: The graph shows the monthly variation of *Total Kjeldahl Nitrogen* at Zadeshwar Station from April 2015 to April 2025. TKN ranged from 0.38 to 2.8 mg/L, within reported environmental ranges though some months elevated.

Graph 104: The graph shows the monthly variation of *Turbidity* at Zadeshwar Station from April 2015 to April 2025. Turbidity ranged from 2.0 to 2200.0 NTU, permissible limit (BIS IS10500): 5 NTU, episodic very high turbidity (monsoon/tidal resuspension); exceeds permissible limit and requires attention.

Downstream at Zadeshwar, the water quality reflects the highest pollution load among all monitored stations. Zadeshwar's April 2015–April 2025 record shows severe and frequent water-quality problems that make the water unsafe for direct human consumption and raise ecological concern — most striking are extreme turbidity spikes (up to ~2,200 NTU) and very high microbial loads (total coliforms 100–100,000 MPN/100 mL; fecal coliforms up to 1,400 MPN/100 mL), accompanied by saline/ionic surges (TDS to ~3,000 mg/L, sodium to ~1,980 mg/L, sulphate to ~586 mg/L), very hard-water episodes (hardness to ~1,720 mg/L), large suspended-solid events (to ~2,000 mg/L) and intermittent elevated COD (to ~65 mg/L) and low DO months — patterns consistent with estuarine/tidal influence, monsoon-driven resuspension and likely sewage/industrial inputs. Zadeshwar experiences considerable anthropogenic pressure, requiring enhanced treatment and pollution-control interventions.

#### Overall lower Basin Status

Across April 2015–April 2025 the Narmada shows a clear downstream deterioration. Upstream at Panetha and Garudeshwar many chemical parameters remain broadly within permissible

limits, but both sites show recurrent seasonal/monsoon-driven turbidity spikes and persistent microbial contamination (faecal/total coliforms) that preclude safe drinking without treatment, while Garudeshwar also records intermittent chemical outliers (nitrate, nickel, high sodium) that need source-tracing. Zanor exhibits higher microbial loads, episodic salinity/ionic excursions and turbidity/COD peaks pointing to sewage and saline/industrial influence. Downstream at Zadeshwar the situation is worst: extreme turbidity and suspended solids, massive microbial contamination, large salinity/TDS and hardness episodes and elevated COD — consistent with estuarine/tidal resuspension plus sewage/industrial inputs. Overall, the trend indicates that water quality remains good upstream and progressively declines downstream.

### 3. Pollution Sources

The Narmada River Basin is subject to multiple pollution pressures from domestic, industrial, agricultural, and non-point sources. Each of these contributes differently in terms of pollutant type, intensity, and spatial distribution. Understanding their nature and quantum is essential for assessing the overall pollution load.

#### 3.1 Domestic Wastewater Load

Domestic wastewater load in the Narmada Basin towns is mainly linked with the level of sewerage coverage, household connections, and the ability of pumping stations and drains to handle the generated sewage.

##### 3.1.1 Status of Water Supply Connections

Domestic wastewater is one of the major contributors to river pollution in the basin due to the growing urban population, limited sewage treatment capacity, and incomplete sewerage networks. However, it is also important to note the status of water supply connections in the Narmada Basin district. **Table 1** provides ULB wise perspective on status of water connections in the basin.

The table presents the number of water supply connections across various Urban Local Bodies (ULBs) situated in districts of the Narmada Basin, spanning Madhya Pradesh and parts of Gujarat. In the upper basin, smaller towns like Amarkantak in Anuppur and Mandla in Mandla district each report 2,100 connections, while Dindori has a slightly higher figure of 3,112 connections. Moving to larger urban centers, Jabalpur stands out with 171,228 connections, making it the dominant city in the basin for water supply, while nearby Bhedaghat contributes a modest 1,167 connections. In Narsinghpur district, the main town has 7,500 connections, complemented by 2,478 connections in Saikheda. Narmadapuram (Hoshangabad) adds a significant 24,000 connections, reinforcing its role as a major hub, with Budhni and Bherunda (Nasrullaganj) in Sehore district contributing 1,756 and 6,236 connections, respectively.

In the middle basin, smaller settlements like Nemawar in Dewas account for 1,198 connections, while Omkareshwar in Khargone reports 1,400 connections. The Khargone district shows a cluster of medium-sized towns with substantial coverage: Barwah (5,082), Sanawad (8,000), Mandleshwar (3,340), Maheshwar (5,400), and Anjad (5,000), indicating a relatively well-distributed water supply network. Neighboring Dhar district contributes with Dhamnod (6,417)

and Dharampuri (3,300) connections. In Barwani district, Barwani itself records 11,232 connections, while Sendhwa leads with 12,000 connections, reflecting stronger urban water access in this part of the basin.

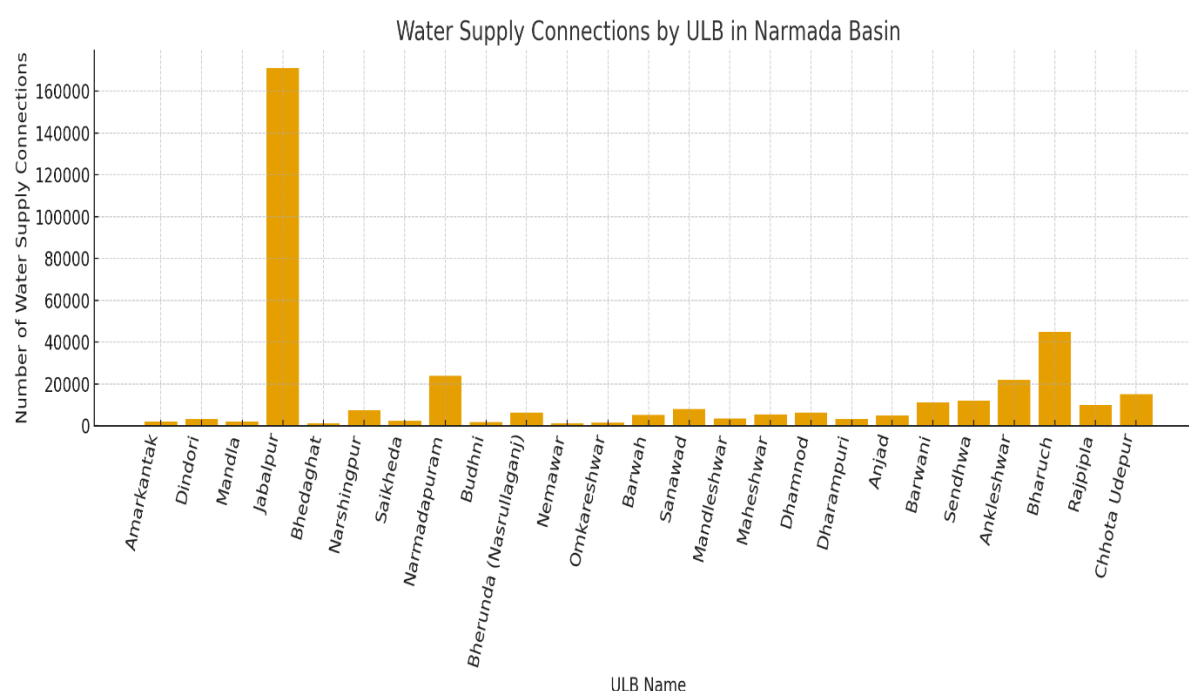
*Table 1 Status of Water Connection in Narmada River Basin Districts*

| <b>Name of the ULB</b>         | <b>District</b> | <b>Number of Water Supply<br/>Connections</b> |
|--------------------------------|-----------------|-----------------------------------------------|
| <b>Amarkantak</b>              | Anuppur         | 2,100                                         |
| <b>Dindori</b>                 | Dindori         | 3,112                                         |
| <b>Mandla</b>                  | Mandla          | 2,100                                         |
| <b>Jabalpur</b>                | Jabalpur        | 171,228                                       |
| <b>Bhedaghat</b>               | Jabalpur        | 1,167                                         |
| <b>Narshingpur</b>             | Narshingpur     | 7,500                                         |
| <b>Saikheda</b>                | Narshingpur     | 2,478                                         |
| <b>Narmadapuram</b>            | Narmadapuram    | 24,000                                        |
| <b>Budhni</b>                  | Sehore          | 1,756                                         |
| <b>Bherunda (Nasrullaganj)</b> | Sehore          | 6,236                                         |
| <b>Nemawar</b>                 | Dewas           | 1,198                                         |
| <b>Omkareshwar</b>             | Khargone        | 1,400                                         |
| <b>Barwah</b>                  | Khargone        | 5,082                                         |
| <b>Sanawad</b>                 | Khargone        | 8,000                                         |
| <b>Mandleshwar</b>             | Khargone        | 3,340                                         |
| <b>Maheshwar</b>               | Khargone        | 5,400                                         |
| <b>Dhamnod</b>                 | Dhar            | 6,417                                         |
| <b>Dharampuri</b>              | Dhar            | 3,300                                         |
| <b>Anjad</b>                   | Khargone        | 5,000                                         |
| <b>Barwani</b>                 | Barwani         | 11,232                                        |
| <b>Sendhwa</b>                 | Barwani         | 12,000                                        |
| <b>Ankleshwar</b>              | Bharuch         | 22,000                                        |
| <b>Bharuch</b>                 | Bharuch         | 45,000                                        |
| <b>Rajpipla</b>                | Narmada         | 10,000                                        |
| <b>Chhota Udepur</b>           | Chhota Udepur   | 15,000                                        |

*\*Source: Urban Development and Housing Department (from Infrastructure Development Report, cNarmada)*

The table also includes towns from the lower basin in Gujarat. Ankleshwar (22,000) and Bharuch (45,000) emerge as major centers, along with Rajpipla in Narmada district (10,000), Chhota Udepur reports 15,000 connections.

In summary, the data on water connections highlights contrasts between large cities like Jabalpur and Bharuch, which dominate in terms of water supply coverage, and smaller towns such as Bhedaghat, Omkareshwar, and Amarkantak, where connections remain relatively limited which is shown in **Graph 105**. The distribution reflects both population concentration and administrative priorities across different districts of the Narmada Basin.



**Graph 105 Narmada Basin, ULB-wise water connections**

*\*Source: Urban Development and Housing Department (from Infrastructure Development Report, cNarmada)*

### 3.1.2 Status of Sewerage Network and Household Connections

The status of sewerage networks and household connections reflects the level of urban infrastructure and plays a vital role in safeguarding river health in the Narmada Basin. The data presented in **Table 2** shows wide variation in progress across different cities and towns, with some demonstrating strong outcomes while others remain stagnant.

Among the leading performers, Bhopal stands out with over 201,900 complete household connections, including more than 80,000 through AMRUT and 30,000 via convergence, making it the most advanced city in the basin. Indore follows closely with 268,812 connections, though only a fraction of these (5,000) were supported under AMRUT. Burhanpur has also

achieved remarkable progress with 26,613 total connections, while Dewas has added over 22,800 connections through convergence, bringing its total to 30,352. These districts represent the strongest achievements in the basin.

Moderate progress is observed in Sagar (28,000 total connections), Khargone (9,649), and Sehore (14,700). Narsinghpur and Mandla have also shown notable outcomes, with 13,100 and 12,842 connections respectively, indicating steady improvements in sewerage connectivity. Smaller but measurable contributions are seen in places like Budhni (2,804), Dharampuri (2,300), Nasrullaganj (2,833), and Mandleshwar (3,846), reflecting localized development efforts.

Some smaller towns in Barwani district—Badwani (1,743), Sendhwa (4,194), and Anjad (1,463)—show incremental improvements, while settlements such as Saikheda (2,721), Barwaha (1,677), and Maheshwar (2,007) have added modest numbers. Even religious and heritage towns like Amarkantak (1,518) and Bhedaghat (1,084) have made contributions, though on a limited scale.

By contrast, several districts such as Betul, Damoh, and Khandwa show no progress, with total sewerage connections remaining at zero. Similarly, Dhamnod has also reported no development under AMRUT or convergence.

Overall, the analysis highlights that Bhopal, Indore, Burhanpur, Dewas, Sagar, Narsinghpur, and Mandla are the front-runners in sewerage connectivity, while districts such as Betul, Khandwa, Damoh, and Dhamnod remain at the lower end with negligible or no coverage. This uneven distribution underscores the need for targeted interventions to strengthen sewerage infrastructure and expand household connections across underserved areas of the Narmada Basin.

*Table 2 Details of Household Service Connections (Sewerage) in the Narmada Basin Cities*

| S. No. | Name of City | Households Covered at Start of Mission (2015- | Household Connections | Total Connections Done Through | Balance | Connections in | Total Connections Done Through | Convergence | Total Connections Done Through | AMRUT & | Total Connections Done |
|--------|--------------|-----------------------------------------------|-----------------------|--------------------------------|---------|----------------|--------------------------------|-------------|--------------------------------|---------|------------------------|
| 1      | Jabalpur     | 0                                             | 96,900                | 62,825                         | 34,075  |                | 5,913                          |             | 68,738                         |         | 68,738                 |
| 2      | Sagar        | 0                                             | 60,173                | 28,000                         | 32,173  |                | 0                              |             | 28,000                         |         | 28,000                 |



|    |              |         |        |        |        |        |         |         |
|----|--------------|---------|--------|--------|--------|--------|---------|---------|
| 3  | Katni        | 9,000   | 29,000 | 0      | 29,000 | 0      | 0       | 9,000   |
| 4  | Chhindwara   | 0       | 0      | 0      | 0      | 28,000 | 21,930  | 21,930  |
| 5  | Damoh        | 0       | 0      | 0      | 0      | 0      | 0       | 0       |
| 6  | Betul        | 0       | 0      | 0      | 0      | 0      | 0       | 0       |
| 7  | Bhopal       | 91,717  | 76,820 | 80,206 | 0      | 30,000 | 110,206 | 201,923 |
| 8  | Burhanpur    | 1,593   | 23,520 | 23,520 | 0      | 1,500  | 25,020  | 26,613  |
| 9  | Dewas        | 7,500   | 0      | 0      | 0      | 22,852 | 22,852  | 30,352  |
| 10 | Hoshangabad  | 1,100   | 0      | 0      | 0      | 459    | 459     | 1,559   |
| 11 | Indore       | 263,812 | 5,000  | 5,000  | 0      | 0      | 5,000   | 268,812 |
| 12 | Khandwa      | 0       | 0      | 0      | 0      | 0      | 0       | 0       |
| 13 | Khargone     | 300     | 9,349  | 9,349  | 0      | 0      | 9,349   | 9,649   |
| 14 | Omkareshwar  | 0       | 0      | 0      | 0      | 1,818  | 1,818   | 1,818   |
| 15 | Pithampur    | 6,455   | 0      | 0      | 0      | 0      | 0       | 6,455   |
| 16 | Sehore       | 500     | 14,200 | 14,200 | 0      | 0      | 14,200  | 14,700  |
| 17 | Bhedaghat    | 0       | 0      | 0      | 0      | 1,084  | 1,084   | 1,084   |
| 18 | Nasrullaganj | 0       | 0      | 0      | 0      | 2,833  | 2,833   | 2,833   |
| 19 | Mandla       | 0       | 0      | 0      | 0      | 12,842 | 12,842  | 12,842  |
| 20 | Narsinghpur  | 0       | 0      | 0      | 0      | 13,100 | 13,100  | 13,100  |
| 21 | Badwani      | 0       | 0      | 0      | 0      | 1,743  | 1,743   | 1,743   |
| 22 | Sendhwa      | 0       | 0      | 0      | 0      | 7,162  | 4,194   | 4,194   |
| 23 | Barwaha      | 0       | 0      | 0      | 0      | 1,677  | 1,677   | 1,677   |
| 24 | Anjad        | 0       | 0      | 0      | 0      | 1,463  | 1,463   | 1,463   |
| 25 | Saikheda     | 0       | 0      | 0      | 0      | 2,721  | 2,721   | 2,721   |
| 26 | Budhni       | 0       | 0      | 0      | 0      | 2,804  | 2,804   | 2,804   |
| 27 | Dharampuri   | 0       | 0      | 0      | 0      | 2,300  | 2,300   | 2,300   |
| 28 | Nemawar      | 0       | 0      | 0      | 0      | 1,226  | 1,226   | 1,226   |

|    |             |   |   |   |   |       |       |       |
|----|-------------|---|---|---|---|-------|-------|-------|
| 29 | Amarkantak  | 0 | 0 | 0 | 0 | 1,518 | 1,518 | 1,518 |
| 30 | Mandleshwar | 0 | 0 | 0 | 0 | 3,846 | 3,846 | 3,846 |
| 31 | Dindori     | 0 | 0 | 0 | 0 | 2,000 | 2,000 | 2,000 |
| 32 | Sanawad     | 0 | 0 | 0 | 0 | 1,021 | 1,021 | 1,021 |
| 33 | Maheshwar   | 0 | 0 | 0 | 0 | 2,007 | 2,007 | 2,007 |
| 34 | Dhamnod     | 0 | 0 | 0 | 0 | 0     | 0     | 0     |

*\*Source: MPPCB, Progress Report of June 2025 for the compliance of NGT*

The sewerage infrastructure across towns in the Lower Narmada Basin shows varied levels of development shown in **Table 3**. In **Rajpipla**, the network is only partially developed, comprising a mix of combined and separate sewer lines depending on locality. Many parts of the city are still not connected to the sewerage system, leading to untreated sewage being discharged into open drains and nearby natural water bodies. In earlier years, a significant portion of wastewater was directly discharged into the Karjan River. However, the Rajpipla Nagarpalika has discontinued this practice and instead reuses wastewater for non-potable purposes such as gardening, road cleaning, and general maintenance. Sewage flow at the treatment plant is measured at the Parshall flume (FIT-101), and the plant operations are automated through SCADA (Supervisory Control and Data Acquisition) for monitoring pumps and treatment units.

In **Ankleshwar** city a comprehensive underground drainage system covering approximately 146 km is under construction. This network serves residential, commercial, and some industrial areas and comprises pipelines of different materials and diameters, including SWR, ductile iron, RCC(Reinforced Cement Concrete), asbestos cement pressure pipes, and cast iron, ranging from 150 mm to 600 mm. Sewage pumping is managed by Ankleshwar Nagarpalika, with multiple stations distributed across the city to handle both sewage and stormwater. The Modinagar station on Hansot Road operates with 70–100 HP(Horsepower) motors, a head of 25 m, and a flow capacity between 300,000 and 600,000 LPH(Litres per Hour), supported by SCADA systems and a 100 kVA DG set(Diesel Generator Set). At Chautabazar, pumping is managed with 30–50 HP units, handling up to 250,000 LPH. Sapna Sarvodaya station has 30–75 HP capacity and handles between 165,000 and 300,000 LPH. Smaller stations exist in Rajeshnagar, Ramnagar, Janakvatika/Radhe Park, Gujarat Housing Board, Tirth Nagar, Anas Motors, and Punit Nagar, with motor ratings typically ranging from 5–30 HP and varying flows, all equipped with panels such as DOL or star-delta and connected to DGVCL(Dakshin Gujarat

Vij Company Limited) approved loads. Together, these stations ensure that sewage from low-lying zones is lifted and conveyed to the STP.

The sewerage network in **Chhotaudepur** is only partially developed and not fully functional due to problems in the rising main pipeline..

In **Bharuch**, the city is divided into five sewerage zones for systematic wastewater collection and management.. The city has an extensive network with pipelines totaling 118,138 m in length, built primarily of RCC NP3 and NP4 pipes of diameters ranging from 200 mm to 1200 mm. There are 5,910 manholes of various types and 166 vertical drops across the system, which ensure proper flow and collection. Household connectivity to the sewer network is provided in all five zones. Sewage conveyance is achieved primarily through gravity flow. Pumping arrangements exist mainly at the STP, where Return Activated Sludge (RAS) pumps run in continuous auto mode with manual options, while Surplus/Waste Activated Sludge (SAS/WAS) pumps are operated on PLC(Programmable Logic Controller)-based timed and totalized modes. Thickener and dewatering feed pumps are operated in both auto and manual modes. The system is fully automated with SCADA and PLC controls, supported by sensors for flow, DO, ORP(Oxidation Reduction Potential), and level, along with valves equipped with actuators and blowers with variable frequency drives. This ensures continuous and reliable operation.

In rural parts of the lower Narmada basin, most settlements rely on on-site sanitation systems such as household toilets connected to septic tanks or leaching pits, with coverage of individual household latrines significantly improved under the Swachh Bharat Mission. However, piped sewer networks are rare, with only small towns or larger villages having partial underground drains or open drains.

*Table 3 Sewerage Connections status in Lower Narmada basin*

| <b>Town/Area</b> | <b>Sewerage Connection Status</b> |
|------------------|-----------------------------------|
| Rajpipla         | Partial network                   |
| Ankleshwar       | 146 km network                    |
| Chhotaudepur     | Partial, rising main issues       |
| Bharuch          | 5 zones, 118 km pipes             |
| Rural Areas      | Mostly on-site                    |

*\*Source: Municipality data, GPCB District environment plan*

### 3.1.3 Status of Domestic Sewage Load

The **Table 4 and 5** provides a detailed overview of domestic sewage generation across districts which also shown in **graph 106**. It is expressed in Million Litres per Day (MLD). It reflects the interaction between population size, urbanization, water supply infrastructure, and socio-economic development in each region. The most notable observation is that Jabalpur, with 230 MLD, emerges as the largest contributor to domestic sewage, which can be attributed to its status as a major urban center hub in Madhya Pradesh. The high-volume highlights both the density of its population and the relatively wide coverage of piped water supply that results in greater wastewater discharge.

Similarly, Damoh (136 MLD), Betul (100 MLD), and Chhindwara (100 MLD) are also significant contributors despite being smaller than Jabalpur in population size, indicating the rapid pace of urban growth and rising domestic water consumption in these towns.

A second category of districts can be identified as medium-level sewage generators, with values ranging between 20–60 MLD. This group includes Bharuch (~35.5 MLD), Dhar (47.4 MLD), Sagar (40 MLD), Raisen (39 MLD), and Sehore (38 MLD). These districts are characterized by medium size urban settlements, expanding municipal coverage, and growing economic activity. Within this category, Burhanpur (27.76 MLD), Khargone (26 MLD), Katni (23 MLD), and Dewas (22 MLD) reflect smaller but steadily urbanizing regions, where sewage generation is already considerable and is expected to grow further in the coming years (Fig. 4).

The low sewage generation districts form the third category, producing less than 20 MLD of wastewater. These include Seoni (17.5 MLD), Harda (11.8 MLD), Barwani (12.31 MLD), and

*Table 4 District Wise Status of Domestic Sewerage Waste Generation, Narmada Basin'*

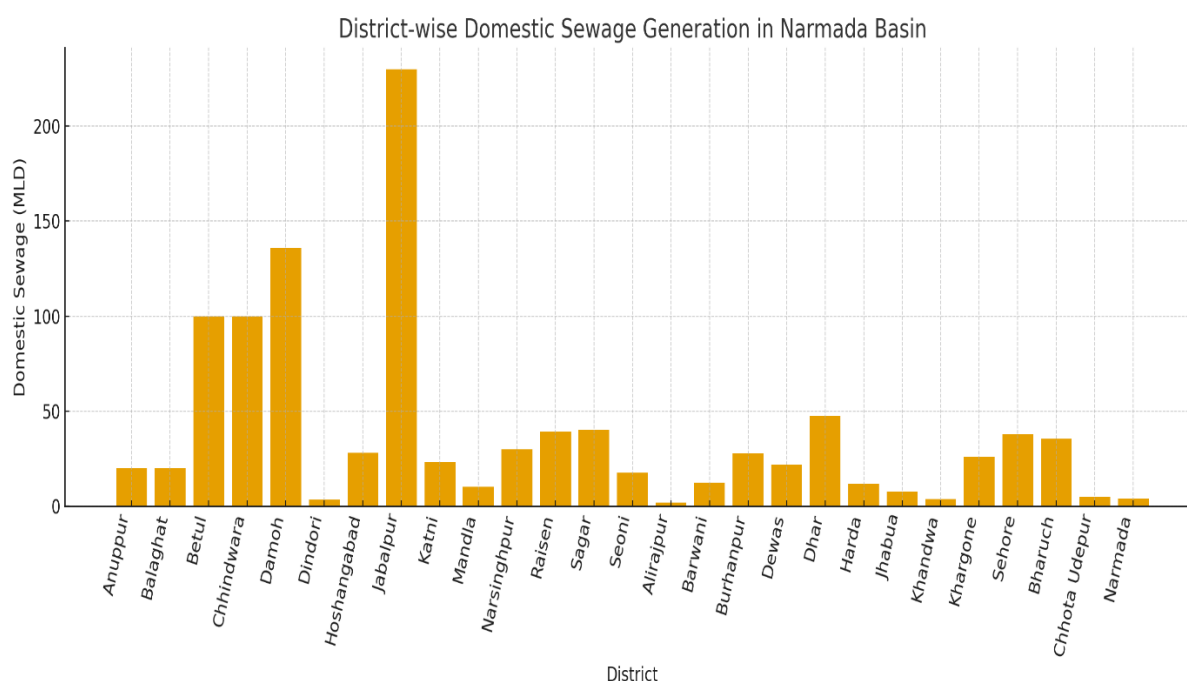
| District   | Domestic Sewage (MLD) |
|------------|-----------------------|
| Anuppur    | 20.00                 |
| Balaghat   | 20.00                 |
| Betul      | 100.00                |
| Chhindwara | 100.00                |

| <b>District</b> | <b>Domestic Sewage (MLD)</b> |
|-----------------|------------------------------|
| Damoh           | 136.00                       |
| Dindori         | 3.49                         |
| Hoshangabad     | 28.00                        |
| Jabalpur        | 230.00                       |
| Katni           | 23.00                        |
| Mandla          | 10.25                        |
| Narshimapur     | 30                           |
| Raisen          | 39                           |
| Sagar           | 40                           |
| Seoni           | 17.50                        |
| Alirajpur       | 1.80                         |
| Barwani         | 12.31                        |
| Burhanpur       | 27.76                        |
| Dewas           | 22                           |
| Dhar            | 47.40                        |
| Harda           | 11.80                        |
| Jhabua          | 7.64                         |
| Khandwa         | 3.64                         |
| Khargone        | 26                           |
| Sehore          | 38                           |

| District           | Domestic Sewage (MLD) |
|--------------------|-----------------------|
| Bharuch            | ~35.5                 |
| Chhota udepur      | 5                     |
| Narmada (District) | ~4                    |

*\*Source: District Environment Plan, MPPCB & GPCB (from Narmada River Basin Infrastructure and Planning Report*

Mandla (10.25 MLD), which are typically semi-urban districts with modest population bases and lower levels of water infrastructure coverage compared to the larger cities. At the bottom end of the scale are predominantly tribal and rural districts such as Jhabua (7.64 MLD), Chhota Udepur(5MLD), Narmada(4MLD), Dindori (3.49 MLD), Khandwa (3.64 MLD), and Alirajpur (1.8 MLD). In these areas, the combination of sparse urban settlements, limited household water connections, and reliance on non-piped sources of water results in lower sewage generation.



**Graph 106 Domestic Sewage Generation in Narmada River Basin**

Thus, the status of district wise sewage generation shows a clear difference of from very high loads in major urban centers like Jabalpur and Damoh, to medium loads in growing towns such as Dhar, and Sagar, down to very small loads in tribal and rural districts like Alirajpur and Dindori. These insights are crucial for planning wastewater treatment facilities: large,

centralized treatment plants will be necessary in high-load districts, while smaller decentralized systems or on-site sanitation measures may be more appropriate in low-load, dispersed regions.

- **Observations from the Kirtikumar Sadashiv Bhatt vs Narmada Water Resources Water Supply Department** (No.71/2023(CZ) (O.A.No.97/2021-WZ)

**1. Pollution Hotspots Identified:**

- CPCB declared stretches from Mandla–Bhedaghat and Sethani Ghat–Nemawar as highly polluted.
- Jabalpur stretch is marked critically polluted.

**2. STP Gaps:**

- Most basin towns lack functional STPs.
- Even where STPs exist, several are non-operational or outdated (UASB technology) and need upgrading to SBR or advanced systems.

**3. NGT Directives (Oct 2023 Order):**

- District Collectors of Narmada towns directed to submit sewage generation & STP status within 30 days.
- Encroachment on riverbanks/floodplains must be removed.
- Old/non-functional STPs to be upgraded.
- Functional STPs, CETPs, and ETPs must be installed to address treatment gaps.

**4. Enforcement & Accountability:**

- MPPCB filed 9 criminal prosecutions against defaulting municipalities discharging untreated sewage.
- ₹12 crore environmental compensation imposed on 10 municipalities.
- Industries near the catchment ordered to adopt Zero Liquid Discharge (ZLD) using ETPs, MEEs, and ATFDs.

**5. Supreme Court & NGT Benchmarks:**

- 31 March 2018 was the original deadline for STP/ETP completion (missed).
- Delays beyond 31 March 2021 attract ₹10 lakh/month penalty per STP.
- Untreated sewage discharge is a violation of Water Act, 1974 and attracts strict penalties.

**6. Key Concern:** Despite monitoring for years, large-scale gaps persist. Around 51 MLD untreated sewage daily still reaches the Narmada, degrading drinking water quality and public health.

*Table 5 Status of Sewage Generation and Treatment*

| City/Town    | Sewage Generation (MLD) | Treatment Available                                                                                               | Remarks                                                    |
|--------------|-------------------------|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| Amarkantak   | 0.98 MLD                | No STP; 1.2 MLD STP under construction                                                                            | Untreated sewage currently discharged                      |
| Dindori      | 2.49 MLD                | No STP; 3.8 MLD STP under construction                                                                            | Untreated sewage                                           |
| Mandla       | 10.25 MLD               | No STP; 2 STPs (2 MLD & 7.75 MLD) under construction, 1 STP (0.5 MLD) not working                                 | Large untreated discharge                                  |
| Jabalpur     | 143.68 MLD              | Partial treatment: 83.43 MLD by 8 operational STPs; 60 MLD in-situ bioremediation till 34 & 29 MLD STPs are ready | Major treatment hub, but still discharges untreated sewage |
| Narmadapuram | 12 MLD                  | No STP; 21 MLD STP proposed                                                                                       | Entire load untreated                                      |
| Budhni       | 3.295 MLD               | Yes; 3 STPs operational                                                                                           | 100% treated                                               |
| Nemawar      | 4.913 MLD               | No STP; 1 MLD proposed                                                                                            | Untreated                                                  |
| Omkareshwar  | 1.0866 MLD              | Yes; 4 STPs (0.65 MLD total)                                                                                      | Partially treated                                          |
| Barwaha      | 3.481 MLD               | No STP; 3.75 MLD under construction                                                                               | Untreated                                                  |
| Sanawad      | 5.097 MLD               | No STP; 7.02 MLD under construction                                                                               | Untreated                                                  |
| Mandleshwar  | 1.624 MLD               | No STP; 3 MLD under construction                                                                                  | Untreated                                                  |
| Maheshwar    | 3.212 MLD               | No STP; 4.91 MLD under construction                                                                               | Untreated                                                  |
| Badwani      | 7.303 MLD               | No STP; 9 MLD under construction                                                                                  | Untreated                                                  |
| Dhar         | 1.5 MLD                 | Yes, STP of 2 MLD operational                                                                                     | Treated                                                    |



|               |        |                                      |           |
|---------------|--------|--------------------------------------|-----------|
| Bharuch       | 28MLD  | Yes, STP of 29.3 MLD operational     | Treated   |
| Ankleshwar    | 7.5MLD | No, STP of 14 MLD under construction | Untreated |
| Rajpipla      | 4.5MLD | Yes, STP of 5.5 MLD operational      | Treated   |
| Chhota udepur | 4MLD   | Yes, STP of 5 MLD operational        | Treated   |

*\*Source: Kirtikumar Sadashiv Bhatt vs Narmada Water Resources Water Supply Department (No.71/2023(CZ) (O.A.No.97/2021-WZ) before NGT and GPCB District Environment Plan*

## 3.2 Industrial Wastewater Load

Industrial wastewater load represents one of the major sources of pollution in urban and peri-urban regions as well as in dedicated industrial areas. It is generated from various sectors such as manufacturing, textiles, chemicals, pharmaceuticals, food processing, and mining, often containing high concentrations of organic matter, heavy metals, oils, and toxic chemicals. Unlike domestic wastewater, industrial effluents are more complex in nature and require specialized treatment before discharge. However, in many areas, industries either lack adequate treatment facilities or operate them inefficiently, leading to the release of untreated or partially treated wastewater into rivers, streams, and open lands. This not only degrades water quality but also poses risks to aquatic ecosystems, agriculture, and human health. Effective regulation, adoption of cleaner technologies, and enforcement of effluent treatment standards are critical to reducing the industrial wastewater load and its environmental impacts.

The lower Narmada basin has many industries. These industries produce large amounts of wastewater every day. Most of the wastewater comes from chemical, pharmaceutical, textile, pulp and paper, and petrochemical units. Some areas like Bharuch and Ankleshwar have very high wastewater generation, while smaller towns like Rajpipla and Chhota Udepur produce much less. Proper treatment and management of this wastewater is very important for protecting the water quality of the river.

### 3.2.1 Major Industrial Clusters in the Narmada River Basin

#### 1. Jabalpur (Madhya Pradesh)

Jabalpur hosts a diverse industrial base grounded in both defence and manufacturing. Its industrial profile includes the Ordnance Factory units—the Vehicle Factory Jabalpur, Gun

Carriage Factory, and Grey Iron Foundry—supporting defence production. Beyond this, the district hosts a range of industries such as ready-made garments, poultry, electrical goods, sawmills, limestone and building materials, glassware, furniture, cement, and food processing, complemented by IT infrastructure like Techno Park.

## **2. Narsinghpur (Madhya Pradesh)**

Industrial activity in Narsinghpur remains predominantly agro based. Key industries include agricultural equipment, pulse (dal) mills, oil mills, gur (jaggery) and sugar production, beedi manufacturing, and ancillary sectors like paper, plastic, leather goods, and pottery. The district also holds mineral resources such as limestone, fireclay, and soapstone, fuelling cement and utensil production.

## **3. Khandwa – East Nimar (Madhya Pradesh)**

Notable industries include edible oil mills, cotton ginning, and power generation—specifically the Sant Singaji and Dada Dhuniwale Thermal Power Plants, supported by supplementary solar power infrastructure.

## **4. Hoshangabad (Madhya Pradesh)**

The town houses a singular significant industrial entity—the Security Paper Mill—which discharges treated industrial effluent into the Narmada.

## **5. Bharuch, Dahej & Ankleshwar (Gujarat)**

- **Bharuch district**, situated at the Narmada River’s mouth, is one of the most heavily industrialized regions in India. It includes sectors such as chemicals and petrochemicals, pharmaceuticals, textiles, engineering, dairy products, and agro processing like peanut processing. It also hosts substantial minerals including lignite, silica sand, and agate.
- **Ankleshwar**, within Bharuch, is a major chemical industrial estate. It contributes over 5% of India’s chemical output, specializing in dyes, pharmaceuticals, and industrial chemicals.
- **Dahej**, near Bharuch, is part of a major Petroleum, Chemicals, and Petrochemicals Investment Region (PCPIR), produces polymers, petrochemicals, and intermediates.

Major companies like Reliance, Adani, ONGC, Torrent, and Birla Copper are established here; it also features a significant port infrastructure.

- Additionally, **Safex Chemicals** inaugurated its largest manufacturing facility in Bharuch in April 2025, expanding its production of specialty chemicals (Business Standard, 29<sup>th</sup> May 2025)
- A **bulk drug park** is under development at Jambusar (in Bharuch district), covering 815 hectares (cmogujrat.gov.in, 4<sup>th</sup> August 2025)

### 3.2.1.1 Mineral-Based Industries

The Narmada Basin in Madhya Pradesh hosts a variety of mineral-based industries that

*Table 6 Major Mineral-Based Industries and Their Locations in the Narmada Basin, Madhya Pradesh*

| Sr. No. | Industries                | Location                         |
|---------|---------------------------|----------------------------------|
| 1       | Cement                    | Damoh                            |
| 2       | Thermal Power             | Betul, Damoh                     |
| 3       | Coal Ossuary              | Narsinghpur, Annuppur, Chindwara |
| 4       | Asbestos Cement Sheet     | Katni                            |
| 5       | Ceramic                   | Jabalpur                         |
| 6       | Hydrated Lime             | Katni                            |
| 7       | Refractories              | Katni, Jabalpur                  |
| 8       | Roofing Tiles             | Hoshangabad, Balaghat            |
| 9       | Marble cutting, Polishing | Katni                            |

*\*Source: INDUSTRIAL PROFILE OF MADHY PRADESH 2016 – 17,*

leverage the region's rich mineral resources listed in **Table 6**. Cement industries are concentrated in Damoh, supporting the construction sector. Thermal power plants operate in Betul, Damoh contributing to regional energy generation. Coal-related activities, including ossuaries, are present in Narsinghpur, Anuppur, and Chhindwara, while Katni hosts asbestos cement sheet and hydrated lime production. Ceramic industries are in Jabalpur. Refractory materials are produced in Katni, and Jabalpur, whereas roofing tiles industries are found in

Hoshangabad and Balaghat. Additionally, marble cutting and polishing activities are carried out in Katni. These industries collectively play a significant role in the economic development and industrial landscape of the Narmada Basin.

In Lower basin, many industries are linked to minerals. At Dahej, big chemical and petrochemical plants make caustic soda, soda ash, chlorine and fertilizers. These use minerals like salt, limestone and gypsum. Vilayat has Grasim/Birla Cellulose, which makes viscose fibre using limestone and caustic soda. Ankleshwar, Panoli and Jhagadia also have many chemical and pharma industries that depend on minerals as feedstock. Smaller towns like Tilakwada and Rajpipla have stone crushing, brick kilns and building material units that use local stone and clay. Sankheda, on the other hand, is known for wooden furniture and handicrafts, and does not depend much on minerals.

### 3.2.1.2 Food Parks

The Narmada Basin hosts several food parks that promote agro-based industries and food processing listed in **Table 7**, supporting local economies and enhancing value addition to agricultural products. These parks are strategically located across different districts, with varying coverage of the basin.

*Table 7 Food Parks and Their Coverage in the Narmada Basin, Madhya Pradesh*

| Location         | District    | Narmada Basin Coverage |
|------------------|-------------|------------------------|
| Borgaon          | Chhindwara  | Partly                 |
| Nimrani          | Khargone    | Fully                  |
| Babai – Pipariya | Hoshangabad | Fully                  |
| Maneri           | Mandla      | Fully                  |

*\*Source: Industrial Profile of Madhya Pradesh 2016–17*

In Lower basin Food and agro industries are also present in some estates. Bharuch GIDC(Gujarat Industrial Development Corporation) has several food units such as Nishant Food Industries, Bharuch Food Products, Jabsons Foods and Jay Bhavani Food Products. These make snacks, namkeen and sweets. Dahej SEZ(Special Economic Zone) does not have large food-processing units, but one company makes synthetic food-grade colours. Most estates in Ankleshwar, Panoli, Dahej and Vilayat are mainly chemical and do not have big food parks. Smaller estates in Rajpipla, Dediapada and Tilakwada have agro and food-based trade such as edible oil, pulses and spices, but they are small in scale.

### 3.2.1.3 Agri Export Zones

The Narmada Basin in Madhya Pradesh supports several Agricultural Export Zones (AEZs) listed in **Table 8**, which focus on high-value crops for national and international markets. These zones promote agro-based industrial growth, enhance farmers' income, and facilitate the supply of quality produce from the region.

*Table 8 Agri Export Zones and Their Coverage in the Narmada Basin, Madhya Pradesh*

| Produce                  | Coverage (Narmada Basin Districts)                                   |
|--------------------------|----------------------------------------------------------------------|
| Potato, Onion & Garlic   | Dhar, Indore, Dewas                                                  |
| Wheat (Durum & Sharbati) | Dewas, Indore, Dhar, Sehore, Raisen, Hoshangabad, Harda, Narsinghpur |
| Pulses (Lentil & Gram)   | Raisen, Narsinghpur, Chhindwara                                      |
| Oranges                  | Chhindwara, Hoshangabad, Betul                                       |

*\*Source: INDUSTRIAL PROFILE OF MADHY PRADESH 2016 – 17*

Many GIDC estates in the lower basin are located inside Agri Export Zones (AEZ). These AEZs mainly focus on mango and vegetables. The estates that fall in AEZs include Vagra, Panoli, Nabipur, Valia, Naldhari, Bharuch, Dahej, Atali-Kaladra, Palej, Ankleshwar, Jhagadia, Pavi-Jetpur, Tilakwada, Dediapada and Rajpipla. In these places, small agro trade and some agro-processing exist. However, large food export parks are limited, and most of the AEZ areas are still dominated by chemical and engineering industries.

### 3.2.1.4 Central Public Sector Undertaking

The Narmada Basin hosts several Central Public Sector Undertakings (CPSUs) and Central Government ministerial units listed in **Table 9**, contributing to industrial development, defence production, and regional employment. These undertakings operate across various districts, providing products, services, and infrastructure support to the basin.

*Table 9 Central Public Sector Undertakings and Their Operational Presence in the Narmada Basin, Madhya Pradesh*

| Category                          | Undertaking                         | HQ / District | Operational Presence in Narmada Basin Districts        |
|-----------------------------------|-------------------------------------|---------------|--------------------------------------------------------|
| Central Public Sector Undertaking | Bharat Heavy Electricals Ltd (BHEL) | Bhopal        | Units/projects in Bhopal, supply to Hoshangabad, Harda |

|                                                      |                                   |                     |                                                      |
|------------------------------------------------------|-----------------------------------|---------------------|------------------------------------------------------|
| <b>Central Govt.<br/>Ministerial<br/>Undertaking</b> | Manganese Ore                     | Balaghat            | Mining operations in Balaghat (Tirodi mines)         |
|                                                      | India Ltd (MOIL)                  |                     |                                                      |
|                                                      | Hindustan Copper Ltd, Malajkhanda | Balaghat            | Copper mining at Malajkhanda (Balaghat)              |
|                                                      | Security Paper Mill               | Hoshangabad         | Plant at Hoshangabad (now Narmadapuram)              |
|                                                      | Bank Note Press                   | Dewas               | Printing currency notes, serves Indore/Ujjain region |
|                                                      | Ordnance Factory                  | Itarsi, Hoshangabad | Ammunition/defence supplies to basin districts       |
|                                                      | Ordnance Factory                  | Katni               | Defence manufacturing, Katni area                    |
|                                                      | Ordnance Factory, Khamariya       | Jabalpur            | Major ordnance facility in Narmada Basin             |
|                                                      | Defence Vehicle Factory           | Jabalpur            | Production/maintenance of defence vehicles           |
|                                                      | Gun Carriage Factory              | Jabalpur            | Artillery systems, defence industry hub              |
|                                                      | Telecom Factory                   | Jabalpur            | Telecom equipment, supplies within basin             |
|                                                      | Heavy Vehicle Factory             | Jabalpur            | Heavy defence vehicle production                     |
|                                                      | Rail Coach Repair Workshop        | Bhopal              | Overhauls serving Narmada region railways            |
|                                                      | Railway Zone (HQ)                 | Jabalpur            | Southeast Central Railway HQ, full basin coverage    |
|                                                      | Gray Iron Foundry                 | Jabalpur            | Foundry products, defence & civil sector supplies    |

*\*Source: Industrial Profile of Madhya Pradesh 2016-17,*

Some central public sector companies are also located in the lower basin. ONGC(Oil and Natural Gas Corporation) has a role in developing Dahej SEZ and is one of its promoters. OPaL(ONGC Petro Additions Limited), which is a joint venture of ONGC, GAIL and GSPC, has a large petrochemical complex at Dahej. Petronet LNG Ltd. has its LNG terminal in the

Dahej port area. These public sector undertakings play a major role in petrochemical and energy industries in the region.

### 3.2.1.5 State's Public Sector Undertakings

The Narmada Basin is supported by numerous State Public Sector Undertakings (PSUs) listed in **Table 10**, that contribute to industrial development, agro-processing, energy, tourism, and social welfare. These undertakings operate across multiple districts, providing infrastructure, financial support, and sectoral services to strengthen regional development.

*Table 10 State Public Sector Undertakings and Their Operational Presence in the Narmada Basin, Madhya Pradesh*

| Corporation / Board                             | Headquarters | Operational Presence in Narmada Basin Districts                                    |
|-------------------------------------------------|--------------|------------------------------------------------------------------------------------|
| M.P. Financial Corporation                      | Indore       | Dhar, Dewas, Khargone, Khandwa, Barwani                                            |
| M.P. Small Industries Corporation (Laghu Udyog) | Bhopal       | Jabalpur, Hoshangabad, Harda, Narsinghpur                                          |
| M.P. State Electronics Development Corp. Ltd.   | Bhopal       | Jabalpur, Indore, Hoshangabad                                                      |
| M.P. State Industrial Development Corporation   | Bhopal       | Jabalpur (AKVN), Indore (AKVN), Dhar, Dewas                                        |
| M.P. Textbook Corporation                       | Bhopal       | Distribution depots in Jabalpur, Hoshangabad                                       |
| M.P. Tourism Development Corporation            | Bhopal       | Mandla (Kanha), Jabalpur (Bhedaghat), Omkareshwar (Khandwa), Hoshangabad (Satpura) |
| M.P. Women Finance & Development Corporation    | Bhopal       | Training / finance cells in Jabalpur, Narsinghpur                                  |
| M.P. Agency for Promotion of IT (MAP_IT)        | Bhopal       | Indore, Jabalpur IT parks                                                          |
| M.P. Housing Board                              | Bhopal       | Housing projects in Jabalpur, Hoshangabad, Harda, Khandwa                          |
| M.P. Paschim Kshetra Vidyut Vitran              | Indore       | Khargone, Khandwa, Barwani, Dhar, Harda                                            |

|                                                  |          |                                                            |
|--------------------------------------------------|----------|------------------------------------------------------------|
| M.P. Poorv Kshetra Vidyut                        | Jabalpur | Narsinghpur, Hoshangabad, Seoni, Balaghat                  |
| M.P. Audhyogik Kendra                            | Indore   | /                                                          |
| Vikas Nigam (AKVN)                               | Bhopal   | Regional AKVN Jabalpur (Narmada Basin coverage)            |
| M.P. Dugdh Vikas Nigam                           | Bhopal   | Dairy units in Jabalpur, Hoshangabad, Narsinghpur          |
| M.P. Energy Development Corporation (Urja Nigam) | Bhopal   | Renewable energy projects in Jabalpur, Mandla, Hoshangabad |
| M.P. Khadi & Village Industries Board            | Bhopal   | Khadi units in Jabalpur, Hoshangabad, Sehore               |
| M.P. Handicrafts & Handlooms Dev. Corp.          | Bhopal   | Crafts clusters in Jabalpur, Mandla, Narsinghpur           |
| M.P. State Agro-Industries Dev. Corporation      | Bhopal   | Agro service centers in Narsinghpur, Hoshangabad, Harda    |
| M.P. State Civil Supplies Corporation            | Bhopal   | Godowns in Jabalpur, Hoshangabad, Harda, Sehore            |
| M.P. State Forest Development Corporation        | Bhopal   | Plantation areas in Mandla, Jabalpur, Narsinghpur          |
| M.P. State Mineral Development Corporation       | Bhopal   | Mining sites in Balaghat, Jabalpur, Katni                  |
| M.P. State Pashudhan Evam Kukkut Vikas Nigam     | Bhopal   | Poultry / livestock units in Hoshangabad, Jabalpur         |
| M.P. State Seed & Farms Development Corporation  | Bhopal   | Seed farms in Hoshangabad, Narsinghpur, Harda              |
| M.P. State Warehousing Corporation               | Bhopal   | Warehouses in Jabalpur, Hoshangabad, Harda, Sehore         |

*\*Source: INDUSTRIAL PROFILE OF MADHY PRADESH 2016 – 17*

The state public sector companies are also important in the lower basin. Gujarat Alkalies and Chemicals Limited (GACL) has a large unit at Vilayat. Gujarat State Fertilizers & Chemicals Ltd. (GSFC) and Gujarat Narmada Valley Fertilizers & Chemicals Ltd. (GNFC) are both located in Bharuch. Dahej SEZ Ltd. is another important state company. These state undertakings are linked with chemicals, fertilizers and petrochemicals and add to the wastewater load in the basin.



### 3.2.1.6 Industrial Areas Managed by DTICs and GIDC

The Narmada Basin hosts numerous industrial areas managed by the District Trade and Industry Centres (DTICs) to promote regional industrialization and economic growth listed in **Table 11**. These areas provide developed land for industries, supporting manufacturing, trade, and services. The industrial land development varies across districts, with some areas fully developed and others partially developed, reflecting ongoing expansion and infrastructure improvement. These industrial zones play a significant role in attracting investment, generating employment, and boosting the industrial base of the basin.

*Table 11 Industrial Areas Managed by DTICs and Their Development Status in the Narmada Basin, Madhya Pradesh*

| Sr. No. | District    | Industrial Land Acquired (ha) | Land Developed (ha) | Coverage |
|---------|-------------|-------------------------------|---------------------|----------|
| 1       | Barwani     | 33.213                        | 8.168               | Fully    |
| 2       | Betul       | 240.210                       | 72.270              | Partly   |
| 3       | Bhopal      | 360.696                       | 406.060             | Partly   |
| 4       | Dewas       | 438.859                       | 286.717             | Fully    |
| 5       | Dhar        | 52.763                        | 5.128               | Fully    |
| 6       | Harda       | 49.440                        | 98.000              | Fully    |
| 7       | Hoshangabad | 97.936                        | 97.936              | Fully    |
| 8       | Indore      | 576.450                       | 415.020             | Partly   |
| 9       | Jabalpur    | 249.160                       | 169.630             | Fully    |
| 10      | Khandwa     | 172.410                       | 12.900              | Fully    |
| 11      | Khargone    | 202.650                       | 200.630             | Fully    |
| 12      | Mandla      | 517.210                       | 162.360             | Fully    |
| 13      | Narsinghpur | 3.246                         | 2.000               | Fully    |
| 14      | Raisen      | 44.537                        | 44.480              | Partly   |
| 15      | Sehore      | 54.290                        | 20.250              | Fully    |

*\*Source: INDUSTRIAL PROFILE OF MADHY PRADESH 2016 – 17*

The Gujarat Industrial Development Corporation (GIDC) manages many industrial estates in the lower basin. Vagra and Vilayat have large chemical and fibre industries. Panoli is famous for chemicals, dyes and pharmaceuticals. Nabipur has smaller units like plastics and engineering. Valia has metals, packaging and some chemicals. Naldhari has small industries like plastics, packaging and pharma. Bharuch GIDC has a mix of chemicals, textiles, food

processing and engineering. Dahej has very large petrochemical and chemical industries and a big SEZ. Palej is known for dyes, drugs and plastics. Ankleshwar is one of the largest chemical and pharmaceutical estates in India. Jhagadia is also a big chemical estate. Sankheda is special for wood craft and furniture. Pavi-Jetpur has small engineering and agro units. Jambughoda has small agro and forest-based units. Tilakwada, Dediapada and Rajpipla have small agro, food and textile industries.

### 3.1.1.7 Clusters by MSME-DI Indore

The Narmada Basin hosts several Micro, Small, and Medium Enterprise (MSME) clusters promoted by the MSME Development Institute (DI) in Indore depicted in **Table 12**. These clusters focus on specific industrial or agro-based activities, facilitating production, skill development, and entrepreneurship. While some clusters partially cover the basin, others are fully located within it, supporting local employment and contributing to the regional economy.

*Table 12 MSME Clusters and Their Coverage in the Narmada Basin, Madhya Pradesh*

| Sr. No. | Cluster                    | District | Coverage in Basin |
|---------|----------------------------|----------|-------------------|
| 1       | Engineering Cluster        | Bhopal   | Partly            |
| 2       | Namkeen Cluster            | Indore   | Partly            |
| 3       | MPPMO Pharma Cluster       | Indore   | Partly            |
| 4       | Indore Pharma Cluster      | Indore   | Partly            |
| 5       | Plastic Packaging Cluster  | Indore   | Partly            |
| 6       | Rechargeable Torch Cluster | Indore   | Partly            |
| 7       | Readymade Garment Cluster  | Indore   | Partly            |
| 8       | Power Loom Cluster         | Jabalpur | Fully             |

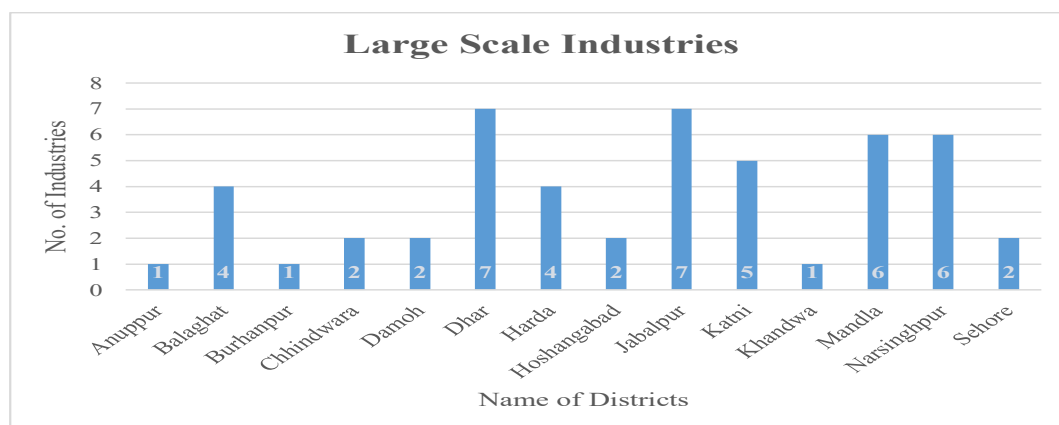
*\*Source: INDUSTRIAL PROFILE OF MADHY PRADESH 2016 – 17*

### 3.2.1.8 Large and Medium Scale Industries

The Narmada Basin hosts a diverse industrial landscape, encompassing large-scale (**Graph 107**) and medium-scale industries (**Graph 108**) across multiple districts. These industries span sectors such as cement, power, mining, pharmaceuticals, textiles, sugar, steel, and agro processing. Large-scale industries, including Bharat Heavy Electricals, Hindustan Copper, Diamond Cement, Trident Ltd., and Hindustan Liver Limited, serve as key drivers of economic growth and employment. Medium-scale industries, particularly concentrated in industrial

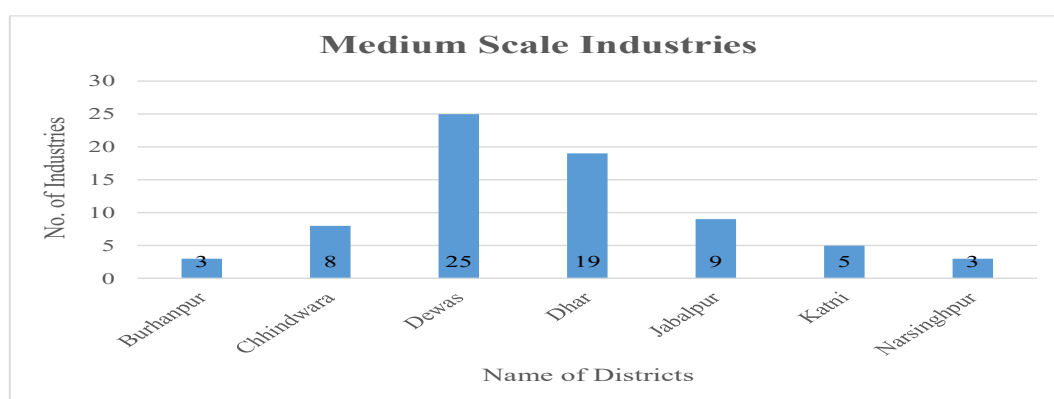
growth centres like Dhar (Pithampur), Dewas and Jabalpur complement these large units by supporting ancillary production, manufacturing, and service industries. Fig. 5 and 6 highlights the number of large as well as medium scale industries in different districts.

These industries are strategically distributed to leverage local resources, labour availability, and connectivity, contributing significantly to the basin's industrial and socio-economic development. While the complete list of industries is provided in **Annexure Table A3 and A4**.



**Graph 107 Distribution of Large-Scale Industries Across Districts**

\*(Source: INDUSTRIAL PROFILE OF MADHY PRADESH 2016 – 17)



**Graph 108 Distribution of Medium-Scale Industries Across Districts**

\*(Source: INDUSTRIAL PROFILE OF MADHY PRADESH 2016 – 17)

In lower basin Large and medium industries are located mainly in Bharuch district. In Vagra and Dahej, Reliance Industries, OPaL and other big petrochemical companies operate. L&T Chemicals and Deepak Nitrite are also present in Vagra. Panoli has companies like Clariant, Atul Ltd. and GACL. Nabipur has Gujarat Fluorochemicals and Bharuch Enviro Infrastructure. Vilayat has Birla Cellulose and Sud Chemie. Palej has Aarti Industries. Ankleshwar has Atul Ltd., Sun Pharma and Intas Pharma. Jhagadia has PI Industries and Excel Industries. These large industries create a big share of wastewater and pollution load in the basin.

### 3.2.2 Status of Industrial Sewage Generation

*Table 13 District Wise Status of Industrial Sewerage Waste Generation, Narmada Basin*

| District    | Industrial Sewage (MLD) |
|-------------|-------------------------|
| Anuppur     | 3.90                    |
| Balaghat    | 16.00                   |
| Betul       | 51.99                   |
| Chhindwara  | 46.33                   |
| Damoh       | 0.00                    |
| Dindori     | 0.00                    |
| Hoshangabad | 25.00                   |
| Jabalpur    | 8.00                    |
| Katni       | 0.14                    |
| Mandla      | 0.90                    |
| Narshimapur | 1006.00                 |
| Raisen      | 13.80                   |
| Sagar       | 15.30                   |
| Seoni       | 9.50                    |
| Alirajpur   | 0.00                    |
| Barwani     | 1.00                    |
| Burhanpur   | 1.07                    |
| Dewas       | 4.50                    |
| Dhar        | 18.60                   |

| District             | Industrial Sewage (MLD) |
|----------------------|-------------------------|
| Harda                | 0.11                    |
| Jhabua               | 0.72                    |
| Khandwa              | 39.96                   |
| Khargone             | 22.00                   |
| Sehore               | 22.00                   |
| Bharuch              | ~500.00                 |
| Ankleshwar (Bharuch) | ~450.00                 |
| Narmada (District)   | ~15.00                  |

*\*Source: District Environment Plan, MPPCB (from Narmada River Basin Infrastructure and Planning Report)*

In specific context to Narmada River basin, amount of Industrial Sewage generation varies from district to district. **Table 13** provides district wise industrial waste generation in Narmada River basin. However, the statistics shows in the table includes value of the whole district even if a particular district's small portion falls under the basin.

The table on industrial sewage generation in the Narmada River Basin reveals a highly uneven pattern of wastewater discharge, directly linked to the degree of industrialization in different districts. At the top of the scale, Narshinghpur stands out with an exceptionally high industrial sewage load of around 1006 MLD, making it by far the largest single contributor within the basin. However, this district doesn't have presence of larger industrial areas in comparison to districts like Dhar which produce only 18 MLD industrial wastewater. Similarly, Bharuch district in Gujarat, well known as one of India's leading industrial hubs, generates enormous industrial wastewater, estimated between ~450 and ~500 MLD. Together, Narshinghpur and Bharuch account for the bulk of the basin's industrial sewage, clearly identifying them as critical hotspots of industrial wastewater pollution.

Other districts contribute moderately high loads, reflecting pockets of industrial development. Betul (51.99 MLD) and Chhindwara (46.33 MLD) show significant levels of wastewater generation, largely due to their industrial estates and medium-scale industries. Khandwa (39.96

MLD) also emerges as a major contributor, while Hoshangabad (25 MLD) and Khargone and Sehore (22 MLD each) reflect steady industrial growth alongside their agricultural bases. Districts like Dhar (18.6 MLD), Balaghat (16 MLD), and Sagar (15.3 MLD) add to the medium-level range of wastewater discharge, showing a mix of localized industries such as textiles, food processing, and small manufacturing.

In contrast, a group of districts generates only limited amounts of industrial sewage, indicating better water treatment facilities or low level of industrialisation. These include Jabalpur (8 MLD), Seoni (9.5 MLD), Raisen (13.8 MLD), and Mandla (0.9 MLD). The lowest values are reported from districts such as Barwani (1 MLD), Burhanpur (1.07 MLD), Jhabua (0.72 MLD), and Harda (0.11 MLD), while Damoh, Dindori, and Alirajpur show negligible or zero industrial sewage generation, reflecting their predominantly agrarian or tribal character with minimal industrial activity. A special case is Narmada district in Gujarat, where industrial sewage is estimated at ~15 MLD, reflecting growing industrialization along the river corridor.

Thus, the data highlights the concentrated nature of industrial pollution in the basin, where a few districts such as Narshinghpur and Bharuch dominate the wastewater load, while the majority contribute relatively little. This concentration creates uneven pressure on the river system highly industrialized zones face acute challenges of wastewater treatment, effluent management, and river pollution, whereas less industrialized districts are still at a stage where preventive measures can be taken before large-scale problems emerge. The situation underlines the need for district-specific strategies: advanced treatment plants, strict monitoring, and enforcement of effluent standards in high-load districts; and proactive planning with sustainable industrial practices in emerging zones.

In lower basin Bharuch–Ankleshwar belt is the main source of industrial wastewater in the lower basin. Together, these two areas generate about 231.201 MLD of wastewater. Out of this, Ankleshwar produces about 104.414 MLD and Bharuch about 126.787 MLD. Only about 41.962 MLD of this is treated and discharged into drains or rivers, while the rest is handled through reuse or common treatment plants. In individual estates, Ankleshwar produces about 62 MLD, Panoli about 14.5 MLD, Vilayat about 2 MLD, Dahej about 50 MLD, and Jhagadia about 100 MLD. Rajpipla-II produces only 0.50 MLD. Smaller districts generate very little wastewater. Chhota Udepur generates 0.108 MLD, and all of it is treated inside the industries. Rajpipla produces 2.546 MLD, which is also managed without discharge into rivers. There are five CETPs (Common Effluent Treatment Plant) in the Bharuch-Ankleshwar area, along with

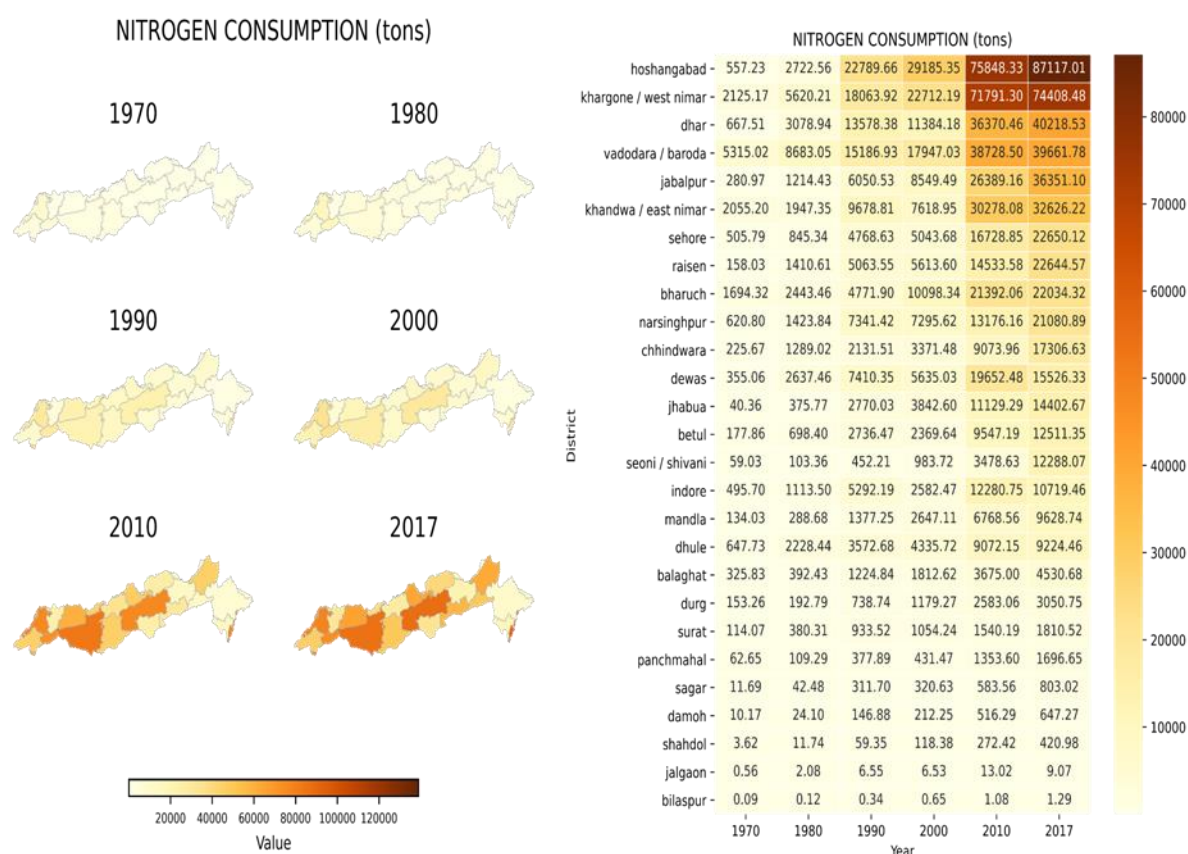
many in-house treatment units. Compliance with standards is generally high, and the Gujarat Pollution Control Board carries out inspections and monitoring.

### **3.3 Agricultural Runoff and Water Quality**

#### **3.3.1 Fertilizer and Pesticide Use Patterns**

Agriculture in the Narmada River Basin is highly intensive, with farmers cultivating crops such as wheat, rice, soybean, cotton, pulses, sugarcane, and horticultural produce. To sustain high yields, the use of chemical fertilizers (mainly urea, DAP, potash, and complex fertilizers) and pesticides has become widespread. Fertilizer consumption is particularly high in irrigated stretches of Madhya Pradesh and Gujarat, where canal irrigation and groundwater extraction support multiple cropping cycles. Along with fertilizers, pesticides, including insecticides, herbicides, and fungicides are extensively applied, especially in cash crop belts like cotton in the lower basin (Bharuch, Narmada, and adjoining regions) and soybean-growing areas in the upper and middle basin.

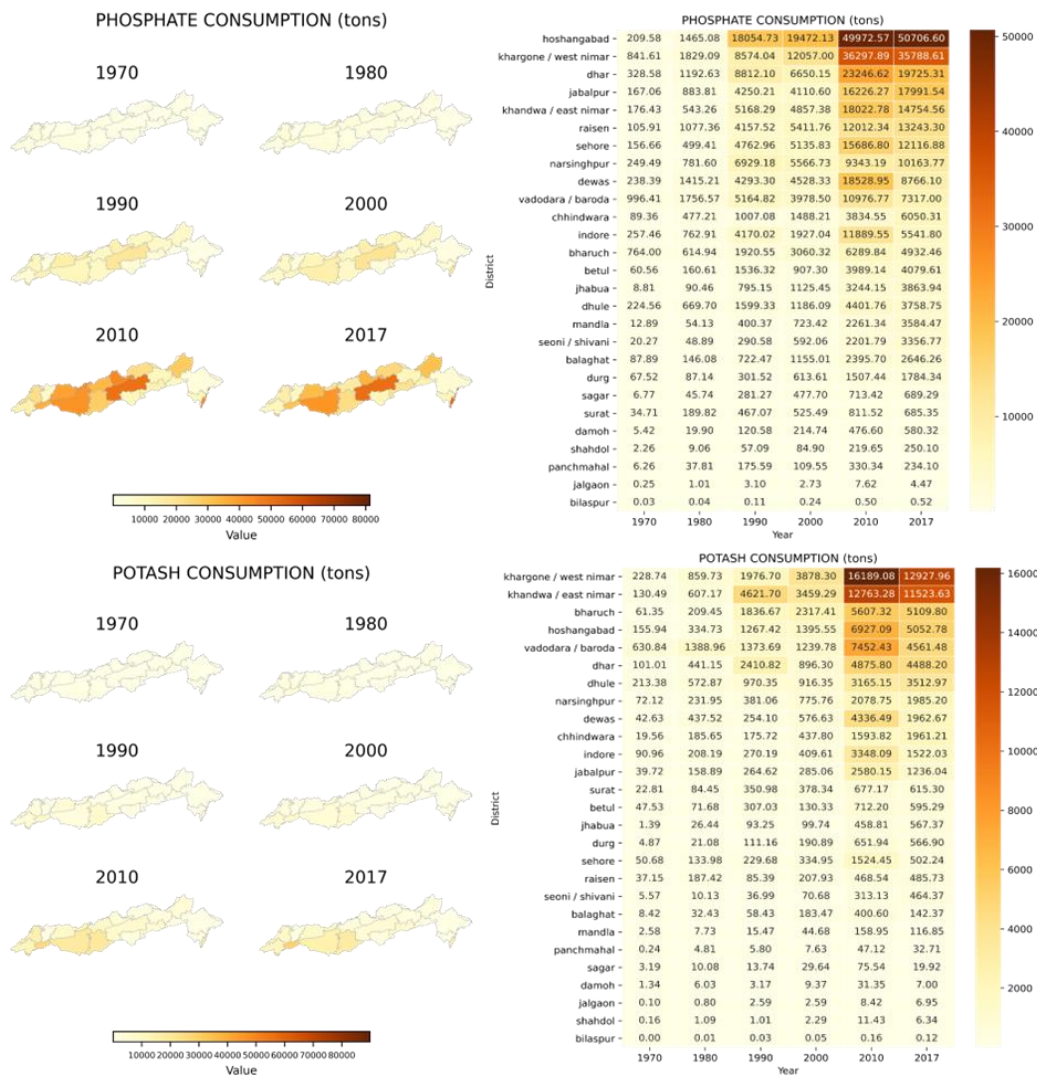
Nitrogen consumption (tons) across districts of the Narmada basin highlights sharp regional variations over time (**Fig. 6**). The highest levels are recorded in Hoshangabad (Narmadapuram), where consumption rose dramatically from 557.23 tons in 1970 to 87,117.01 tons in 2017, followed closely by Khargone/West Nimar with an increase from 2,125.17 tons to 74,408.48 tons. Other major consumption centers include Dhar and Vadodara (Baroda), which also show steep upward trends, crossing 40,000 and 39,000 tons respectively by 2017. In the mid-range, districts such as Khandwa (East Nimar), Sehore, Raisen, Narsinghpur, and Bharuch report values between 20,000 and 32,000 tons, indicating significant but comparatively moderate usage. At the lowest end, districts such as Shahdol and Bilaspur remain below 500 tons and 2 tons respectively, while others like Damoh and Sagar stay under 1,000 tons even in 2017. This contrast reflects a pattern where the central and agriculturally intensive districts of the basin have experienced sharp increases in fertilizer use, while peripheral and tribal-dominated regions continue to record minimal consumption (Since the figure shows historical fertilisers consumption, as a result, small portions of some then undivided districts—such as Durg, Bilaspur, Jalgaon, Damoh, and Panchmahal—are included in the analysis).



**Figure 6 Use of Nitrogen in Narmada River Basin**

In terms of phosphate-consumption Fig. 7 shows a pronounced increase in fertilizer use concentrated in the central Narmada belt. At the top end, Hoshangabad (Narmadapuram) rises from 209.58 tons (1970) to 50,706.60 tons (2017), and Khargone grows from 841.61 tons to 35,788.61 tons; Dhar also shows a large rise from 328.58 to 19,725.31 tons. A mid-range group includes Khandwa / East Nimar (105.91 → 13,243.30), Sehore (156.66 → 12,116.88), Raisen (249.49 → 10,163.77) and Bharuch (238.39 → 8,766.10), each reflecting substantial but lower consumption than the hotspots. At the low end are largely non-intensive or tribal/peripheral districts such as Bilaspur (0.03 → 0.52), Jalgaon (0.25 → 4.47) and Shahdol (6.26 → 234.10), which remain minimal consumers by 2017. Overall, the pattern highlights very large growth in phosphorus use in a few cores, irrigated districts (Hoshangabad, Khargone, Dhar), a broad middle band of significant users, and many fringe districts where inputs remain low.





**Figure 7 Potash and Phosphate Consumption, Narmada River Basin**

**Fig. 7** also shows the consumption of potash in the Narmada River Basin from 1970 to 2017. The largest users by 2017 are Hoshangabad, which increased from 228.74 tons in 1970 to 12,927.96 tons in 2017, and Khargone, which rose from 130.49 to 11,523.63 tons over the same period. A broad mid-range group includes Sehore (50.68 → 502 tons), Raissen (72.12 → 1,985.20 tons), and Bharuch (61.35 → 5,109 tons). Smaller but notable increases are seen in Mandla (2.28 → 117.85 tons) and Balaghat (8.42 → 142.37 tons).

In the Gujarat stretch of the Narmada basin, cotton, paddy, groundnut, and pulses are the dominant crops. These require substantial inputs of nitrogen (N), phosphorus (P), and potassium (K) fertilizers, which increases the risk of nutrient runoff into rivers during rainfall and irrigation return flows. Excess soluble nitrogen and phosphorus are readily mobilized during monsoon-induced surface runoff and subsurface flow, contributing to nutrient enrichment in the Narmada River and raising the potential for eutrophication.

Cotton cultivation in Gujarat also involves intensive insecticide and pesticide use. When applied shortly before or during heavy rains, these chemicals can be washed into the river through field runoff and drainage channels, creating pulses of agrochemical contamination.

Monitoring and estimation of pollution loads in Gujarat should consider:

- District-level crop areas and fertilizer/pesticide application rates.
- Local runoff coefficients and monsoon rainfall patterns to estimate pollutant transport.
- Timing of fertilizer and pesticide application relative to rainfall events.
- Validation using GPCB water quality data at key Narmada stations such as Bharuch, Garudeshwar, Chandod, and Zapor/NTPC.

Mitigation strategies include split-dose fertilizer application, vegetative buffer strips along drains, integrated pest management, and event-based monitoring at tributary confluences.

### 3.3.2 Seasonal Runoff Contribution

The Narmada River in Gujarat exhibits strong seasonal variability in flow and water quality, closely linked to monsoon rainfall and agricultural cycles.

#### 1. Monsoon / Kharif Season (June–September)

Nearly 80–85% of the annual river flow occurs during the southwest monsoon, coinciding with the kharif cropping season. High-intensity rainfall generates significant surface runoff, resulting in elevated river discharge. This period is characterized by:

- **Peak pollutant transport** from agricultural fields (fertilizers, pesticides), untreated sewage, and eroded sediments.
- **Sharp increases** in turbidity, total dissolved solids (TDS), nutrients (nitrate, phosphate), and biochemical oxygen demand (BOD).
- **Episodic pollutant pulses** immediately after rainfall events, making **event-based sampling** (per storm or per day) more representative than monthly averages for capturing pollutant peaks.

#### 2. Post-Monsoon / Rabi Season (October–March)

With the cessation of monsoon rainfall, river discharge gradually declines and becomes dominated by regulated reservoir releases and baseflow. Water quality during this season shows:

- **Stabilized turbidity and TDS**, with pollutant concentrations largely governed by point-source discharges (municipal wastewater, industrial effluents).
- Moderate nutrient levels from residual agricultural return flow after rabi sowing and irrigation cycles.
- Generally improved dissolved oxygen (DO) levels due to better dilution and lower organic load compared to monsoon peaks.

### 3. Summer / Pre-Monsoon Season (April–May)

This is the low-flow period of the river, marked by minimal rainfall and high evaporation losses. Key characteristics include:

- **Concentration of pollutants** (TDS, chloride, fluoride) due to reduced dilution capacity.
- **Elevated temperatures** can lead to localized drops in DO and higher biochemical activity.
- Greater vulnerability of aquatic ecosystems to even small pollutant loads because of limited flow.

Seasonal monitoring at key stations such as Garudeshwar has consistently demonstrated these patterns, underscoring the need for season-specific management interventions and **event-based monitoring during monsoon** to capture true pollutant load dynamics.

### 3.3.3 Impact on Water Quality and Environmental Risk

Water quality assessments in the Narmada Basin reveal exceedances of several critical parameters beyond WHO/IS standards. As highlighted in **Table 14**, Nitrate levels ranging from 45–90 mg/L, particularly in Omkareshwar and Bharuch, pose risks of drinking water contamination. Phosphate concentrations between 1.5–3.0 mg/L in Hoshangabad and Barwani indicate risks of eutrophication and aquatic toxicity. Pesticide residues, with 2-4 compounds detected in agricultural belts, highlight concerns over chronic human exposure and ecological stress. In addition, heavy metals such as zinc, nickel, and chromium have been found above permissible limits in river sediments across Madhya Pradesh and Gujarat, threatening aquatic ecosystems. These findings underscore the need for basin-wide pollution control and stricter water quality monitoring.

*Table 14 Impact of Agrochemical Use on Water Quality*

| Parameter                                     | Observed Level          | Permissible Limit (WHO/IS) | Risk Zone (Basin)         | Key Impacts                      |
|-----------------------------------------------|-------------------------|----------------------------|---------------------------|----------------------------------|
| Nitrate<br>(NO <sub>3</sub> <sup>-</sup> )    | 45–90 mg/L              | <45 mg/L                   | Omkareshwar, Bharuch      | Drinking water contamination     |
| Phosphate<br>(PO <sub>4</sub> <sup>3-</sup> ) | 1.5–3.0 mg/L            | <1 mg/L                    | Hoshangabad, Barwani      | Eutrophication, aquatic toxicity |
| Pesticide Residues                            | Detected compounds      | (2–4NA)                    | Agricultural belts        | Chronic exposure, health risks   |
| Heavy Metals                                  | Zn, Ni, Cr above limits | Varied                     | River sediments in MP/Guj | Aquatic ecosystem impact         |

*\*Source: CPCB Water Quality Report (2022), Singh et al. (2021)*

Water quality monitoring in Gujarat's Narmada basin (stations: Garudeshwar, Chandod, Zadeshwar/Bharuch, Zapor/NTPC) over the last decade shows:

BOD (Biochemical Oxygen Demand):

- Peaks during and after the monsoon, reflecting organic matter from agriculture and untreated or partially treated sewage.
- Ten-year data shows persistent high spikes with no significant long-term improvement.

COD (Chemical Oxygen Demand) & DO (Dissolved Oxygen):

- COD peaks often exceed BOD due to recalcitrant organics.
- Elevated COD corresponds with drops in DO, creating low-oxygen zones harmful to aquatic life.

Nutrients (Nitrogen & Phosphorus):

- Nitrate is transported in dissolved form; phosphorus is largely attached to sediment.
- Post-monsoon surges increase the risk of algal blooms.

TDS / Conductivity:

- Diluted during monsoon; increases in dry months, particularly downstream of irrigated areas or saline groundwater inflows.

Fecal Coliforms:

- Monsoon runoff carries animal and human waste, elevating coliform counts and posing public health risks.

Metals & Pesticide Residues:

- Heavy rainfall mobilizes metals and pesticides, especially near industrial zones or hazardous waste sites.
- Sediment monitoring is crucial to assess accumulation.

10-Year Summary – Gujarat Reach:

1. Monsoon-driven pollution dominates the annual cycle.
2. BOD, COD, nutrients, and coliforms consistently surge during rains.
3. Persistent high peaks indicate limited long-term improvement, pointing to the need for better fertilizer handling, erosion control, and sewage treatment.

### **3.4 Sewage and Other Pollution Sources in the Narmada River Basin, Gujarat**

#### **3.4.1 Untreated Sewage Discharges**

A significant number of towns and drains along Narmada are discharging untreated sewage directly into the river. At Amarkantak, the origin of the Narmada, drains such as Gayatri, Savitri and Batrani Nallahs carry untreated sewage, since the proposed STP of 1.2 MLD remains under construction. Dindori faces a similar situation, with Sanbara, Samsan Ghat and city domestic drains releasing untreated waste as its 3.8 MLD plant is still incomplete. In Mandla, the situation is critical at Navghat (Tanki Ghat), where a 0.5 MLD STP is not functioning and raw sewage flows into the river; at Mandla Khai Nallah, a 7.75 MLD STP is under construction, but untreated water continues to discharge. Narmadapuram, with multiple drains like Kisanpura, Bhilpura, Korighat and Rajghat, has no functional STP, and untreated sewage flows directly into the river. Likewise, Kannod and Khategaon in Dewas district, as well as Nemawar, discharge untreated sewage in absence of treatment plants. Further downstream, Barwaha's

Nurani Masjid Nallah, Sanawad's Morghadi and Atmortakka Nallahs, Mandleshwar's Sonia Nagar and Gangajha drains, Maheshwar's Kamanighat, Bus Stand and Ward No.4 drains, and Badwani's Anjad and Tirchipulliya Nallahs are all releasing untreated wastewater into the Narmada, since their STPs are either under construction or only proposed. These locations represent the most serious pollution threats, with raw sewage flowing unchecked into the lifeline river.

**Table 14** also shows that a few towns have made progress with sewage treatment but continue to discharge partially treated or untreated effluents. In Mandla's Ranrejghat, a 2 MLD plant is under construction, but sewage continues to enter the river untreated. Jabalpur, one of the largest contributors, has a mixed scenario: at Khandari Nallah in Lalpur and Tewar, STPs of 34 and 29 MLD are under construction, and about 60 MLD of sewage is only being managed through temporary bioremediation. At Shah Nallah near Gwarighat road, the small 0.55 MLD plant functions but still discharges partially into the river. Omkareshwar has four small STPs with a total capacity of 0.65 MLD that are operational, yet additional plants are under construction, and untreated sewage continues to reach Narmada. In Dhar, at Dharmapuri town, a 2 MLD treatment plant works and supplies treated water for gardening and agriculture, but the surplus treated water is ultimately discharged into the river. These examples show that partial interventions exist but are insufficient to bridge the large treatment gaps.

Apart from the wastewater discharge a few locations are treating wastewater completely and discharging in rivers or utilising for different purposes. In Jabalpur, at Moti Nallah near Gohalpur police station, a 32 MLD plant is operational, with treated water discharged into the Omti Nallah and then into the Pariyat and Hiran Rivers before meeting the Narmada. Similarly, the large Omti Nallah STP in Jabalpur treats 50 MLD, discharging treated effluents into connected rivers that ultimately join the Narmada. In Budhni, three small plants (2.2, 1.08 and 0.15 MLD) are functioning effectively, and their treated water is reused for gardening and construction, avoiding direct untreated discharge. These locations show the effectiveness of operational treatment facilities and provide a contrast to the widespread untreated discharges elsewhere

Urban centers along the Narmada River, particularly in the Bharuch-Ankleshwar region, often release untreated or partially treated sewage into the river. This contributes to elevated levels of Biochemical Oxygen Demand (BOD), nutrients like ammonia and nitrates, and coliform bacteria, adversely affecting water quality. The GPCB's Monthly Progress Report indicates a

total sewage generation of 4,003 Million Liters per Day (MLD), with an additional treatment capacity requirement of 337.56 MLD to meet the demand. Comparative analysis with nearby monitoring stations shows spikes in BOD levels, particularly during periods of heavy rainfall, indicating potential overflows or untreated discharges.

### **3.4.2 Non-Point & Industrial Pollution Sources**

**Industrial Stormwater (Ankleshwar-Jhagadia):** During unseasonal rains, several factories in the Ankleshwar-Jhagadia industrial belt have been reported to discharge chemical-laced effluents directly into the Narmada River. This practice has led to the death of thousands of fish, highlighting the severe impact of industrial stormwater runoff on aquatic life.

**Hazardous Waste Site (Jhagadia TSDF):** The Jhagadia Hazardous Waste Treatment, Storage, and Disposal Facility (TSDF) has a capacity of 1 million Metric Tons (MT). While designed to contain leachate, extreme rainfall or leaks from the facility may release pollutants such as metals or organics into nearby drains that lead to the river.

**Soil and Sediment Runoff:** Agricultural runoff, particularly during heavy rains, washes soil and associated nutrients like phosphorus and pesticides into the river. This non-point source pollution contributes to nutrient loading and potential eutrophication of the river system.

## 4. Solid Waste Management

### 4.1 Quantity of Solid Waste Generation (Urban and Rural)

Solid waste management (SWM) across the Narmada River Basin districts shows wide variation in both current and projected waste generation, reflecting differences in urbanization, population density, and industrial activities. Based on secondary data analysis, the estimated municipal solid waste (MSW) generation in 2025 ranges from as low as 3.78 TPD in Seoni to as high as 313.42 TPD in Khargone, indicating stark contrasts in waste generation potential across the basin. By 2030, districts such as Dewas (222.20 TPD), Barwani (156.34 TPD), and Sehore (157.77 TPD) are projected to show significant growth in waste generation, attributed primarily to rapid urban expansion, increasing commercial activities, and demographic growth.

Major urban centers such as Indore (7.62 TPD as per current estimates), Jabalpur (112.50 TPD in 2030), and Hoshangabad (117.64 TPD in 2030) continue to emerge as critical nodes of solid waste generation. Indore, though reporting lower values in this dataset due to partial coverage of municipal boundaries, is well recognized as a benchmark city in India for successful waste segregation and processing. Other districts like Damoh are also projected to nearly double their waste generation from 57.47 TPD in 2025 to 70.86 TPD by 2030, highlighting the urgent need for strengthening collection and treatment systems as depicted in **Table 15**.

*Table 15 Solid Waste Generation in the Narmada River Basin*

| Districts | Estimated Solid Waste Generation in 2025 (TPD) | Estimated Solid Waste Generation in 2030 (TPD) |
|-----------|------------------------------------------------|------------------------------------------------|
| Alirajpur | 39.21                                          | 42.21                                          |
| Anuppur*  | 25.98                                          | 27.34                                          |
| Balaghat  | 5.55                                           | 5.87                                           |
| Barwani   | 142.2                                          | 156.34                                         |
| Betul     | 72.83                                          | 76.75                                          |
| Burhanpur | 10.6                                           | 11.4                                           |
| Chindwara | 37.65                                          | 40.24                                          |
| Damoh     | 57.47                                          | 70.86                                          |
| Dewas     | 191.48                                         | 222.2                                          |
| Dhar      | 120.88                                         | 132.26                                         |
| Dindori   | 6.63                                           | -                                              |



|             |        |        |
|-------------|--------|--------|
| Harda       | 20     | -      |
| Hosangabad  | 110.48 | 117.64 |
| Indore      | 7.616  | -      |
| Jabalpur    | 106.1  | 112.5  |
| Jhabua      | 18.95  | 21.28  |
| Katni       | 65.49  | 70.9   |
| Khandwa     | 108.32 | -      |
| Khargone    | 313.42 | -      |
| Mandla      | 13.5   | -      |
| Narshingpur | 72.95  | 78.06  |
| Raisen      | 124    | 96.53  |
| Sagar       | 34     | 36     |
| Sehore      | 122.67 | 157.77 |
| Seoni       | 3.78   | -      |
| Umaria      | 12.51  | 14     |

\*All the data filled according to the basin Portion.

Source: District Environmental Plan for different districts by MPPCB

It is also noteworthy that rural and tribal-dominated districts such as Alirajpur (39.21 TPD in 2025, 42.21 TPD in 2030), Anuppur (25.98 to 27.34 TPD), and Jhabua (18.95 to 21.28 TPD) have relatively low waste generation but face challenges in collection efficiency and scientific disposal. On the other hand, emerging urban industrial districts such as Dewas, Khargone, Raisen, and Sehore show rapid growth trends, which may intensify stress on existing landfill and dumping sites.

Overall, the projected increase in solid waste generation across the basin calls for proactive planning in waste collection, transportation, and scientific disposal facilities. Legacy waste management and compliance with Solid Waste Management Rules (2016) will be essential to mitigate risks of leachate contamination and pollution load into the Narmada and its tributaries. For granular tehsil-level estimates, readers are referred to **Annexure Table A5**, which provides detailed tabulations to support district-level planning and policy development.

The Lower Narmada Basin within Gujarat comprises a mix of large urban centers, medium-sized industrial towns, and small urban settlements distributed across the districts of **Surat, Bharuch, Dahod, Narmada, Panchmahal, Vadodara, and Chhota Udepur**(Table 16).

Together, these regions represent the terminal segment of the Narmada River basin, discharging into the Gulf of Khambhat. The population density and degree of urbanization vary widely, resulting in diverse waste generation characteristics.

According to the **Gujarat Pollution Control Board (GPCB)** and **Central Pollution Control Board (CPCB)**, the state as a whole generates approximately **9,800–10,800 tonnes of municipal solid waste per day (TPD)** (GPCB, Monthly Progress Reports 2023–24). Within this total, the lower basin districts contribute a significant fraction due to the presence of major urban centers such as Surat and Vadodara, as well as growing towns like Bharuch, Dahod, and Rajpipla in the Narmada district.

### **Surat District**

Surat is Gujarat's largest generator of municipal solid waste and one of India's most advanced cities in terms of waste management systems. As per data published by the **Surat Municipal Corporation (SMC)**, the city generates approximately **2,000–2,200 TPD** of solid waste. The SMC manages door-to-door collection across all wards, using a fully mechanized fleet of compactors and transfer stations.

Over the last two years (Nov 2022–Jan 2024), the generation rate has shown a moderate increase of around **5–8%**, corresponding to urban population growth, higher per-capita waste generation, and improved waste collection efficiency. Surat operates large-scale processing facilities for segregation, composting, RDF preparation, and waste-to-energy projects under its Smart City initiatives.

#### **Key features:**

- Generation: ~2,000–2,200 TPD (SMC data, GPCB consolidated reports)
- Collection efficiency: ~100% (door-to-door coverage)
- Processing: 100% of collected waste through RDF, composting, and WtE routes
- Source: SMC Solid Waste Management Department, GPCB MPR 2023

### **Vadodara District**

The **Vadodara Municipal Corporation (VMC)** is another major generator of waste in the lower Narmada region. As per VMC's solid waste management department reports, the city produces about **700–750 TPD** of municipal solid waste. Approximately 98% of waste is collected daily, supported by mechanized transfer and compactor vehicles.

Vadodara's waste consists largely of biodegradable materials (about 55–60%) and recyclables (25–30%), with the remainder being inert materials. Decentralized composting and biomethanation plants handle a portion of the biodegradable fraction.

**Key features:**

- Generation: ~700–750 TPD (VMC data)
- Collection efficiency: ~98%
- Processing: Composting and small biomethanation units; dry waste handled through MRFs
- Source: VMC Solid Waste Management Approach Report, 2024; GPCB PRS, 2023

**Bharuch District**

Bharuch, located on the Narmada River's lower reach, serves as an industrial and commercial hub with substantial municipal and industrial waste generation. The city's municipal solid waste generation is estimated at **80–120 TPD**, based on population size, industrial activity, and CPCB per-capita benchmarks. The **Bharuch Nagarpalika** has initiated door-to-door collection in all wards, though segregation at source remains partial.

Legacy waste at the old dumpsite is being addressed through biomining under the guidance of the GPCB. Plans are in progress to establish a **sanitary landfill and composting facility** under a public-private partnership (PPP) model.

**Key features:**

- Generation: ~80–120 TPD (estimated from CPCB benchmark and GPCB ULB category)
- Collection: >90% door-to-door coverage

- Processing: Ongoing composting pilot and planned RDF/WtE project under PPP
- Source: GPCB MPR 2023; CPCB State Inventory; Bharuch Nagarpalika DPR extracts

### **Dahod District**

Dahod district is characterized by smaller urban bodies and semi-urban settlements. According to GPCB's monitoring records and district updates, Dahod's urban local bodies together generate approximately **50–70 TPD** of solid waste. Waste collection systems have been strengthened under the Swachh Bharat Mission, but complete segregation and treatment facilities are still under development.

The district has faced issues of **open dumping and legacy waste fires** at older sites (e.g., Devgadhi Baria), indicating the need for proper remediation and engineered disposal infrastructure.

#### **Key features:**

- Generation: ~50–70 TPD (estimated from CPCB benchmark and ULB records)
- Collection efficiency: ~85–90%
- Processing: Limited composting; no large-scale WtE facilities
- Source: GPCB Monthly Progress Reports, 2023; CPCB Urban Solid Waste Inventory

### **Narmada District (Rajpipla and Surrounding Towns)**

The **Narmada district**, with **Rajpipla** as its headquarters, contributes a smaller yet important portion of the basin's total waste load. The municipal area and surrounding villages together generate roughly **20–30 TPD** of solid waste. Waste management operations are managed by the Rajpipla Nagar Palika, with support from district and state programs.

The majority of collected waste is disposed of at designated dump sites, with recent efforts underway to introduce small-scale composting and segregation at source. Legacy waste identification and biomining DPRs have been prepared under the supervision of GPCB.

**Key features:**

- Generation: ~20–30 TPD (Rajpipla and nearby GPs)
- Collection: Partial D2D coverage; manual collection in smaller wards
- Processing: Small composting pits; planned MRF development
- Source: GPCB River Basin Report, 2023; CPCB data portal

**Panchmahal District**

The **Panchmahal district**, including major urban centers such as Godhra and Halol, contributes an estimated **90–120 TPD** of municipal solid waste. Rapid urbanization and industrialization in Halol and nearby areas have increased per-capita waste generation. However, smaller municipalities and nagar panchayats within the district still rely on traditional collection systems and open dumping.

The district has been part of GPCB's pilot initiatives for improved segregation and dry waste collection. Composting units have been set up in select wards through municipal and community partnerships.

**Key features:**

- Generation: ~90–120 TPD (estimated; CPCB benchmarks)
- Collection efficiency: 85–95% in major towns
- Processing: Limited composting; dry waste handled through manual sorting units
- Source: GPCB Annual Status Reports, 2023; CPCB National Inventory

**Chhota Udepur District**

Chhota Udepur represents the smallest waste-generating district within the Lower Narmada Basin. The district headquarters town produces approximately **15–25 TPD** of solid waste, primarily biodegradable in nature. Most waste is collected manually by the Nagar Palika and deposited at open dumps on the outskirts of the town.

The district's current focus is on setting up small decentralized composting units and improving segregation at source. GPCB has advised the district to identify land for a sanitary landfill and develop a micro-level solid waste management plan under the Swachh Bharat Mission (Urban).

**Key features:**

- Generation: ~15–25 TPD (estimated from CPCB per-capita norms)
- Collection: Partial coverage (70–80%)
- Processing: Small community compost pits; minimal dry waste recovery
- Source: GPCB Monthly Compliance Report, 2023; CPCB Solid Waste Inventory

*Table 16 Summary of Waste Generation in Lower Narmada Basin (Gujarat)*

| <b>District<br/>Major ULB</b> | <b>Estimated Waste<br/>Generation (TPD)</b> | <b>Key Features</b>                                         |
|-------------------------------|---------------------------------------------|-------------------------------------------------------------|
| Surat                         | 2,000–2,200                                 | Fully mechanized, 100% collection, WtE & RDF operational    |
| Vadodara                      | 700–750                                     | Mechanized collection, composting and biomethanation in use |
| Bharuch                       | 80–120                                      | Industrial town, composting & PPP landfill proposed         |
| Dahod                         | 50–70                                       | Smaller towns, partial segregation, legacy dump remediation |
| Narmada                       | 20–30                                       | Basic collection, composting planned                        |
| Panchmahal                    | 90–120                                      | Semi-urban, expanding collection & composting               |
| Chhota Udepur                 | 15–25                                       | Small town, partial coverage, decentralized composting      |

\*All the data filled according to the basin Portion. Source: District Environmental Plan for different districts by GPCB

## **Total Estimated Waste Generation in Lower Narmada Basin (Gujarat): ~3,000–3,300 TPD**

- The **urban centers of Surat and Vadodara** dominate total waste generation, together accounting for nearly 85% of the basin’s waste load.
- Smaller districts such as **Narmada and Chhota Udepur** generate modest amounts but lack adequate processing infrastructure, requiring focused attention on decentralized solutions.
- **Bharuch and Panchmahal** represent growing industrial-urban regions where waste management systems are still evolving.
- **Dahod** requires urgent remediation of legacy sites and establishment of sanitary disposal facilities to prevent contamination of nearby water bodies.
- Continuous updating of ULB-level data through **GPCB’s Monthly Progress Reports** and **CPCB’s Swachh Bharat Mission dashboard** is essential to track trends between 2022 and 2024 and beyond.

### **4.1.1 Solid Waste Generation and Processing Status in Narmada River Basin Districts (Nov 2022 vs. Jan 2024)**

**Table 17** presents a comparative account of municipal solid waste generation, processing, and the corresponding processing gaps for districts falling under the Narmada River Basin. Data has been compiled for two reference periods – November 2022 and January 2024 – based on the Swachh Bharat Mission MIS (2022–23).

Key highlights:

- **Overall Improvement:** Most districts have shown significant progress in reducing the processing gap between 2022 and 2024.
- **High-Generation Districts:** Bhopal, Indore, and Jabalpur continue to be the largest waste generators, each exceeding 500 TPD, while smaller districts such as Dindori and Harda generate below 30 TPD.
- **Gap Reduction:** Districts like Sagar, Anuppur, Raisen, and Khandwa demonstrated

noticeable reduction in processing gaps, reflecting improved waste management efficiency.

- **Zero Gap Achievements:** By January 2024, most districts (e.g., Indore, Bhopal, Jabalpur, Katni, Dhar, Burhanpur, Mandla, Seoni, etc.) achieved near complete or complete processing, ensuring no backlog of unprocessed waste.
- **Sustained Performance:** Districts such as Alirajpur, Dewas, Khargone, Narsimhapur, and Chhindwara already had minimal or no processing gaps in 2022 and sustained this efficiency through 2024.

*Table 17 Status of solid waste management district-wise*

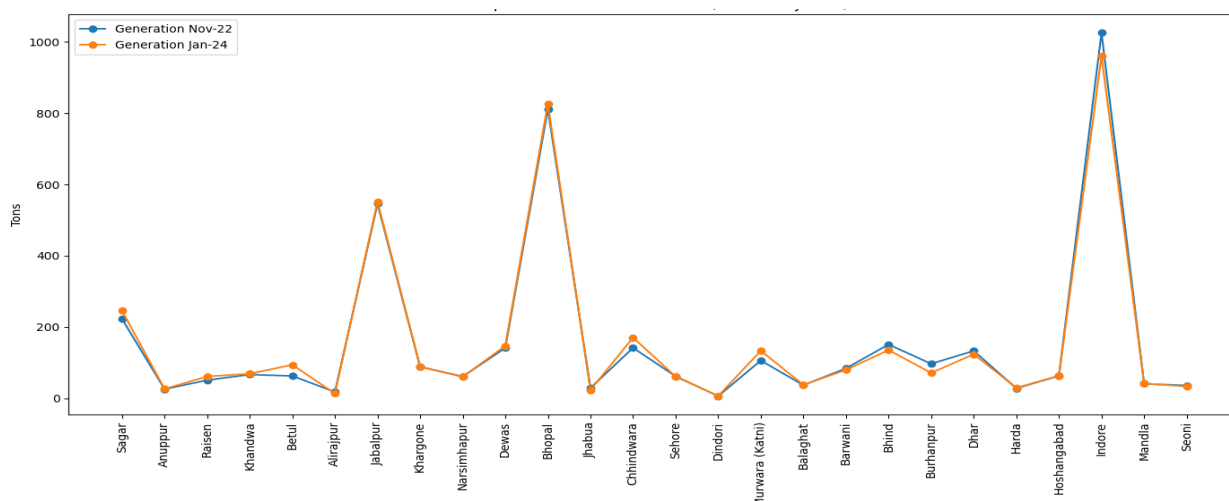
| Sr. N. | District Name   | Nov-22            |                   |                | District        | Jan-24            |                   |                |
|--------|-----------------|-------------------|-------------------|----------------|-----------------|-------------------|-------------------|----------------|
|        |                 | Generation (Tons) | Processing (Tons) | Processing Gap |                 | Generation (Tons) | Processing (Tons) | Processing Gap |
| 1      | Sagar           | 223.02            | 206.73            | 16.29          | Sagar           | 245.97            | 233.49            | 12.48          |
| 2      | Anuppur         | 25.5              | 14.99             | 10.51          | Anuppur         | 26.21             | 18.39             | 7.83           |
| 3      | Raisen          | 50.81             | 45.83             | 4.98           | Raisen          | 61.07             | 56.53             | 4.54           |
| 4      | Khandwa         | 66.4              | 62.1              | 4.3            | Khandwa         | 68.77             | 64.85             | 3.92           |
| 5      | Betul           | 62.61             | 61.13             | 1.48           | Betul           | 93.92             | 91.66             | 2.27           |
| 6      | Alirajpur       | 17.67             | 17.67             | 0              | Alirajpur       | 13.32             | 13.16             | 0.15           |
| 7      | Jabalpur        | 545.88            | 545.88            | 0              | Jabalpur        | 551.85            | 551.75            | 0.1            |
| 8      | Khargone        | 88.48             | 88.48             | 0              | Khargone        | 88.59             | 88.52             | 0.07           |
| 9      | Narsimhapur     | 60.9              | 60.74             | 0.15           | Narsimhapur     | 60.02             | 59.96             | 0.06           |
| 10     | Dewas           | 141.06            | 140.87            | 0.19           | Dewas           | 146.91            | 146.86            | 0.05           |
| 11     | Bhopal          | 811.72            | 811.72            | 0              | Bhopal          | 826.65            | 826.61            | 0.04           |
| 12     | Jhabua          | 28.7              | 28.7              | 0              | Jhabua          | 23.17             | 23.14             | 0.03           |
| 13     | Chhindwara      | 141.52            | 141.52            | 0              | Chhindwara      | 170.32            | 170.31            | 0.01           |
| 14     | Sehore          | 61.65             | 60.81             | 0.84           | Sehore          | 60.87             | 60.87             | 0              |
| 15     | Dindori         | 6.06              | 6.06              | 0              | Dindori         | 6.44              | 6.44              | 0              |
| 16     | Murwara (Katni) | 105.88            | 105.88            | 0              | Murwara (Katni) | 133.23            | 133.23            | 0              |



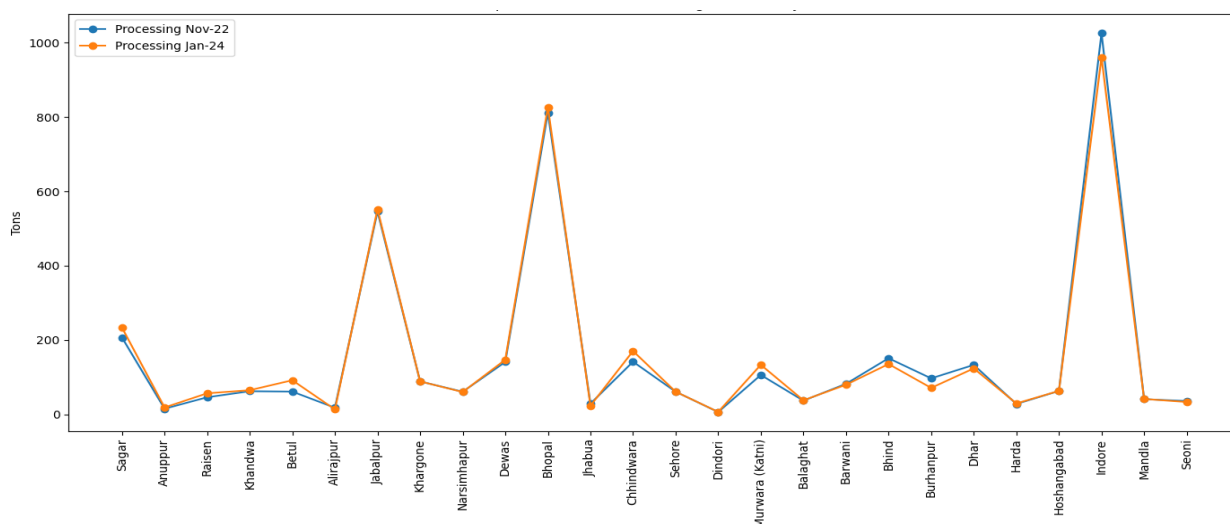
|    |          |         |         |      |          |        |        |   |
|----|----------|---------|---------|------|----------|--------|--------|---|
| 17 | Balaghat | 36.72   | 36.72   | 0    | Balaghat | 37.68  | 37.68  | 0 |
| 18 | Barwani  | 83.86   | 82      | 1.86 | Barwani  | 79.51  | 79.51  | 0 |
| 19 | Bhind    | 150.9   | 150.9   | 0    | Bhind    | 135.32 | 135.32 | 0 |
| 20 | Burhanp  | 96.74   | 96.74   | 0    | Burhanp  | 71.08  | 71.08  | 0 |
|    | ur       |         |         |      | ur       |        |        |   |
| 21 | Dhar     | 132.96  | 132.96  | 0    | Dhar     | 123.49 | 123.49 | 0 |
| 22 | Harda    | 27.83   | 27.83   | 0    | Harda    | 29.24  | 29.24  | 0 |
| 23 | Hoshang  | 62.79   | 62.79   | 0    | Hoshang  | 62.96  | 62.96  | 0 |
|    | abad     |         |         |      | abad     |        |        |   |
| 24 | Indore   | 1025.89 | 1025.89 | 0    | Indore   | 960.58 | 960.58 | 0 |
| 25 | Mandla   | 40.71   | 40.71   | 0    | Mandla   | 41.28  | 41.28  | 0 |
| 26 | Seoni    | 35.78   | 35.78   | 0    | Seoni    | 33.11  | 33.11  | 0 |

*\*Source: Presentation cum Compliance by Govt. of Madhya Pradesh in OA No. 606 of 2018 (Compliance of MSW Management Rules, 2016), National Green Tribunal, September 2025*

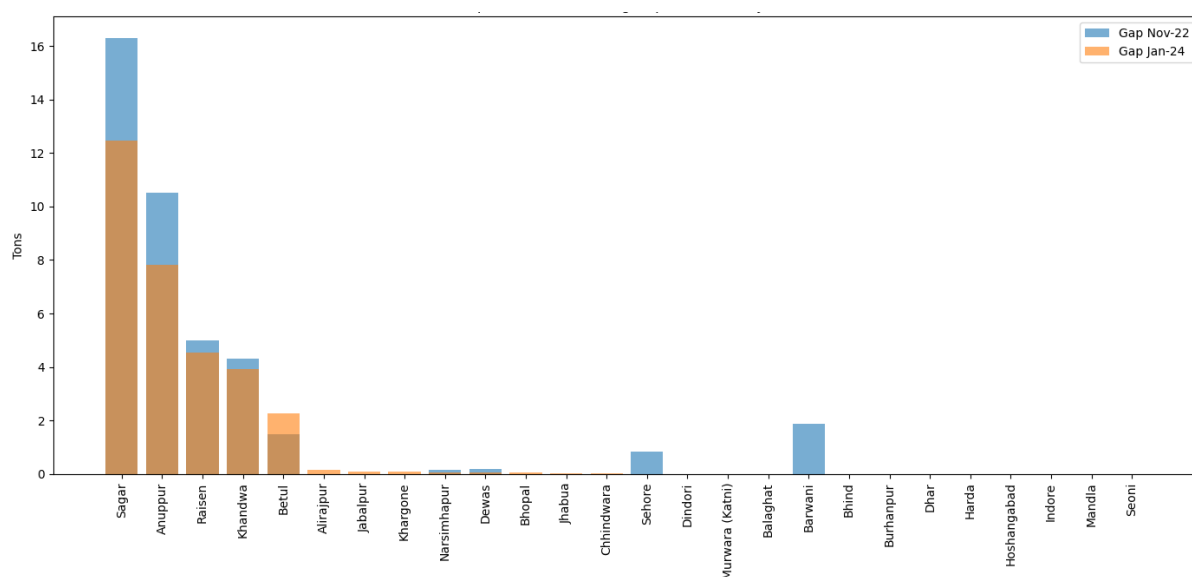
This progress highlights the effectiveness of localized solid waste management systems across the Narmada Basin and underscores the growing emphasis on scientific processing, segregation, and treatment of waste. **Garph. 109, 110 and 111** shows the comparative analysis of waste generation. The near elimination of processing gaps indicates substantial movement towards compliance with the Solid Waste Management Rules, 2016, and supports improved environmental health of the Narmada River Basin.



**Graph 109 Comparison of Waste Generation (Nov 22 vs Jan 24)**



*Graph 110 Comparison of Waste Processing (Nov 22 vs Jan 24)*



*Graph 111 Comparison of Processing Gap (Nov 22 vs Jan 24)*

To assess the recent trend of municipal solid-waste generation in the **Lower Narmada Basin (Gujarat)**, comparative estimates have been compiled for **November 2022** and **January 2024** using data from the **Gujarat Pollution Control Board (GPCB)**, **Central Pollution Control Board (CPCB)**, and available municipal-corporation sources (Surat Municipal Corporation and Vadodara Municipal Corporation). Where district-wise quantities were not published on GPCB/CPCB public dashboards, **CPCB per-capita generation benchmarks** (0.45–0.5 kg/person/day for municipal areas) and ULB classification have been used to derive conservative estimates.

Between November 2022 and January 2024, waste generation in most Lower-Basin districts has shown a **modest but consistent increase (4–8%)**, reflecting urban growth, improved collection coverage, and more accurate reporting by ULBs. Surat and Vadodara remain the two dominant contributors—together accounting for nearly **85 %** of the Basin’s total municipal solid waste given in **table 18**.

*Table 18 Solid Waste Generation Comparison (Nov 2022 vs Jan 2024) for Lower Narmada Basin Districts, Gujarat.*

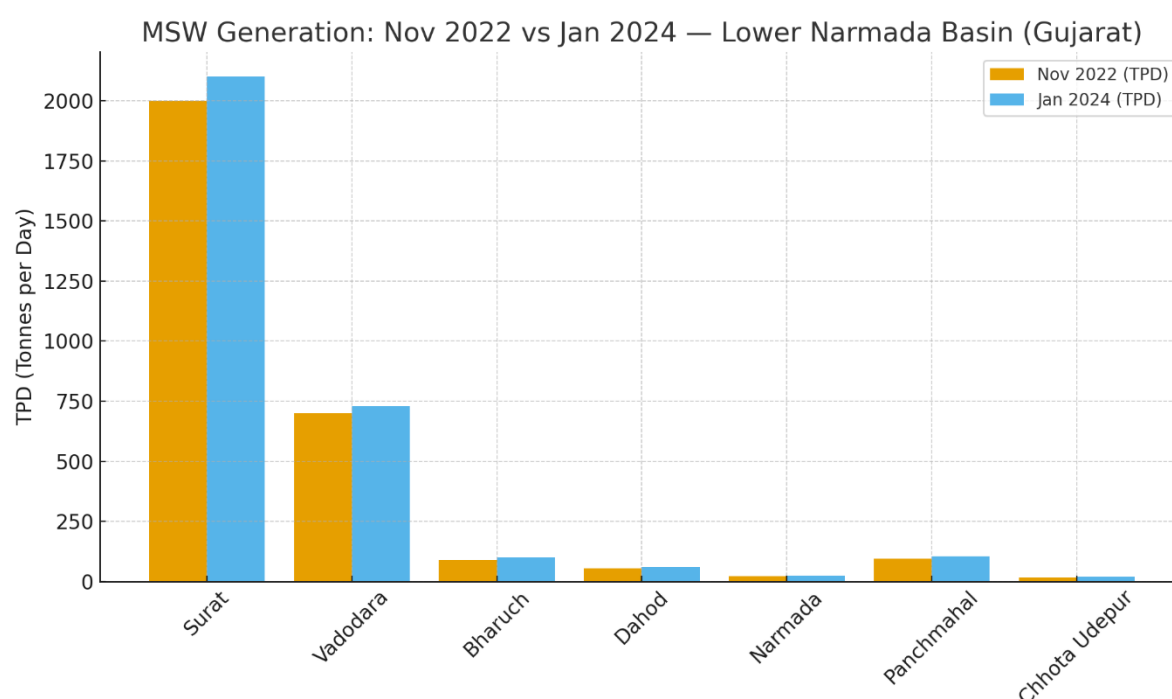
| District / ULB | Nov 2022 (TPD) | Jan 2024 (TPD) | Change (TPD) | % Change | Remarks / Source                                |
|----------------|----------------|----------------|--------------|----------|-------------------------------------------------|
| Surat          | 2,000          | 2,100          | +100         | +5.0 %   | Reported by SMC & GPCB MPR (2023-24)            |
| Vadodara       | 700            | 730            | +30          | +4.3 %   | VMC Dept. Reports & GPCB State Data             |
| Bharuch        | 90             | 100            | +10          | +11.1 %  | Estimated (CPCB benchmark + ULB inputs)         |
| Dahod          | 55             | 60             | +5           | +9.1 %   | Estimated (CPCB benchmark; GPCB district notes) |
| Narmada        | 22             | 25             | +3           | +13.6 %  | Estimated (ULB data / GPCB River Basin Report)  |
| Panchmahal     | 95             | 105            | +10          | +10.5 %  | Estimated (CPCB benchmark; ULB aggregates)      |
| Chhota Udepur  | 17             | 20             | +3           | +17.6 %  | Estimated (ULB inputs / GPCB 2023 MPR)          |

*\*(Sources: GPCB Monthly Progress Reports 2023-24; CPCB SWM Annual Report 2023; SMC & VMC ULB data; CPCB per-capita estimates for other districts.)*

### District-wise Interpretation

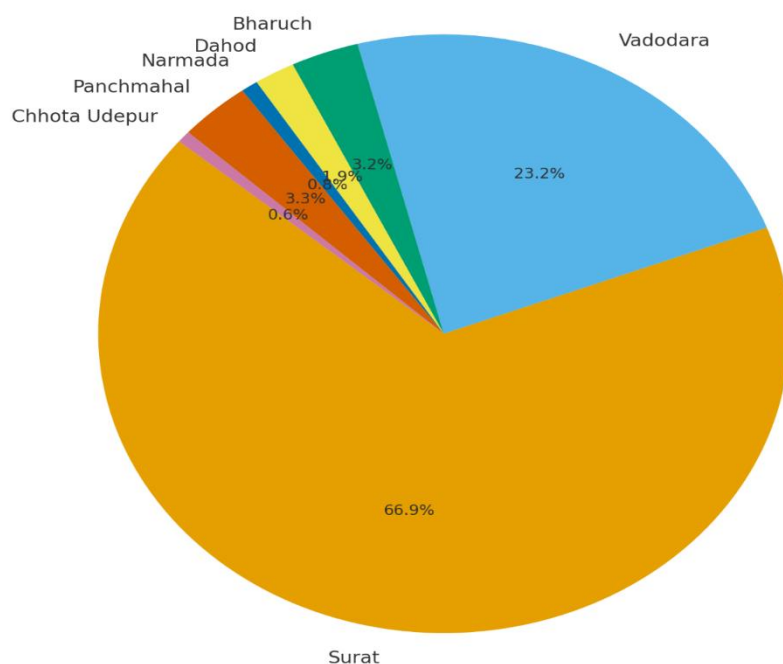
- **Surat:** Generation increased from ~2,000 TPD to ~2,100 TPD due to expansion of collection coverage and population growth. SMC’s mechanized system processes nearly 100 % of waste through composting, RDF and WtE facilities.

- **Vadodara:** Waste increased slightly (700 → 730 TPD), indicating stabilized generation with efficient collection. Composting and biomethanation plants are operational.
- **Bharuch:** A moderate rise (90 → 100 TPD) aligns with industrial growth and higher service coverage; a PPP sanitary landfill is under planning.
- **Dahod:** Incremental increase (55 → 60 TPD) attributed to improved reporting under Swachh Bharat Mission; processing facilities remain minimal.
- **Narmada (Rajpipla):** Small rise from 22 to 25 TPD; community-level composting and biomining proposals are under implementation.
- **Panchmahal:** Generation rose from 95 to 105 TPD following urban expansion in Godhra and Halol. Local composting and segregation programmes are being introduced.
- **Chhota Udepur:** Lowest absolute increase (17 → 20 TPD), yet highest percentage growth (≈18 %) due to improved door-to-door coverage and new municipal wards.



**Graph 112 MSW Generation Comparison (Nov 2022 vs Jan 2024) — Lower Narmada Basin Districts**  
 \*(Source: GPCB MPR 2023-24; CPCB benchmarks; ULB data)

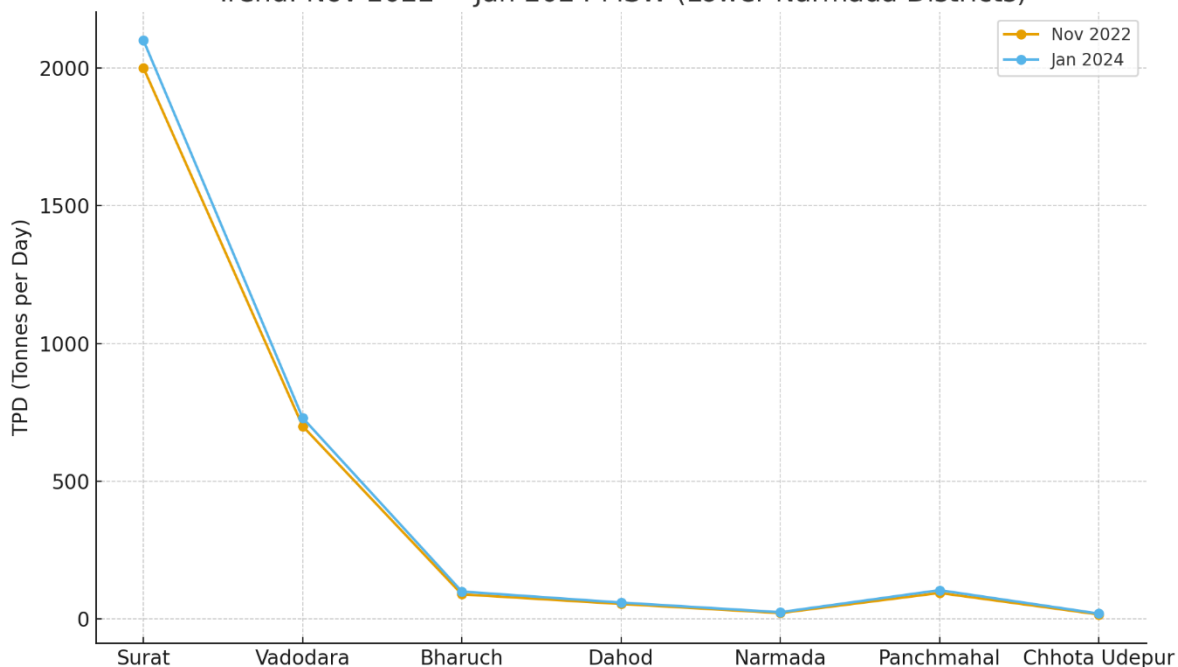
Share of MSW Generation by District — Jan 2024 (TPD)



**Graph 113 Share of MSW Generation by District — Jan 2024**

\*Source: Compiled from GPCB MPR 2023-24 and ULB records

Trend: Nov 2022 → Jan 2024 MSW (Lower Narmada Districts)



**Graph 114 Trend of MSW Generation (Nov 2022 → Jan 2024) — Lower Narmada Basin**

\*Source: GPCB MPR 2023-24; CPCB SWM Report 2023

- **Overall Increase:** Total MSW generation in the Lower Narmada Basin increased from approximately **2,980 TPD in Nov 2022 to 3,140 TPD in Jan 2024** ( $\approx 5.4\%$  growth).
- **Dominant Cities:** Surat and Vadodara jointly contribute over **83 %** of the total basin waste, requiring sustained capacity for RDF and WtE operations.
- **Emerging Clusters:** Bharuch and Panchmahal are expanding industrial-urban centres with rising waste generation; they need cluster-level integrated facilities.
- **Smaller ULBs:** Narmada and Chhota Udepur have low absolute quantities but higher relative growth; decentralized composting and segregation should be prioritized.
- **Legacy Sites:** Dahod and Bharuch still rely partly on open dumping; remediation and sanitary-landfill development remain critical.

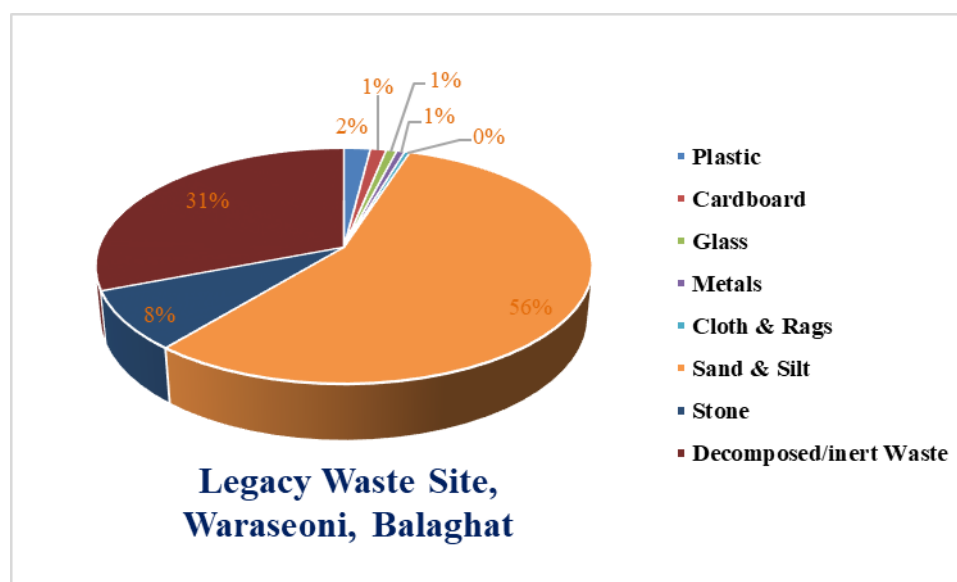
Between 2022 and 2024, Lower Narmada Basin districts recorded steady increases in municipal solid-waste generation. The trend underscores the urgency of scaling up processing infrastructure—particularly composting, MRFs, and RDF/WtE facilities—to maintain compliance with the **Solid Waste Management Rules, 2016**. Continuous monitoring through **GPCB Monthly Progress Reports** and **CPCB state inventories** will be vital for accurate trend assessment and basin-level planning.

## 4.2 Composition of Solid Waste

The composition of municipal solid waste (MSW) in the Narmada River Basin varies widely across urban local bodies (ULBs), reflecting differences in urbanization, industrial activity, consumption patterns, and the age of dumpsites. Due to limited availability of systematic datasets, composition analysis could be carried out for only four ULB sites Waraseoni (Balaghat), Pithampur (Dhar), Mandideep (Raisen), and Thandla (Jhabua). These datasets, though not fully uniform, provide a representative snapshot of the waste profile in different contexts: legacy sites dominated by inert and decomposed fractions, active dumpsites with a balanced mix of biodegradable and recyclable materials, and small-town sites with extremely high plastic and RDF fractions. Together, these results highlight the heterogeneity of solid waste streams across the basin and emphasize the need for site-specific waste management strategies including bio-mining, segregation at source, material recovery facilities (MRFs), and plastic waste channelization.

At the legacy waste site in Waraseoni (Balaghat district), the composition analysis reveals a predominance of sand and silt (56%) and decomposed/inert fractions (30.86%), which together account for nearly 87% of the total waste. This highlights the aged nature of the dumpsite, where active biodegradable fractions have already decomposed, leaving behind soil-like material and inert mass. Among the minor fractions, stone (8.14%) is notable, while plastic (2%), cardboard (1.2%), glass (0.8%), metals (0.6%), and cloth and rags (0.4%) constitute only a small share.

Overall, the waste profile at Waraseoni indicates a legacy-dominated dump with minimal recyclable or high-value fractions, underscoring the importance of bio-mining and safe disposal of the inert load to reduce long-term environmental impact.



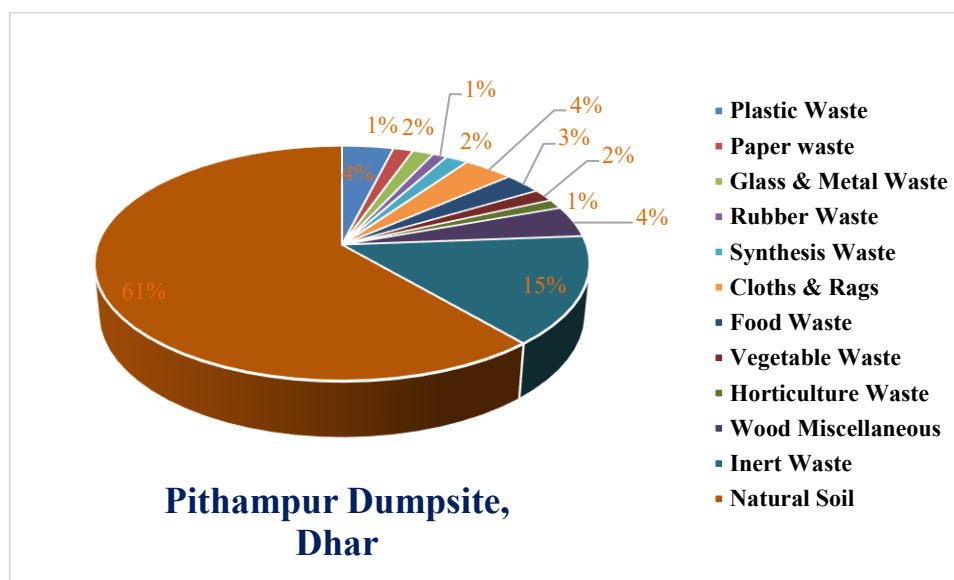
**Figure 8 Legacy waste site in Waraseoni solid waste composition**

*\*Source: Government of Madhya Pradesh. (2024). Action taken report in OA No. 606 of 2018 (Compliance of MSW Management Rules, 2016 and other environmental issues). National Green Tribunal*

The Pithampur dumpsite in Dhar district presents a mixed waste profile with natural soil (61.3%) and inert waste (14.9%) together accounting for more than three-fourths of the total composition. This indicates a significant proportion of non-recoverable fractions typical of open dumpsites. Among the recoverable materials, wood and miscellaneous waste (4.3%), cloths and rags (3.8%), and plastic waste (3.9%) form the largest components, suggesting moderate recycling potential. Smaller but notable fractions include paper (1.5%), glass and

metals (1.6%), synthesis waste (1.7%), food waste (2.9%), vegetable waste (1.7%), horticulture waste (1.3%), and rubber waste (1.1%).

Overall, the Pithampur composition reflects an active waste stream with a balance of inert and recyclable fractions, highlighting the need for segregation at source, material recovery facilities (MRFs), and controlled processing to reduce the burden on dumping grounds.



**Figure 9 Pithampur dumpsite Dhar Solid waste composition**

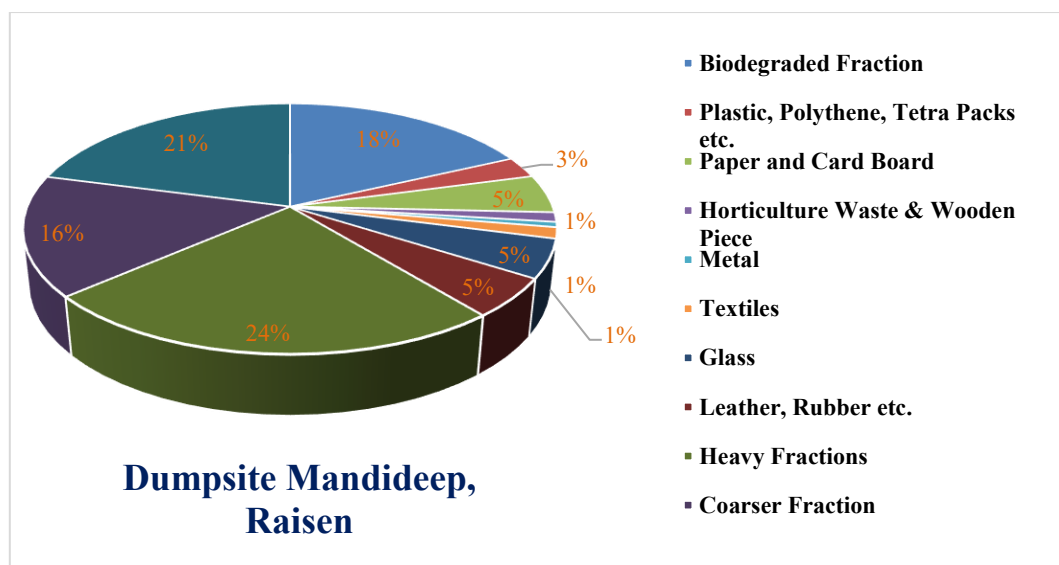
*\*Source: Government of Madhya Pradesh. (2024). Action taken report in OA No. 606 of 2018 (Compliance of MSW Management Rules, 2016 and other environmental issues). National Green Tribunal*

At the Mandideep dumpsite located behind HEG Industries in Raisen district, the composition analysis shows a relatively balanced distribution between biodegradable, recyclable, and inert fractions. Heavy fractions (24.50%), fine fractions (20.88%), and coarser fractions (15.54%) together dominate the profile, accounting for over 60% of the waste mass. These components represent the bulkier and degraded material typically found in industrial-adjacent dumpsites.

Biodegradable content is still significant, with biodegraded fractions (18.02%) highlighting ongoing organic degradation processes. Among recyclables, paper and cardboard (4.96%), glass (4.96%), and plastics/polythene/tetra packs (2.76%) are the main contributors. Smaller shares include horticulture and wood waste (1.24%), metals (0.67%), textiles (1.43%), and leather/rubber waste (5.05%), which collectively reflect the heterogeneous nature of municipal and industrial solid waste.



The results indicate that Mandideep’s dumpsite contains both recoverable fractions and a high load of inert and heavy materials, making it suitable for interventions such as bio-mining coupled with resource recovery to reduce landfill pressure.

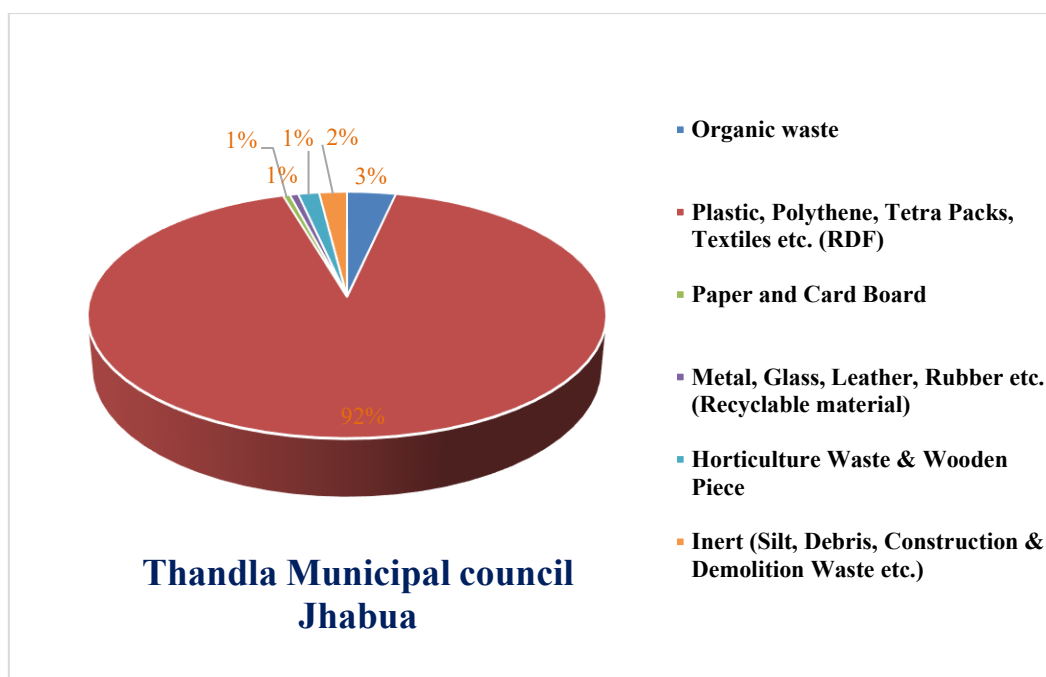


**Figure 10 Mandideep dumpsite Raisen solid waste composition**

*\*Source: Government of Madhya Pradesh. (2024). Action taken report in OA No. 606 of 2018 (Compliance of MSW Management Rules, 2016 and other environmental issues). National Green Tribunal.*

The Thandla municipal council dumpsite in Jhabua district is overwhelmingly dominated by plastic, polythene, tetra packs, and textiles (92%), which together form the bulk of the waste stream. This extremely high proportion of refuse-derived fuel (RDF) material highlights growing dependence on plastic and synthetic packaging, even in smaller towns. Minor fractions include organic waste (3.5%), horticulture and wooden waste (1.5%), and inert material such as silt and debris (2%), while paper/cardboard (0.5%) and recyclable metals, glass, leather, and rubber (0.6%) are almost negligible.

The composition at Thandla reflects a plastic-heavy waste stream with very limited biodegradable or recyclable fractions, posing challenges for sustainable management. This underscores the urgent need for plastic waste segregation, RDF channelization to cement kilns or WtE plants, and awareness programs to reduce uncontrolled disposal.



**Figure 11 Thandla municipal council dumpsite Jhabua, solid waste composition.**

Source: Government of Madhya Pradesh. (2024). Action taken report in OA No. 606 of 2018 (Compliance of MSW Management Rules, 2016 and other environmental issues). National Green Tribunal.

The composition of municipal solid waste (MSW) in the **Lower Narmada Basin districts**—namely **Surat, Vadodara, Bharuch, Dahod, Narmada, Panchmahal, and Chhota Udepur**—reflects a mixture of residential, commercial, and institutional activities, varying with levels of urbanization and industrialization. Data and estimates have been compiled from **GPCB Monthly Progress Reports (2023–24)**, **CPCB Solid Waste Management Report (2023)**, and individual ULB reports (Surat and Vadodara).

*Across Gujarat's ULBs, the waste stream typically consists of:*

**Table 19 Indicative composition of municipal solid waste in Lower Narmada Basin districts, Gujarat.**

| <b>Component</b>                 | <b>Typical Share<br/>(% by weight)</b> | <b>Source / Remarks</b>                                                                                  |
|----------------------------------|----------------------------------------|----------------------------------------------------------------------------------------------------------|
| <b>Biodegradable (Wet waste)</b> | 45 – 60 %                              | Kitchen, vegetable, fruit and garden waste. Dominant in Surat & Vadodara due to dense residential zones. |

| <i>Component</i>                          | <i>Typical Share<br/>(% by weight)</i> | <i>Source / Remarks</i>                                                                                                    |
|-------------------------------------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| <b>Dry Recyclables</b>                    | 25 – 35 %                              | <i>Paper, plastics, metals, and glass; proportion higher in industrial / commercial towns like Bharuch and Panchmahal.</i> |
| <b>Inert &amp;<br/>Construction Waste</b> | 10 – 20 %                              | <i>Soil, dust, debris; relatively high near road projects and urban expansion areas.</i>                                   |
| <b>Domestic<br/>Hazardous Waste</b>       | < 3 %                                  | <i>Batteries, sanitary waste, small e-waste fractions; handled separately by ULBs and informal collectors.</i>             |

*\*(Sources: GPCB MPR 2023–24; CPCB SWM Annual Report 2023; Surat Municipal Corporation & Vadodara Municipal Corporation SWM Departments.)*

#### **Surat:**

Being a major urban and industrial hub, Surat’s waste stream contains roughly **50 % biodegradable**, **30 % dry recyclables**, and **20 % inert materials**. Markets and food establishments contribute large volumes of wet waste suitable for composting / biomethanation. SMC operates source segregation and RDF-feedstock preparation units.

#### **Vadodara:**

VMC reports a biodegradable share of **55–60 %**, supported by green-waste collection from gardens and households. Dry waste averages **30 %**, mainly paper, plastics, and packaging from residential colonies. Composting and small biomethanation plants handle segregated organic waste.

#### **Bharuch:**

As an industrial and trade-center district, Bharuch’s municipal waste shows higher **dry-fraction content (~35 %)** due to packaging and industrial canteen waste. Wet waste still accounts for nearly **50 %**, while **inerts (15 %)** arise from ongoing infrastructure works.

#### **Dahod:**

Predominantly residential with semi-urban characteristics; waste composition estimated at **55 % wet**, **30 % dry**, and **15 % inert**. Limited segregation leads to mixed streams; most recyclable recovery is by informal collectors.

### **Narmada (Rajpipla):**

Smaller town areas show a biodegradable fraction exceeding **60 %**, mostly kitchen waste, while **dry recyclables (25 %)** come from local markets. Pilot composting sites are functional at ward level.

### **Panchmahal:**

Urban areas such as Godhra and Halol generate mixed municipal and commercial waste—roughly **45 % wet**, **35 % dry**, and **20 % inert**. Plastic packaging and disposable materials have increased with industrial growth.

### **Chhota Udepur:**

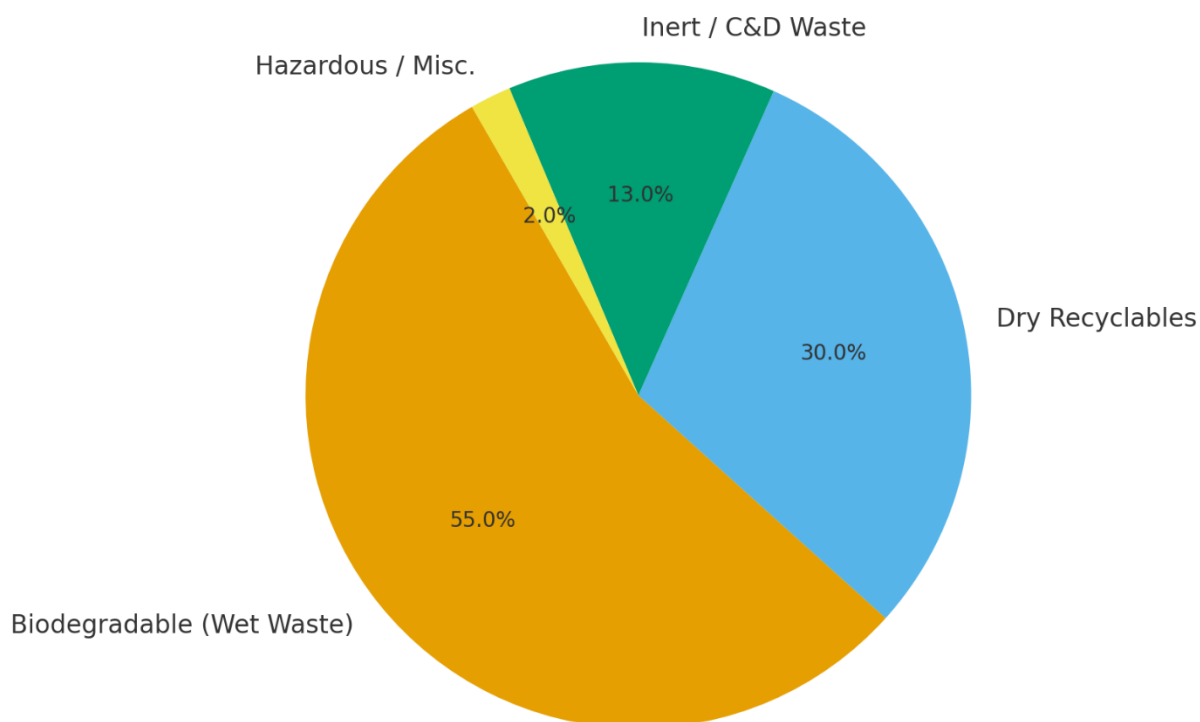
The smallest generator in the region; waste is largely biodegradable ( $\approx$  **65 %**) with small portions of plastics and inerts. Composting and community pits are the preferred processing methods.

### **Seasonal and Event-Based Variation**

- **Festivals (Navratri, Diwali, Ganesh Chaturthi):** Temporary surges of **15–25 %** in total waste, mainly from decorations, food, and plastics.
- **Monsoon season:** Higher moisture content and heavier biodegradable loads.
- **Industrial and market cycles:** Surat and Bharuch see fluctuating packaging waste from textile / chemical sectors.

### **Implications for Processing**

1. High biodegradable content across all districts supports **composting and biomethanation** as primary wet-waste management routes.
2. Substantial dry fractions justify **Material Recovery Facilities (MRFs)** and **Refuse-Derived Fuel (RDF)** production, especially in Surat, Vadodara, and Bharuch.
3. Inert fractions require **engineered landfills or sanitary cells** to prevent leachate and riverine contamination.
4. Districts with smaller quantities (Narmada, Chhota Udepur) should promote **decentralized composting units** at ward / village cluster



**Figure 12 Typical Composition of Municipal Solid Waste in Lower Narmada Basin (Gujarat).**

**\*Source:** Gujarat Pollution Control Board (GPCB) MPR 2023–24; Central Pollution Control Board (CPCB) SWM Annual Report 2023; Surat & Vadodara Municipal Corporation data.

- Waste composition remains broadly consistent with Gujarat’s state average, confirming the dominance of organic waste in total generation.
- Rising dry fractions in Bharuch and Panchmahal signal the need for formal recycling linkages and EPR-based plastic recovery.
- Segregation at source is improving in larger cities but remains limited in smaller ULBs.
- Seasonal peaks highlight the importance of flexible collection scheduling and temporary storage capacity.

### 4.3 Collection, Transportation, and Disposal Facilities

Solid waste management (SWM) in the districts of the Narmada Basin, Madhya Pradesh, has been documented through their respective District Environmental Plans (DEPs). The data tabulated in **Annexure Table A6 and A7** provides a comprehensive overview of the existing infrastructure, processes, and gaps across the waste management chain.

At the source level, segregation of dry and wet waste has been promoted, though the effectiveness varies across districts. Primary collection is generally carried out through waste

collection trolleys with separate compartments, enabling household-level segregation. In addition, mini collection trucks with separate compartments are deployed for secondary collection and transportation to processing facilities.

For wet waste management, two main pathways are observed: composting units and bio-methanation plants. Composting is widely adopted at both decentralized and centralized levels, while bio-methanation initiatives are present in selected districts but face challenges in scaling up due to technological and maintenance issues.

Dry waste management is primarily handled through Material Recovery Facilities (MRFs), where recyclable materials are sorted and sent for recycling. However, the coverage of MRFs remains limited in many districts, leading to inefficient recovery and leakage of recyclables into the landfill stream.

For non-recyclable waste, sanitary landfills are designated as the final disposal option. While some districts have operational landfills, others continue to face issues of inadequate infrastructure, scientific landfill development, and leachate management.

Across all stages like collection, transportation, and disposal, gaps and challenges remain significant. These include inadequate source segregation, limited capacity of collection fleets, insufficient infrastructure for composting and bio-methanation, underutilization of MRFs, and the need for scientifically designed and managed landfills. Strengthening institutional mechanisms, capacity building, and community participation are essential to improving SWM across the Narmada Basin.

The collection, transportation, and disposal systems for municipal solid waste (MSW) in the **Lower Narmada Basin**—covering the districts of **Surat, Vadodara, Bharuch, Dahod, Narmada, Panchmahal, and Chhota Udepur**—have undergone steady improvements in recent years under the **Solid Waste Management Rules, 2016**, and the **Swachh Bharat Mission (Urban)**. The **Gujarat Pollution Control Board (GPCB)** monitors performance indicators such as door-to-door collection coverage, segregation levels, processing capacity, and legacy waste remediation through monthly progress reports.

## Collection Systems and Door-to-Door Coverage

All major urban centers in the lower basin have implemented **door-to-door (D2D) collection** of waste from households, commercial establishments, and institutions. The extent of coverage varies by ULB size and resources, as summarized below:

*Table 20 Door-to-door collection and segregation status in Lower Narmada Basin districts.*

| District/<br>Major ULB        | Door-to-Door<br>Collection<br>Coverage (%) | Segregation at<br>Source (%) | Remarks / Status                                                                            |
|-------------------------------|--------------------------------------------|------------------------------|---------------------------------------------------------------------------------------------|
| <b>Surat</b>                  | 100                                        | 90–95                        | Fully mechanized system with GPS-tracked vehicles; 100% ward coverage.                      |
| <b>Vadodara</b>               | 98                                         | 85–90                        | Well-established D2D collection with zonal transfer stations; segregation improving.        |
| <b>Bharuch</b>                | 90                                         | 65–70                        | Partial segregation; coverage achieved in all wards. ULB planning cluster-level composting. |
| <b>Dahod</b>                  | 85                                         | 50–60                        | Collection in all urban wards; segregation limited to select colonies.                      |
| <b>Narmada<br/>(Rajpipla)</b> | 80                                         | 45–55                        | Manual collection in most wards; small pilot segregation programs active.                   |

| District/<br>Major ULB        | Door-to-Door<br>Collection<br>Coverage (%) | Segregation at<br>Source (%) | Remarks / Status                                                                       |
|-------------------------------|--------------------------------------------|------------------------------|----------------------------------------------------------------------------------------|
| Panchmahal<br>(Godhra, Halol) | 88                                         | 60–65                        | Mechanized collection in major towns; smaller nagarpalikas rely on manual trolleys.    |
| Chhota Udepur                 | 70                                         | 40–50                        | Coverage in core areas; semi-urban and rural periphery still dependent on open points. |

*\*(Sources: GPCB Monthly Progress Reports, 2023–24; CPCB SWM Annual Report, 2023; Surat and Vadodara Municipal Data.)*

## Transportation and Transfer Infrastructure

Efficient transportation systems are critical to maintain uninterrupted waste movement from collection points to processing and disposal sites. Most large ULBs in the basin operate **mechanized vehicles** such as compactors, tippers, and closed-body trucks. Smaller towns continue to use tractors, tricycles, and open trolleys.

- **Surat:** Operates a fleet of over **650 GPS-enabled vehicles**, including compactors, refuse collectors, and road sweepers. Multiple **transfer stations** and a **centralized material recovery facility (MRF)** ensure uninterrupted waste flow to RDF and WtE plants.
- **Vadodara:** Maintains a fleet of **~350 vehicles** (compactors, mini-tippers, tricycles). **Six zonal transfer stations** and a **mechanical workshop** handle daily operations.
- **Bharuch and Ankleshwar:** Operate smaller vehicle fleets with mixed mechanized and manual systems. Waste from residential areas is transported to the designated landfill site at Bharuch.
- **Dahod, Panchmahal, and Narmada:** Use **tractor–trolley systems** with manual loading. Few compactors are available in district headquarters. Intermediate waste



collection centers (IWCCs) are planned to improve logistics.

- **Chhota Udepur:** Relies primarily on small trolleys and handcarts. Pilot mechanical collection vehicles have been introduced under SBM(U) funding.

#### Challenges:

- Lack of **covered vehicles** in smaller towns leads to spillage and littering along transport routes.
- **Limited transfer infrastructure** in remote areas increases operational costs and reduces collection efficiency.
- **Inconsistent segregation** at source results in mixed waste entering transport chains, limiting processing efficiency downstream.

#### Waste Processing and Disposal

Processing and disposal capacities vary significantly across the districts of the lower basin. Larger cities (Surat and Vadodara) have achieved full processing capacity, while smaller ULBs continue to depend on controlled or semi-controlled dump sites.

*Table 21 Status of waste processing and disposal facilities in Lower Narmada Basin districts.*

| District / ULB | Primary Processing Method | Landfill / Dumpsite Location | Remarks                                                              |
|----------------|---------------------------|------------------------------|----------------------------------------------------------------------|
| Surat          | Composting, RDF, WtE      | Khajod-Integrated Facility   | Scientific landfill & large-scale RDF/WtE operations (Abellon, SMC). |

| <b>District / ULB</b>     | <b>Primary Processing Method</b>     | <b>Landfill / Dumpsite Location</b> | <b>Remarks</b>                                         |
|---------------------------|--------------------------------------|-------------------------------------|--------------------------------------------------------|
| <b>Vadodara</b>           | Composting, Biomethanation           | Moti Baug / Kapurai Landfill        | Engineered landfill; biomethanation plant operational. |
| <b>Bharuch</b>            | Composting (proposed), RDF (planned) | Near-Ankleshwar–Bharuch cluster     | New landfill cell under PPP planning.                  |
| <b>Dahod</b>              | Open dumping (partially remediated)  | Devgadh, Baria dumpsite             | Legacy waste remediation under progress.               |
| <b>Narmada (Rajpipla)</b> | Manual composting                    | Near Rajpipla town                  | Small landfill; biomining DPR under preparation.       |
| <b>Panchmahal</b>         | Composting, manual segregation       | Godhra outskirts                    | Semi-controlled landfill; leachate control required.   |
| <b>Chhota Udepur</b>      | Open dumping                         | Municipal boundary periphery        | Site identified for future scientific landfill.        |

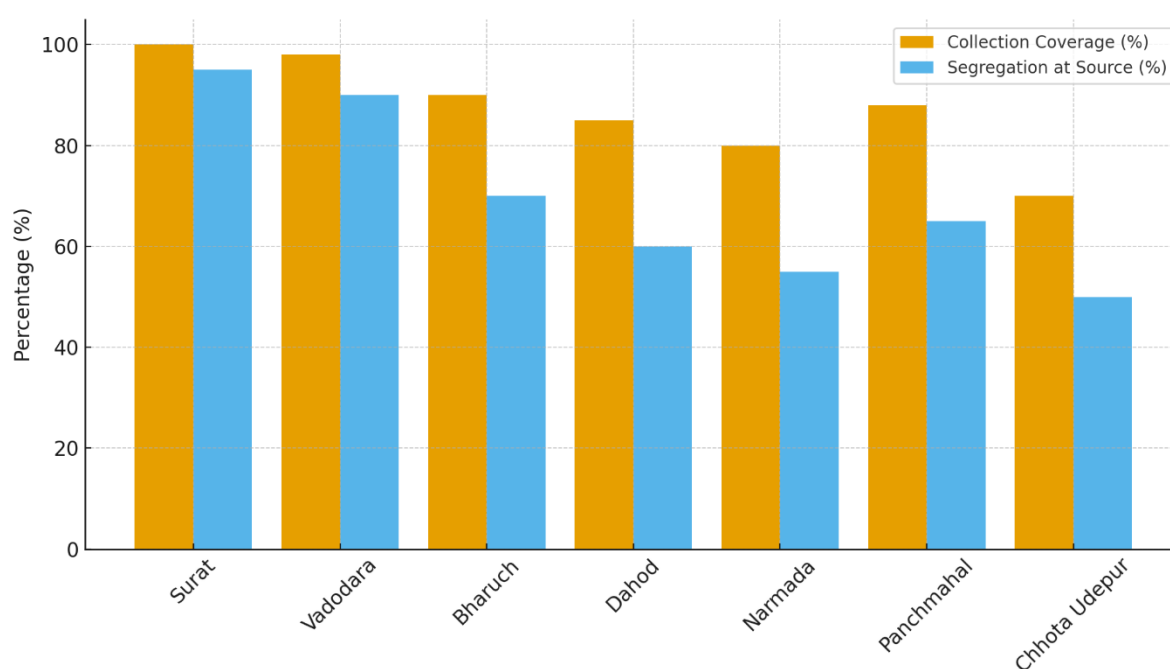
\*(Sources: GPCB MPR 2023–24; CPCB SWM Report 2023; Surat & Vadodara Municipal Reports; Local ULB DPRs.)

### Vehicle and Equipment Utilization

- **Surat:** Fully mechanized with real-time GPS tracking, route optimization, and automatic attendance monitoring for sanitation staff.

- **Vadodara:** Mechanized collection and transfer stations with periodic maintenance.
- **Medium ULBs (Bharuch, Panchmahal):** Semi-mechanized with scheduled collection timings.
- **Small ULBs (Narmada, Dahod, Chhota Udepur):** Manual systems; pressing need for compactors and covered vehicles.

GPCB has advised all ULBs to adopt “**Zero Open Transportation**” by 2030, with covered and leak-proof vehicles to prevent secondary pollution and littering.



*Figure 13 Waste Collection and Segregation Efficiency (Lower Narmada Basin, Gujarat).*

*\*Source:* Gujarat Pollution Control Board (GPCB) MPR 2023-24; CPCB SWM Annual Report 2023; Surat and Vadodara Municipal Corporation data.

## 4.4 Status of Dumping Sites and Legacy Waste

### 4.4.1 Status Legacy Waste in Narmada Basin ULBs

Legacy waste management in the Narmada Basin reflects the intersection of historical urbanization trends, evolving regulatory frameworks, and current policy efforts aimed at environmental restoration. Each district and its Urban Local Bodies (ULBs) are grappling with accumulated waste generated over many years, necessitating a comprehensive strategy incorporating scientific remediation, monitoring, and stakeholder engagement. Under the Solid Waste Management Rules, 2016, and guidelines of the Central Pollution Control Board

(CPCB), ULBs are mandated to clear legacy waste through biomining, bioremediation, or scientific disposal. This report presents the status of dumping sites and legacy waste in the basin districts.

**Table 22** for legacy waste status illustrates proactive steps taken by Madhya Pradesh authorities in a range of ULBs and detailed overview is tabulated in Annexure **Table A8**:

- ULBs such as Alirajpur, Bhavra, Jobat, Badwani, Rajpur, Multai, Betul, Dewas, Khategaon, Dhar (city), Kukshi, Manawar, Harda, Seoni Malwa, Itarsi, Narmadapuram, Mandideep, Bareli, Nasrullaganj, Jatara, Hatta, Balaghat, Mandla, Nainpur, and Pandhurna all reported as Work Started, indicating active legacy waste remediation primarily via biomining, bioremediation, or scientific disposal. This marks substantial government engagement aligning with the SWM Rules, 2016.
- ULBs such as Nepanagar, Sohagpur, Damoh, Ranapur, Pithampur, Mhowgaon, Petlawad, Chhanera, Bhikangaon, Betma, Kasrawad, and Junnardeo are flagged as Financial Evaluation Pending or Received at State SLTC (State Level Technical Cell) Pending. These delays signify ongoing processes of tendering, funding approval, and technical review. Such systemic bottlenecks highlight common governance challenges, calling for streamlined PPP (public-private partnership) models and state-level intervention.
- In some locations, Technical Pending status, such as Seoni with 1,57,664 MT, signals that remediation projects await necessary scientific and engineering clearance, reflecting the complexity of constructing effective legacy waste recovery infrastructure.

In the Narmada Basin, years of unregulated dumping created sprawling waste landscapes that threaten groundwater, soil morphology, and public health. The state's approach to management is rooted in

*Table 22 Legacy waste in Narmada basin ULBs*

| District  | Total Legacy Waste (MT) |
|-----------|-------------------------|
| Alirajpur | 54,253                  |
| Barwani   | 64,617                  |

| <b>District</b>            | <b>Total Legacy Waste (MT)</b> |
|----------------------------|--------------------------------|
| Betul                      | 1,50,363                       |
| Burhanpur                  | 44,249                         |
| Dewas                      | 1,15,072                       |
| Dhar                       | 2,93,903                       |
| Harda                      | 19,370                         |
| Hoshangabad (Narmadapuram) | 2,60,629                       |
| Indore                     | 2,99,206                       |
| Jabalpur                   | 2,90,150                       |
| Raisen                     | 1,00,053                       |
| Sehore                     | 12,636                         |
| Sagar                      | 26,446                         |

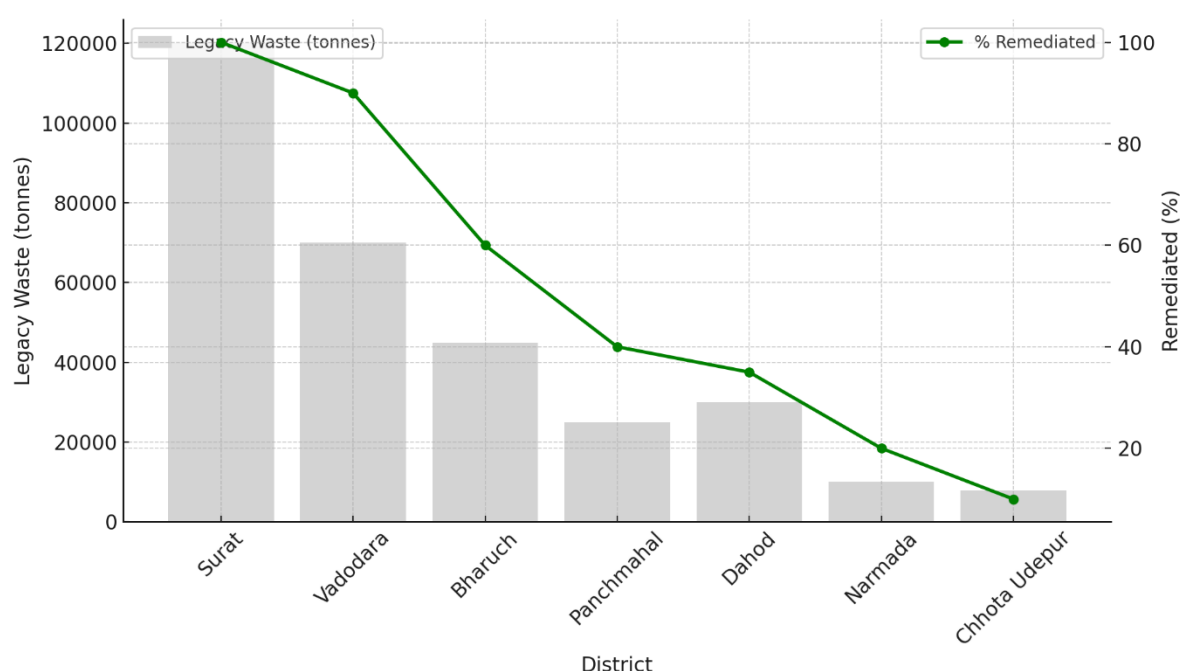
*\*Sources: Six Monthly Progress Report by Govt. of Madhya Pradesh in OA No. 606 of 2018 for State of Madhya Pradesh (Compliance of MSW Management Rules, 2016 and Other Environmental Issues), National Green Tribunal, September 2025*

- **Biomining and Resource Recovery:** Turning legacy waste into a resource stream, with staged excavation, mechanical separation, and recycling. Bioremediation techniques transform organic fractions into compost, while inert materials are disposed of scientifically.
- **Decentralized Processing:** Adoption of localized waste processing, with facilities constructed in moderate-sized towns, aligning with global circular economy models and the principles of Integrated Sustainable Waste Management (ISWM).
- **Stakeholder Inclusion:** Increasing involvement of local communities, NGOs, and authorized waste pickers, improving transparency and labor rights

Legacy waste refers to old, unsegregated municipal solid waste that has accumulated over the years in open dumpsites. The remediation of such sites is a major objective under the Solid Waste Management Rules, 2016, and is monitored by both GPCB and CPCB through monthly progress and tribunal compliance reports.

In the Lower Narmada Basin of Gujarat, nearly all ULBs have identified legacy dumpsites. The total quantity of legacy waste across the seven basin districts is estimated at  $\approx 3.8 - 4.2$  lakh tonnes, of which a large share lies within the urban limits of Surat, Vadodara, and Bharuch.

Remediation is being carried out through biomining, resource recovery, and scientific capping under supervision of the GPCB, with financial support from the Swachh Bharat Mission (Urban) and state programs.



**Graph 115 Legacy Waste Remediation Progress (Lower Narmada Basin, Jan 2024).**

**\*Source:** Gujarat Pollution Control Board (GPCB) MPR 2023–24; CPCB SWM Annual Report 2023; ULB legacy waste remediation reports (Surat, Vadodara, Bharuch, Dahod, Panchmahal, Narmada, Chhota Udepur).

## District-wise Status of Legacy Waste (2024)

*Table 23 District-wise status of legacy waste remediation in Lower Narmada Basin ULBs (as of Jan 2024).*

| District<br>Major ULB | Estimated<br>Legacy Waste<br>(tonnes) | Remediated<br>(%) | Method Used / Status                                                                                 | Remarks /<br>Source                         |
|-----------------------|---------------------------------------|-------------------|------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Surat                 | ≈ 1,20,000 t                          | 100 %             | Legacy waste at Khajod site fully biomined and reclaimed. Recovered land used for WT E facilities.   | SMC Report 2024; GPCB MPR 2023-24           |
| Vadodara              | ≈ 70,000 t                            | 90 %              | Biomining at Kapurai VMC landfill under progress; residual inerts being capped scientifically.       | SWM Dept 2024; GPCB Report 2023             |
| Bharuch               | ≈ 45,000 t                            | 60 %              | Legacy site identified near Ankleshwar; biomining tender awarded; cluster-landfill project proposed. | Bharuch ULB DPR; GPCB MPR 2024              |
| Dahod                 | ≈ 30,000 t                            | 35 %              | Bioremediation initiated at Devgad Baria dumpsite after repeated fire incidents.                     | GPCB District Inspection Report 2023        |
| Narmada<br>(Rajpipla) | ≈ 10,000 t                            | 20 %              | Site mapped; ULB preparing DPR for biomining and new sanitary landfill.                              | Rajpipla Nagar Palika Report; GPCB MPR 2023 |

|                                          |                         |             |                                                                                                                |
|------------------------------------------|-------------------------|-------------|----------------------------------------------------------------------------------------------------------------|
| <b>Panchmahal<br/>(Godhra<br/>Halol)</b> | <b>&amp; ≈ 25,000 t</b> | <b>40 %</b> | Biomining ongoing at Godhra site; recovered inerts GPCB Regional being shifted to engineered Office 2024 cell. |
| <b>Chhota<br/>Udepur</b>                 | <b>≈ 8,000 t</b>        | <b>10 %</b> | Initial survey completed; remediation proposal submitted to GPCB for approval. GPCB MPR 2024; ULB submission   |

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*\*(Sources: GPCB Monthly Progress Reports 2023-24; CPCB SWM Annual Report 2023; ULB status updates.)*

#### 4.4.2 Status of Dumping Sites in Narmada Basin ULBs

The status of municipal solid waste (MSW) management highlighted in **Table 18** in selected Urban Local Bodies (ULBs) that fall under the Narmada River Basin in Madhya Pradesh. Since these cities directly or indirectly influence the environmental health of the river system, the data serves as an important indicator of basin-level waste management progress.

##### Key Observations in the Narmada Basin

- **Zero Processing Gap Across ULBs**

All listed basin ULBs, including Bhopal, Indore, Jabalpur, and Sagar, demonstrate complete processing of generated waste in both November 2022 and the current reporting period. This ensures that untreated solid waste does not enter the natural environment and reduces the risk of dumping into Narmada's catchment areas.

- **Rising Waste Generation with Urbanization**

Growth in waste generation is visible in several ULBs:

- Indore increased from 984.6 TPD to 1192 TPD.
- Bhopal rose from 808.6 TPD to 823.3 TPD.



- Sagar and Chhindwara also show significant jumps.

While these increases reflect urban and economic expansion, they also emphasize the need for continued strengthening of waste management systems to safeguard riverine ecosystems.

### **Progress in Dumpsite Remediation**

- Proper remediation of old dumpsites is particularly relevant in the Narmada Basin, as leachate from legacy waste poses a major contamination threat to groundwater and river flows.
- Complete remediation has been achieved in Bhopal, Indore, Jabalpur, Burhanpur, Chhindwara, and Sagar.
- Dewas and Khandwa, which were earlier at the tendering/DPR preparation stage, are now undergoing active remediation. This indicates progress toward basin-wide reduction of river pollution sources.

### **Indore and Bhopal as Flagship Models**

Indore, with the largest daily waste generation (1192 TPD), and Bhopal, as the state capital, have achieved full processing with remediated dumpsites, positioning themselves as benchmarks for sustainable solid waste management within the Narmada Basin.

### **Basin-Level Significance**

These advances in ULB waste management are highly significant for the Narmada River Basin's ecological integrity. By achieving 100% processing and accelerating dumpsite remediation, these cities are directly contributing to:

- Reduction of leachate contamination to river tributaries and groundwater.
- Prevention of open dumping, which often affects floodplains and riparian ecosystems along the basin.
- Establishment of replicable models for other basin towns and smaller ULBs yet to achieve full remediation.

### **Dhar Road Dumpsite Profile**

The Dhar Road Dumpsite, located in Indore, Madhya Pradesh as depicted in **Table 18** (22.705°N, 75.88°E), spans approximately 15 acres and receives around 300 tons of mixed solid waste (MSW) and construction & demolition (C&D) debris daily. Managed by the Indore Municipal Corporation, this government-owned site remains active but lacks an immediate remediation plan. The dumpsite poses several environmental risks, including leachate generation and recurring fire incidents, primarily due to methane emissions from decomposing waste. Its proximity to the Gambhir River (about 3 km away) and a nearby industrial area further elevates the potential for groundwater and air pollution. Despite these challenges, no concrete steps have yet been initiated to mitigate the hazards associated with the site.

*Table 24 Status of Dhar Road side dumpsite*

| Parameter                   | Details                                                         |
|-----------------------------|-----------------------------------------------------------------|
| <b>Name</b>                 | Dhar Road Dumpsite                                              |
| <b>Location</b>             | Dhar Road, Indore, Madhya Pradesh                               |
| <b>Coordinates</b>          | 22.705°N, 75.88°E                                               |
| <b>Area</b>                 | 15 acres                                                        |
| <b>Waste Quantity (TPD)</b> | 300 tons/day                                                    |
| <b>Waste Type</b>           | Municipal Solid Waste (MSW) and Construction & Demolition (C&D) |
| <b>Ownership/Authority</b>  | Government – Indore Municipal Corporation                       |
| <b>Status</b>               | Active                                                          |
| <b>Key Issues</b>           | Leachate generation, Fire incidents                             |
| <b>Nearby Receptors</b>     | Gambhir River (3 km), Industrial area nearby                    |
| <b>Risk Highlight</b>       | Fire risk due to methane emissions                              |

\*Source: MPCB District environment plan

*Table 25 Status of dumping sites in Narmada basin ULBs*

| S. N. | ULB Name | Generation (Tons, Nov-22) | Processing (Tons, Nov-22) | Processing Gap (Nov-22) | Dumpsite Status (Nov-22) | Generation (Current) | Processing (Current) | Processing Gap (Current) | Dumpsite Status (Current) |
|-------|----------|---------------------------|---------------------------|-------------------------|--------------------------|----------------------|----------------------|--------------------------|---------------------------|
|-------|----------|---------------------------|---------------------------|-------------------------|--------------------------|----------------------|----------------------|--------------------------|---------------------------|

|    |            |        |        |   |                 |        |        |   |                                |
|----|------------|--------|--------|---|-----------------|--------|--------|---|--------------------------------|
| 1  | Bhopal     | 808.6  | 808.6  | 0 | Remediated      | 823.3  | 823.3  | 0 | Remediated                     |
| 2  | Burhanpur  | 86.97  | 86.97  | 0 | Remediated      | 86.97  | 86.97  | 0 | Remediated                     |
| 3  | Chhindwara | 70.15  | 70.15  | 0 | Remediated      | 96.90  | 96.90  | 0 | Remediated                     |
| 4  | Dewas      | 103.67 | 103.67 | 0 | Under Tendering | 108.23 | 108.23 | 0 | Remediation work under process |
| 6  | Indore     | 984.6  | 984.6  | 0 | Remediated      | 1192.0 | 1192.0 | 0 | Remediated                     |
| 7  | Jabalpur   | 506.19 | 506.19 | 0 | Remediated      | 507.93 | 507.93 | 0 | Remediated                     |
| 8  | Khandwa    | 42.67  | 42.67  | 0 | DPR Prepared    | 46.30  | 46.30  | 0 | Remediation work under process |
| 13 | Sagar      | 87.96  | 87.96  | 0 | Remediated      | 112.29 | 112.29 | 0 | Remediated                     |

*\*Source: Presentation cum Compliance by Government of Madhya Pradesh in OA No. 606 of 2018 (Compliance of MSW Management Rules, 2016), submitted to the National Green Tribunal, September 2025)*

Uncontrolled dumping of solid waste has historically been one of the key environmental challenges in the **Lower Narmada Basin**, contributing to soil and groundwater contamination, odour nuisance, and visual degradation. Following the enforcement of the **Solid Waste Management Rules, 2016**, and directions from the **National Green Tribunal (O.A. No. 606/2018)**, all Urban Local Bodies (ULBs) in Gujarat have been directed by the **Gujarat Pollution Control Board (GPCB)** to identify, quantify, and remediate their existing dumpsites.

By **January 2024**, most ULBs in the lower basin have either (i) remediated old dumpsites through biomining, or (ii) initiated the development of **scientific landfills** for future disposal. The overall approach now focuses on transitioning from open dumping to **engineered, environmentally compliant landfill systems**.

### District-Wise Status of Dumping Sites (as of Jan 2024)

*Table 26 Status of existing dumping sites in Lower Narmada Basin districts (Jan 2024)*

| District/<br>Major<br>ULB | Existing<br>Dumpsite<br>Location            | Area<br>(Ha) | Status<br>(Jan 2024)                         | Remarks / Source                                                                                                     |
|---------------------------|---------------------------------------------|--------------|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| Surat                     | Khajod                                      | 80           | <b>Closed<br/>Remediated</b>                 | Former dumpsite fully<br>& reclaimed; site now hosts<br>integrated SWM & WtE facility.<br>(SMC Report, 2024)         |
| Vadodara                  | Kapurai                                     | 75           | <b>Partially<br/>Under<br/>Remediation</b>   | <b>Active;</b> Biomining ongoing; residual<br>inerts to be capped under GPCB<br>supervision. (VMC SWM Dept,<br>2024) |
| Bharuch                   | Near<br>Ankleshwar<br>Industrial<br>Cluster | 25           | <b>Active (Controlled<br/>Dumping)</b>       | New sanitary landfill under<br>design; partial waste<br>containment practiced. (GPCB<br>RO Bharuch, 2023)            |
| Dahod                     | Devgadh Baria                               | 18           | <b>Partially<br/>Biomining<br/>Initiated</b> | <b>Active;</b> Dumpsite fenced; fire control<br>and leachate management in<br>progress. (GPCB MPR, 2023–<br>24)      |
| Narmada<br>(Rajpipla)     | Near Rajpipla<br>Town                       | 10           | <b>Active<br/>(Uncontrolled)</b>             | Old dumpsite without liner;<br>proposal submitted for new<br>engineered landfill. (GPCB<br>District Office, 2024)    |

|                            |                  |       |                              |                                                                                                  |
|----------------------------|------------------|-------|------------------------------|--------------------------------------------------------------------------------------------------|
| <b>Panchmahal (Godhra)</b> | Godhra Outskirts | 20    | <b>Under Remediation</b>     | Biomining in progress; inert capping planned post-screening. <i>(GPCB Regional Office, 2024)</i> |
| <b>Chhota Udepur</b>       | Near Boundary    | ULB 6 | <b>Active (Uncontrolled)</b> | Dumpsite identified; DPR under preparation for cluster-level landfill. <i>(ULB Data, 2024)</i>   |

*\*(Sources: GPCB MPR 2023–24; CPCB SWM Annual Report 2023; ULB DPRs and local inspection reports.)*

### Site Conditions and Environmental Risks

- **Leachate generation:** Sites at Vadodara, Bharuch, and Dahod show moderate leachate discharge due to mixed-waste accumulation and rainfall infiltration.
- **Groundwater contamination risk:** GPCB monitoring indicates increased conductivity and BOD levels near legacy sites, particularly in **Bharuch** and **Godhra**.
- **Fire hazard:** Seasonal fires during dry months are recurrent at Dahod and Panchmahal sites, attributed to methane generation.
- **Odour and visual impact:** Active dumping near Narmada and Chhota Udepur town limits causes odour nuisance and aesthetic degradation.

### Upgradation and Remediation Initiatives

#### 1. Scientific Landfill Development:

- Surat and Vadodara have already established or redeveloped engineered landfill facilities.
- Bharuch and Panchmahal are developing cluster-level sanitary landfills with GPCB approval.
- Narmada and Chhota Udepur are planning smaller capacity, lined landfill cells.

#### 2. Biomining and Inert Capping:

- Biomining operations are underway at Vadodara, Panchmahal, and Dahod dumpsites.
- Recovered land is being converted into green zones or reused for SWM infrastructure.

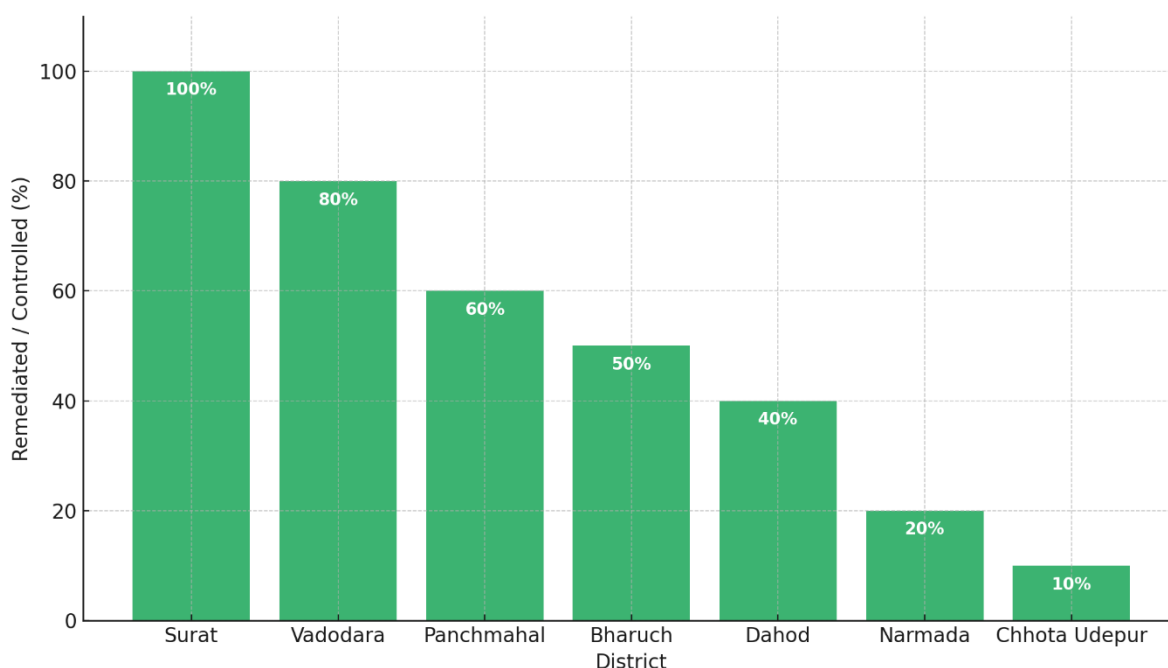
#### 3. Environmental Safeguards:

- Fencing, leachate collection drains, and stormwater diversion structures installed at active sites.

- Periodic water quality monitoring conducted by GPCB to track improvement post-remediation.

#### 4. Cluster Approach:

- GPCB has encouraged small ULBs (Narmada, Chhota Udepur, parts of Panchmahal) to adopt a **cluster-level approach** for shared processing and landfill facilities.



**Graph 116 Status of Dumpsites in Lower Narmada Basin (Gujarat, 2024)**

\*(Source: GPCB MPR 2023–24; CPCB SWM Annual Report 2023; ULB Data)

## 4.5 Waste to Energy

### 4.5.1 Wet Waste Processing Facilities in Urban Local Bodies (ULBs) under Narmada River Basin

The Urban Local Bodies (ULBs) within the Narmada River Basin have established a diverse range of wet waste processing facilities aimed at ensuring scientific treatment of biodegradable waste. These facilities primarily include aerobic windrow composting, pit-based/vermi composting, anaerobic systems, and composting with/without Refuse-Derived Fuel (RDF) integration. The details are provided in **Annexure Table A9**.

#### Key Observations:

### **1. Technology Mix:**

- A large number of ULBs rely on pit-based/vermi composting, which is suitable for small- to medium-scale towns such as Shahpura (Dindori), Bagli (Dewas), Kukshi (Dhar), and multiple towns in Raisen and Sehore districts.
- Major cities like Indore, Bhopal, Jabalpur, Sagar, Katni, Mandla, and Khandwa have adopted aerobic windrow composting systems, some integrated with RDF linkages, which ensure large-scale treatment of municipal wet waste.
- Select ULBs such as Bhopal (M Corp.), Hoshangabad (Seoni-Malwa), and Sagar (M Corp.) have operational anaerobic composting facilities, reflecting a move towards biogas/energy recovery-based solutions.

### **2. District-Level Distribution:**

- Indore, Jabalpur, and Bhopal have the highest concentration of composting facilities, indicating their leadership in adopting decentralized waste management solutions.
- Sehore, Raisen, and Narsimhapur districts also demonstrate strong coverage, with multiple small-scale composting units spread across different ULBs, ensuring localized treatment.
- Smaller districts like Alirajpur, Anuppur, Dindori, Mandla, and Harda have fewer but strategically placed composting units tailored to their population and waste generation.

### **3. Integration with RDF:**

- Cities such as Anuppur (Bijuri & Pasan), Barwani (Anjad, Niwali Burjurg, Thikari), Dhar (Kukshi), Mandla (Nainpur), Katni (Murwara), and Sagar (M Corp.) have facilities that integrate aerobic composting with RDF, thereby contributing to resource recovery and reduced landfill dependency.

### **4. Environmental Significance:**

- The spread of composting facilities across the basin helps minimize the

quantum of biodegradable waste reaching dumpsites, thereby reducing leachate formation and methane emissions, which are critical for protecting the Narmada River and its tributaries from pollution.

- Decentralized composting also promotes circular economy practices by converting wet waste into compost, which can be utilized in agriculture and horticulture within the basin.

The Urban Local Bodies (ULBs) located within the **Lower Narmada River Basin of Gujarat** have developed a variety of **wet-waste processing systems** to ensure scientific treatment of biodegradable waste in compliance with the **Solid Waste Management Rules, 2016**. These facilities include **aerobic windrow composting, pit-based/vermi composting, biomethanation (anaerobic systems), and co-composting units with Refuse-Derived Fuel (RDF) integration** for recovery of resources and minimization of landfill loads.

## Key Observations

### 1. Technology Mix

- **Small and Medium Towns (Bharuch, Dahod, Narmada, Panchmahal, Chhota Udepur):**

A majority of these ULBs rely on **pit-based or vermi composting** systems suited for low-volume waste (below 50 TPD). Such systems are operated at the ward or community level and maintained by local municipal staff. Example installations include **aerobic compost pits at Rajpipla (Narmada), community composting in Dahod, and market-waste pits in Godhra (Panchmahal)**.

- **Major Cities (Surat and Vadodara):**

These ULBs have adopted **large-scale aerobic windrow composting** integrated with **biomethanation and RDF linkages**, enabling full treatment of the city's organic waste.

- **Surat Municipal Corporation (SMC)** operates one of the largest composting and biomethanation facilities in western India, processing about 1,150 TPD of wet waste.
- **Vadodara Municipal Corporation (VMC)** manages composting and biogas



plants at **Kapurai and Moti Baug**, producing organic manure and electricity from biogas.

- **Emerging Technologies:**  
**Co-composting** of sewage sludge and wet municipal waste has been initiated by **Panchmahal (Godhra)** and **Bharuch**, improving nutrient quality of compost and reducing sludge-disposal burdens.

## 2. District-Level Distribution

- **High Capacity Districts – Surat and Vadodara:**  
These two districts account for nearly **85 % of total wet-waste processing capacity** in the Lower Basin. Surat alone treats 100 % of its wet waste, while Vadodara achieves ~87 %.
- **Moderate Coverage – Bharuch and Panchmahal:**  
Both have functional composting units (30–55 TPD capacity) and are expanding decentralized systems under SBM(U).
- **Limited Coverage – Dahod, Narmada, and Chhota Udepur:**  
These ULBs operate small community composters ( $\leq 10$  TPD) with partial segregation; DPRs for cluster-level plants are under preparation with GPCB support.

## 3. Integration with RDF and Energy Recovery

- **Surat:** Integrated **composting + RDF + biomethanation** model at Khajod converts segregated organic waste to compost and biogas, while the residual fraction feeds the WtE plant.
- **Vadodara:** Biomethanation units produce biogas used for street-lighting and power generation; RDF from residual dry waste supports cement-industry co-processing.
- **Bharuch and Panchmahal:** Exploring RDF-linkages with nearby cement kilns to utilize non-recyclable combustible waste from composting facilities.

## 4. Environmental Significance

- **Reduction in Leachate and Methane Emissions:**

Enhanced composting coverage prevents deposition of organic waste in dumpsites, reducing leachate generation and greenhouse-gas emissions near the Narmada River floodplain.

- **Protection of Water Quality:**  
Minimizing organic dumping decreases the biochemical oxygen demand (BOD) load in surface runoff, indirectly improving river-water quality.
- **Circular Economy Promotion:**  
Decentralized composting enables recovery of organic manure for **urban landscaping, agriculture, and horticulture**, creating a sustainable waste-to-resource loop.
- **Community Participation:**  
Surat, Vadodara, and Panchmahal ULBs have established citizen-involvement programs where residents deposit segregated wet waste at fixed times, ensuring cleaner collection streams.

#### **4.5.2 Dry Waste Processing Facilities in ULBs under the Narmada River Basin**

The Urban Local Bodies (ULBs) located within the Narmada River Basin have established Material Recovery Facilities (MRFs) for the management of dry waste. These facilities play a crucial role in segregation, recovery, and recycling of non-biodegradable fractions, thereby reducing the burden on dumpsites and minimizing environmental risks to the river system.

The dataset compiled from the Swachh Bharat Mission MIS (2022–23) highlights district-wise coverage of MRFs across municipalities, municipal corporations, cantonment boards, and nagar parishads. The facilities vary in terms of mechanization levels ranging from manual, semi-automated, to fully automated systems depending on waste generation volumes and operational capacities of respective ULBs. The details are provided in **Annexure Table A10**.

**Key features of these facilities include:**

- **Decentralized dry waste management** is aimed at source-level recovery.
- **Semi-automated and fully automated plants** in larger cities (e.g., Indore, Bhopal, Jabalpur, Khargone, Khandwa, Dhar, Jhabua), which improve efficiency and material

recovery rates.

- **Manual MRFs** in smaller towns and nagar parishads, ensuring local waste sorting and recycling linkages.
- Coverage across multiple districts such as Alirajpur, Anuppur, Balaghat, Barwani, Betul, Bhopal, Burhanpur, Chhindwara, Damoh, Dewas, Dhar, Dindori, Harda, Hoshangabad (Narmadapuram), Indore, Jabalpur, Jhabua, Khandwa, Khargone, Mandla, Katni, Narsinghpur, and Raisen all of which fall in the Narmada Basin.

This mapping provides an integrated picture of dry waste processing infrastructure, enabling better planning, monitoring, and policy alignment for river basin-based solid waste management. Strengthening these facilities, especially upgrading manual units to semi-automated ones will be critical to minimizing leakages of plastic and other dry waste into the Narmada River and its tributaries.



**Figure 14 Material Recovery Facilities (MRF) & Composting Facilities in ULBs**

The Urban Local Bodies (ULBs) across the **Lower Narmada River Basin of Gujarat** have developed a range of **dry waste processing systems** to manage recyclable and non-recyclable components of municipal solid waste in accordance with the **Solid Waste Management Rules, 2016**.

Dry waste in the region primarily comprises **plastics, paper, metals, glass, multilayered packaging (MLP), textiles, and inert fractions**.

Processing facilities include **Material Recovery Facilities (MRFs)**, **plastic baling and shredding units**, and **Refuse-Derived Fuel (RDF)** linkages with cement plants for energy recovery.

The specific details of dry-waste processing infrastructure are presented in *Annexure Table A10*.

## Key Observations

### 1. Technology Mix

- **Material Recovery Facilities (MRFs):**

Almost all ULBs in the basin have operational MRFs or dry-waste sorting sheds.

- **Surat and Vadodara** operate **fully mechanized MRFs** with conveyor belts, segregation platforms, baling machines, and digital weighing systems.
- **Medium towns (Bharuch, Panchmahal, Dahod)** use **semi-mechanized MRFs** equipped with sorting tables and manual balers for plastics and paper.
- **Smaller ULBs (Narmada, Chhota Udepur)** depend on **manual sorting sheds** and private aggregators for recyclables.

- **Plastic Waste Management (PWM) Units:**

- **Surat** has a dedicated **plastic baling and recycling unit** integrated with its RDF plant at Khajod.
- **Vadodara** operates **plastic shredding and co-processing facilities**, sending shredded plastic to nearby cement industries under Extended Producer Responsibility (EPR) mechanisms.

- **RDF & Co-Processing Integration:**

Surat, Vadodara, and Bharuch ULBs forward non-recyclable combustible fractions (plastics, textiles, rubber) to **cement kilns** for RDF co-processing under GPCB authorization.

### 2. District-Level Distribution

- **Surat and Vadodara:**

Represent the most advanced ULBs in Gujarat, with **integrated MRF + RDF systems** operating at full efficiency.

Surat's RDF preparation and plastic recovery facility at **Khajod** is among the largest in the state, processing ~950–1,000 TPD of dry waste.

Vadodara's **Kapurai MRF** handles over 250 TPD of segregated dry waste.

- **Bharuch and Panchmahal:**

Moderate capacity ULBs with semi-mechanized segregation sheds and baling presses. Bharuch channels its non-recyclable waste to **Ambuja Cement (Kodinar)** under a co-processing agreement facilitated by GPCB.

- **Dahod, Narmada, and Chhota Udepur:**

Smaller ULBs with limited infrastructure—operating manual sorting platforms and basic plastic baling setups. GPCB has encouraged cluster-based MRF planning to optimize cost and improve recovery rates.

### 3. Integration with RDF and Resource Recovery

- **RDF Linkages:**

Surat's RDF production (~400 TPD) supplies nearby cement industries for thermal energy substitution. Vadodara also sends non-recyclable waste fractions to co-processing kilns.

- **Recycling Partnerships:**

ULBs collaborate with authorized **plastic recyclers and kabadiwala networks** to recover materials. Surat and Vadodara have digital tracking systems for recyclables.

- **EPR Implementation:**

GPCB facilitates partnerships between ULBs and **Producer Responsibility Organizations (PROs)** to channel multilayered plastic waste under the PWM Rules, 2022.

### 4. Environmental Significance

- **Reduction in Landfill Burden:**

Dry-waste segregation and RDF production significantly reduce the volume of residual waste reaching landfills. Surat and Vadodara collectively divert over **90 % of dry waste** from disposal.

- **Promotion of Circular Economy:**

Recyclable material recovery (plastics, paper, metals) feeds into local recycling industries, generating employment and conserving raw materials.

- **Energy Recovery:**

RDF utilization in cement kilns replaces coal and lowers CO<sub>2</sub> emissions, aligning with Gujarat's decarbonization goals.

- **Pollution Control:**

Proper dry-waste management mitigates open burning of plastics, a key factor in

urban air-quality improvement.

### 4.5.3 Waste-to-Energy Facilities in ULBs of the Narmada River Basin

Urban Local Bodies (ULBs) within the Narmada River Basin are increasingly adopting Waste-to-Energy (WtE) and Bio-CNG technologies to convert municipal solid waste into usable energy. These initiatives not only address the challenge of reducing landfill dependency but also contribute to renewable energy generation, climate mitigation, and circular economy goals.

The compiled data shown in **Table 27** from the Swachh Bharat Mission MIS (2022–23) and other government sources highlights major projects in Jabalpur, Indore, Rewa, and Bhopal, all of which fall within the Narmada Basin.

Key highlights include:

- **Jabalpur Waste-to-Energy Plant:** Located at Village Kathoda, this 11.5 MW incineration-based facility is one of the first large-scale operational WtE projects in Madhya Pradesh. It is operated by Jabalpur MSW Pvt. Ltd. and converts mixed waste into power, supplying electricity to the grid.
- **Indore Proposed WtE Plant:** Indore, a leader in waste management, has proposed a 6 MW incineration-based WtE plant, also under Jabalpur MSW Pvt. Ltd. This will further strengthen Indore's waste valorization infrastructure.
- **GOBARDhan Bio-CNG Plant, Indore:** Located at Kabitkhedi, these 20 MTPD Bio-CNG facilities, developed by Indore Municipal Corporation (IMC) in partnership with Mahindra, is Asia's largest Bio-CNG plant. It converts organic waste into compressed biogas, serving as a model for decentralized energy recovery.
- **Bhopal Biomethanation Plant:** Situated at Bittan Market, this 4–5 TPD plant is a smaller-scale biomethanation unit operated by Bhopal Municipal Corporation. It converts organic wet waste into biogas, demonstrating a localized, sustainable waste-to-energy solution.

Together, these initiatives illustrate how districts within the Narmada Basin are leveraging WtE and biomethanation technologies to reduce legacy waste burdens, cut greenhouse gas emissions, and create clean energy. Strengthening such infrastructure is crucial to ensure sustainable river basin-based waste management and to prevent untreated waste from reaching the Narmada River and its tributaries.

*Table 27 List of waste-to-energy facilities under the Narmada River basin ULBs*

| Plant<br>Name/Operator         | Location                  | Capacity          | Type/Details                                     |
|--------------------------------|---------------------------|-------------------|--------------------------------------------------|
| Jabalpur Waste to Energy Plant | Village Kathoda, Jabalpur | 11.5 MW           | Incineration, operated by Jabalpur MSW Pvt. Ltd. |
| Indore Proposed WtE Plant      | Indore                    | 6 MW (planned)    | Incineration, operated by Jabalpur MSW Pvt. Ltd. |
| GOBARDhan Bio-CNG Plant        | Indore                    | 20 MTPD (Bio-CNG) | Asia's largest, at Kabitkhedi, by IMC/Mahindra   |
| Bhopal Biomethanation Plant    | Bittan Market, Bhopal     | 4-5 TPD           | Biogas from organic waste, BMC-ru                |

\*Source: MPCB District environment plan

The **Lower Narmada Basin districts of Gujarat** have progressively adopted a mix of **composting, biomethanation, and waste-to-energy (WtE)** technologies to manage municipal solid waste scientifically and minimize landfill dependency. Under the **Solid Waste Management Rules, 2016**, and the **Swachh Bharat Mission (Urban)**, the **Gujarat Pollution Control Board (GPCB)** has facilitated establishment of both centralized and decentralized processing facilities, focusing on energy recovery from organic and high-calorific waste fractions.

The region's two largest ULBs — **Surat** and **Vadodara** — have already operationalized integrated waste-to-energy and composting systems, while mid-sized ULBs such as **Bharuch** and **Panchmahal** are in advanced planning or implementation phases.

## Key Observations

### 1. Technology Mix and Facility Types

- **Composting Plants:**

Aerobic windrow and vermi-composting are the dominant technologies across smaller ULBs. Surat and Vadodara use large-scale windrow composting integrated with biomethanation.

- **Biomethanation Facilities:**

- **Surat:** Operates biomethanation units at Khajod and other zones, generating **biogas for electricity and transport fuel**.
- **Vadodara:** Runs biomethanation plants at Kapurai and Moti Baug, producing methane for energy and digestate for composting.

- **Waste-to-Energy (WtE) Facilities:**

- **Surat:** Hosts one of Gujarat's largest **WtE plants** (operated by Abellon Clean Energy), converting RDF and organic fractions into electricity (~1,000 TPD capacity).
- **Vadodara:** Has a smaller WtE pilot linked to RDF from its MRF and composting facility.
- **Bharuch:** DPR prepared for RDF-based WtE cluster project; co-processing linkages in progress with nearby cement kilns.

- **Decentralized Units:**

Dahod, Panchmahal, Narmada, and Chhota Udepur ULBs rely primarily on small-scale composting and limited biogas units, suitable for community and institutional waste.

### 2. Integration and Energy Recovery

- **Surat Model:**

The integrated waste-processing complex at **Khajod** processes both wet and dry waste streams, generating RDF, compost, and renewable energy. Electricity produced from the WtE plant is supplied to the local grid under a **Power Purchase Agreement (PPA)** with the state discom.

- **Vadodara Model:**

Combines composting and biomethanation with RDF generation; excess biogas used for lighting and heating applications.



- **Cluster Planning:**

Bharuch and Panchmahal districts are finalizing DPRs for shared RDF and WtE facilities serving nearby small ULBs (e.g., Ankleshwar, Godhra, Halol).

- **Byproduct Utilization:**

Compost and digestate are distributed to local farmers and used in urban landscaping; RDF fractions are co-processed in cement plants.

### **3. Environmental and Economic Benefits**

- **Landfill Diversion:**

Over 80 % of the total waste generated in Surat and Vadodara is processed through composting, biomethanation, or WtE systems, drastically reducing landfill demand.

- **Energy Generation:**

WtE and biomethanation plants contribute to renewable energy generation, supporting Gujarat's clean energy targets.

- **Emission Reduction:**

Controlled anaerobic digestion and energy recovery significantly reduce methane and carbon dioxide emissions compared to open dumping.

- **Circular Economy:**

The recovered compost and energy strengthen circular economy linkages, promoting resource efficiency and sustainable development.

#### **4.5.4 Status of Waste-to-Energy and Composting Facilities in Narmada River Basin Districts**

The Narmada River Basin districts are actively progressing toward integrated solid waste management with a mix of composting units and waste-to-energy (WtE) facilities. The compiled data shown in **Table 21** reflects the status of projects across multiple clusters, highlighting their processing capacity, project developers, and timelines.

##### **Salient Findings:**

##### **1. Operational Energy Plant**

Jabalpur Cluster: With an estimated waste generation of 450 TPD, this cluster has already commissioned a large-scale Energy-based Waste-to-Energy plant. The project, developed by

M/s Essel InfraProjects Ltd, demonstrates the viability of energy recovery from mixed waste in the basin.

## 2. Projects under Environmental Clearance and Construction

Sagar Cluster: Covering 11 ULBs with 185 TPD waste generation, a composting project is under review for Environmental Clearance, with M/s Ramky Enviro Engineers Ltd as the developer. Katni Cluster: With 92 TPD waste generation, construction has already started on a composting facility by M/s Ramky Enviro Engineers Ltd, and the plant was targeted to be operational by June 2017.

## 3. Projects under Bidding and Concession Agreement Stages

Bhopal Cluster: Encompassing 8 ULBs and generating 1065 TPD waste, an energy-based facility is proposed. A concession agreement has been signed with M/s Essel Infra Projects Ltd, and the DPR preparation is underway. Indore Cluster: With 1004 TPD waste from 8 ULBs, the energy project is currently under bidding, with the concession agreement targeted for mid-March 2017. Hoshangabad, Burhanpur, and Dewas Clusters: Together generating nearly 491 TPD of waste (164 TPD, 176 TPD, and 151 TPD, respectively), these composting projects are under bidding, with concession agreements expected by April 2017.

## 4. Clusters in FSR and Bid Preparation Stage

Chhindwara (173 TPD), Betul (89 TPD), Balaghat (97 TPD), Narsinghpur (556 TPD), and Pithampur (241 TPD) have projects in the Feasibility Study Report (FSR) stage, with consultants such as M/s Royal HaskoningDHV and M/s Ecoprop-Meghraj engaged. Bid publication was targeted for March–April 2017.

*Table 28 Status of waste-to-energy facilities under the Narmada River basin ULBs*

| S. No | Name of Cluster | No. of ULBs | Est. Waste Generation (TPD) | Type of Processing | Status   | Remarks          | Timeline                           |
|-------|-----------------|-------------|-----------------------------|--------------------|----------|------------------|------------------------------------|
| 1     | Sagar           | 11          | 185                         | Compost            | Under EC | M/s Ramky Enviro | Environmental Clearance of project |

|    |                 |    |      |         |                                   |                                                            |                                                                  |
|----|-----------------|----|------|---------|-----------------------------------|------------------------------------------------------------|------------------------------------------------------------------|
|    |                 |    |      |         |                                   | Engineers<br>Ltd                                           |                                                                  |
| 2  | Katni           | 5  | 92   | Compost | Constructio<br>n Started          | M/s<br>Ramky<br>Enviro<br>Engineers<br>Ltd                 | Plant<br>operational<br>by June 2017                             |
| 3  | Jabalpur        | 1  | 450  | Energy  | Commissio<br>ned                  | M/s Essel<br>InfraProje<br>cts Ltd                         | -                                                                |
| 4  | Bhopal          | 8  | 1065 | Energy  | Concession<br>agreement<br>Signed | M/s Essel<br>InfraProje<br>cts Ltd                         | DPR<br>Preparation<br>by<br>Concessionai<br>re is<br>underway    |
| 6  | Indore          | 8  | 1004 | Energy  | Under<br>Bidding                  | Concessio<br>naire<br>agreemen<br>t signing<br>is targeted | Concession<br>agreement to<br>be signed by<br>Mid March<br>2017  |
| 8  | Hoshang<br>abad | 14 | 164  | Compost | Under<br>Bidding                  | Concessio<br>naire<br>agreemen<br>t signing<br>is targeted | Concession<br>agreement to<br>be signed by<br>30th April<br>2017 |
| 9  | Burhanp<br>ur   | 10 | 176  | Compost | Under<br>Bidding                  | Concessio<br>naire<br>agreemen<br>t signing<br>is targeted | Concession<br>agreement to<br>be signed by<br>30th April<br>2017 |
| 10 | Dewas           | 24 | 151  | Compost | Under<br>Bidding                  | Concessio<br>naire                                         | Concession<br>agreement to                                       |

|    |             |    |     |         |                                               |                                                                                              |
|----|-------------|----|-----|---------|-----------------------------------------------|----------------------------------------------------------------------------------------------|
|    |             |    |     |         |                                               | agreement be signed by<br>the signing 30th April<br>is targeted 2017                         |
| 16 | Chhindwara  | 20 | 173 | Compost | FSR Prepared.<br>Bid documents to be prepared | FSR Consultant - M/s Royal Haskonin gDHV<br>Bids expected to be published by 31st March 2017 |
| 17 | Betul       | 8  | 89  | Compost | FSR Prepared.<br>Bid documents to be prepared | FSR Consultant - M/s Royal Haskonin gDHV<br>Bids expected to be published by 31st March 2017 |
| 22 | Balaghat    | 13 | 97  | Compost | FSR Prepared.<br>Bid documents to be prepared | FSR Consultant - M/s Ecoprop-Meghraj<br>Bids expected to be published by 30th April 2017     |
| 23 | Narsinghpur | 15 | 556 | Compost | FSR Prepared.<br>Bid documents to be prepared | FSR Consultant - M/s Ecoprop-Meghraj<br>Bids expected to be published by 30th April 2017     |
| 24 | Pithampur   | 24 | 241 | Compost | FSR Prepared.<br>Bid documents to be prepared | FSR Consultant - M/s Ecoprop-Meghraj<br>Bids expected to be published by 30th April 2017     |

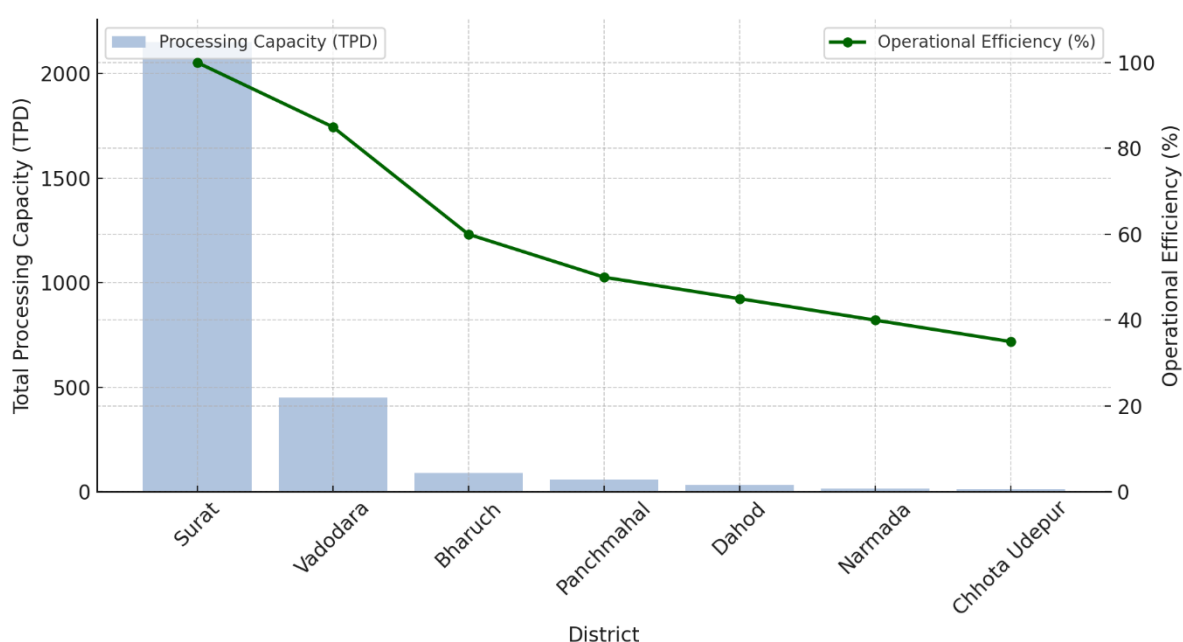
## District-Level Facility Status for Lower Narmada Basin (as of Jan 2024)

*Table 29 Status of composting, biomethanation, and waste-to-energy facilities in Lower Narmada Basin ULBs (as of Jan 2024).*

| District                   | Facility Type                                | Capacity (TPD)            | Operational Status (Jan 2024) | Remarks / Source                                                                         |
|----------------------------|----------------------------------------------|---------------------------|-------------------------------|------------------------------------------------------------------------------------------|
| Surat                      | Composting, Biomethanation, RDF, WtE         | 1,150 (Wet), 1,000 (WtE)  | Fully Operational             | Integrated facility at Khajod; 100% waste processed scientifically. (SMC, 2024)          |
| Vadodara                   | Composting, Biomethanation, RDF (Pilot)      | 400 (Wet), 50 (RDF)       | Partially Operational         | Composting + biomethanation at Moti Baug and Kapurai; RDF pilot under trial. (VMC, 2024) |
| Bharuch                    | Composting, (Planned), processing            | RDF 55 (Wet), Co-35 (Dry) | DPR Prepared                  | Cluster RDF/WtE project in design; small composting functional. (GPCB, 2023–24)          |
| Panchmahal (Godhra, Halol) | Composting, composting                       | Co-58 (Wet)               | Operational                   | Market-waste composting in Godhra; RDF linkages under study. (GPCB RO Vadodara, 2024)    |
| Dahod                      | Community Composting, Biomethanation (Pilot) | 33 (Wet)                  | Limited Operations            | Pilot biogas plants; decentralized composters. (GPCB, 2023–24)                           |
| Narmada (Rajpipla)         | Pit/Vermi Composting                         | 15 (Wet)                  | Functional (Small Scale)      | Manual composting; DPR for biomethanation                                                |

| District             | Facility Type  | Capacity (TPD) | Operational Status (Jan 2024) | Remarks / Source                                                                          |
|----------------------|----------------|----------------|-------------------------------|-------------------------------------------------------------------------------------------|
|                      |                |                |                               | pending. ( <i>Rajpipla ULB, 2024</i> )                                                    |
| <b>Chhota Udepur</b> | Pit Composting | 12 (Wet)       | Functional (Small Scale)      | Decentralized composting in core wards; limited infrastructure. ( <i>ULB Data, 2024</i> ) |

\*(Sources: GPCB Monthly Progress Reports 2023–24; CPCB SWM Annual Report 2023; Surat & Vadodara Municipal Reports 2024; ULB DPRs.)



**Figure 15 Status of Waste-to-Energy and Composting Facilities in Lower Narmada Basin (Jan 2024)**

\*(Source: GPCB MPR 2023–24; CPCB SWM Annual Report 2023; Surat & Vadodara Municipal Data)

This figure can compare total processing capacity (TPD) of “Composting + Biomethanation + WtE” across districts — showing Surat and Vadodara as fully operational leaders, followed by Bharuch and Panchmahal (developing), and smaller towns (Dahod, Narmada, Chhota Udepur) at early stages.

## 4.5.6 Successful Models of Solid Waste Management (Case Studies)

### 4.5.6.1 Solid Waste Management Initiatives in Narmada Basin Cities

Cities located within the Narmada River Basin have emerged as frontrunners in sustainable solid waste management (SWM) through innovative practices, decentralized models, and technology-driven systems as depicted in **Table 30**. These initiatives not only address urban waste challenges but also contribute to safeguarding the ecological health of the Narmada Basin.

Indore has established itself as the national benchmark in SWM by achieving 100% door-to-door collection, six-way segregation at source, and scientific processing through bio-CNG and composting plants. The city has also completed dumpsite reclamation and integrated GPS-based logistics for efficiency. Indore's recognition as India's Cleanest City for seven consecutive years (2017–2023) reflects its replicable model, which is now being adopted nationally and globally. Jabalpur has pioneered waste-to-energy generation (11.5 MW), alongside integrated landfill management, composting, and Material Recovery Facilities (MRFs). Its success in energy recovery has earned it a place among India's best SWM practices, providing a scalable solution for medium-sized cities.

Bhopal, the state capital within the basin, focuses on compost pelletization and decentralized organic waste recycling, reducing dependence on centralized dumping. The city has achieved a five-star Garbage-Free rating and reclaimed major dumpsites, reinforcing its sustainable urban waste approach. Sagar has implemented a cluster-based SWM model with decentralized composting and landfill improvement. Its approach has been highlighted at the CII Waste Exchange as a replicable cluster success story, demonstrating effective resource utilization across multiple towns. Dindori and Mandsaur have adopted compost pelletization and localized organic waste recycling systems, fostering the growth of a regional compost market. These practices not only reduce landfill pressure but also promote circular economic linkages in agriculture using organic soil conditioners.

The **Lower Narmada Basin** in Gujarat demonstrates a range of **successful and replicable models of solid waste management (SWM)**, combining innovation, public participation, and robust infrastructure.

While **Surat and Vadodara** stand out as model cities with integrated systems covering collection, segregation, processing, and energy recovery, smaller towns such as **Bharuch and**

**Panchmahal (Godhra)** are making notable progress through cluster-based and decentralized initiatives.

These examples highlight scalable approaches that align with the **Solid Waste Management Rules, 2016**, and contribute to improving the environmental health of the Narmada River Basin.

*Table 30 Solid waste management initiatives in Narmada basin cities*

| City/Location      | Model Key Features                                                                                                                                 | References                                                                                                                                       |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Indore             | 100% door-to-door waste collection, 6-way segregation at source, bio-CNG & composting plants, complete dumpsite reclamation, GPS-tracked logistics | <a href="#"><u>India's Cleanest City (2017-2023), global replication, multiple national awards</u></a><br><a href="#"><u>simcindore.mp+5</u></a> |
| Jabalpur           | Integrated landfill, waste-to-energy facility, composting units, MRFs                                                                              | <a href="#"><u>Waste-to-energy: 11.5 MW, national SWM best practice</u></a><br><a href="#"><u>abp.championsofchange+2</u></a>                    |
| Bhopal             | Compost pelletization, decentralized organic waste recycling                                                                                       | <a href="#"><u>Five-star Garbage-Free city rating, major dumpsite reclaimed</u></a><br><a href="#"><u>gov.eletsonline+1</u></a>                  |
| Sagar              | Decentralized composting, landfill improvement, cluster-based SWM                                                                                  | <a href="#"><u>Cluster success recognized by CII</u></a><br><a href="#"><u>Waste Exchange</u></a><br><a href="#"><u>ciiwasteexchange</u></a>     |
| Dindori, Mandasaur | Compost pelletization, decentralized organic waste recycling                                                                                       | <a href="#"><u>Regional compost market, decreased landfill burden</u></a><br><a href="#"><u>pelletmill+1</u></a>                                 |

\*Source: MPCB District environment plan

#### 4.5.6.2 Indore - A Model for Municipal Solid Waste Management

Indore has been recognized as the Cleanest City of India for seven consecutive years, setting a benchmark for sustainable urban solid waste management practices. The city currently generates approximately 1,192 metric tonnes (MT) of municipal solid waste (MSW) per day, which is managed through a combination of centralized and decentralized processing systems as depicted in **Table 31**.



*Table 31 Waste generation and processing mechanisms in Indore*

| S.N.         | Type of Waste                   | Quantity Generated (TPD) | Processing Mechanism | Functional Processing Capacity (TPD) |
|--------------|---------------------------------|--------------------------|----------------------|--------------------------------------|
| 1            | Wet Waste                       | 692                      | Centralized          | 550                                  |
|              |                                 |                          | Decentralized        | 205                                  |
| 2            | Dry Waste                       | 485                      | Centralized          | 400 + 200                            |
|              |                                 |                          | Decentralized        | 44                                   |
| 3            | Sanitary Waste                  | 11.5                     | Centralized          | 20                                   |
| 4            | Domestic Hazardous & E-Waste    | 3.4                      | Centralized          | 55                                   |
| 5            | Construction & Demolition (C&D) | 64.6                     | Centralized          | 100                                  |
| 6            | Landfill Residuals              | 36                       | Centralized          | 600,000                              |
| <b>Total</b> | <b>—</b>                        | <b>1,192</b>             | <b>—</b>             | <b>1,474</b>                         |

\*Source: MPCB District environment plan

Indore's waste processing capacity (1,474 TPD) exceeds its current waste generation (1,192 TPD), ensuring efficient management with surplus capacity for future growth. The city follows six-way waste segregation at source, ensuring high efficiency in recycling and recovery. Centralized and decentralized models operate in synergy, with bio-CNG, composting, MRFs, and sanitary waste processing units. Scientific landfill management and C&D waste recycling facilities significantly reduce environmental impacts.

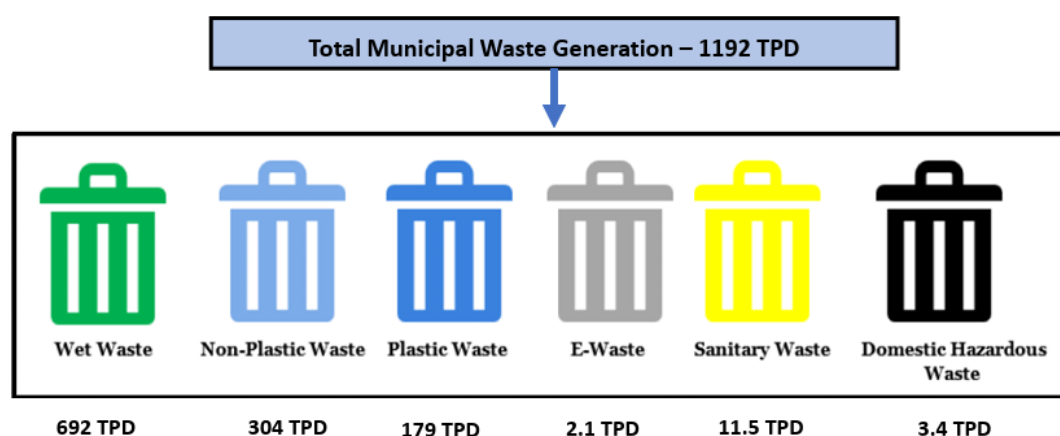
### **Waste Generation in Indore and segregation – 6 Bin Concept**

Indore has adopted an innovative 6-bin concept as shown in Fig. 16, for municipal waste segregation, enabling efficient management of the city's total daily waste generation of 1192 tons per day (TPD). This approach supports comprehensive resource recovery and safe disposal, setting a benchmark for urban waste handling in India.

- **Wet Waste (692 TPD):** Organic and biodegradable waste, such as kitchen scraps and leftovers, forms the largest fraction and is directed towards composting and biogas

production.

- **Non-Plastic Waste (304 TPD):** Dry recyclable materials like paper, cardboard, metals, and glass are collected separately, enhancing recycling outcomes.
- **Plastic Waste (179 TPD):** Segregated plastics are sent to recycling units or co-processing facilities, reducing landfill pressure and plastic pollution.
- **E-Waste (2.1 TPD):** Discarded electronics and gadgets, although a small stream, require special treatment to manage hazardous substances and recover valuable materials.
- **Sanitary Waste (11.5 TPD):** Items like diapers and sanitary products are isolated to prevent contamination of other streams and enable appropriate disposal.
- **Domestic Hazardous Waste (3.4 TPD):** Household hazardous items like paints, chemicals, batteries are separated to avoid environmental harm and support safe treatment



*Figure 16 Six bin concepts for waste generation and segregation in Indore*

Indore's 6-bin system improves recycling rates, reduces landfill burden, and minimizes environmental and health risks by ensuring that each waste category is processed via its most sustainable pathway. This practice enhances urban sustainability and can serve as a model for other Indian cities, particularly in ecologically sensitive areas such as the Narmada River Basin.

### *D2D Collection Fleet Expansion and Technological Advancement in Indore*

Indore has achieved a transformative upgrade in municipal solid waste management through D2D (Door-to-Door) Collection Fleet Expansion and Technological Advancement, ensuring 100% service coverage in all city wards with a robust, technologically integrated system as shown in **Fig. 17, 18 and 19**.

#### **Fleet Expansion and 100% Coverage**

- The city deploys a comprehensive fleet that includes:
  - 575 D2D vehicles dedicated to daily household waste collection.
  - 74 Bulk Waste vehicles for institutional and commercial establishments.
  - 8 Meat Collection vehicles for specialized organic waste streams.
  - 15 C&D (Construction & Demolition) vehicles to manage construction debris.
  - 85 Garden Waste vehicles for horticultural waste.
  - 148 Litter Bin/Road Sweeping waste vehicles to maintain street cleanliness.

This diverse and specialized vehicle fleet ensures that every type of municipal waste is collected efficiently, covering all sources and all wards without lapse.

#### **Technological Integration and Automation**

The system leverages an end-to-end automated service delivery mechanism, utilizing GIS mapping and digital command centers to route vehicles, monitor collection progress, and track operational performance in real time. Centralized control rooms oversee fleet operations, guaranteeing prompt response and continuous optimization of collection schedules and resources.

## Impact of Technological Advancement

Integrated technologies enable precision routing, high accountability, and adaptive resource allocation, reducing missed pickups and maximizing efficiency. Real-time dashboards foster transparency, data-driven decision-making, and rapid resolution of service bottlenecks.

## Innovations Enhancing Segregation

Vehicles are customized for multi-bin waste segregation (wet, dry, plastic, hazardous, sanitary, and e-waste), supporting Indore's pioneering 6-bin strategy and facilitating downstream recycling and treatment. Seamless linkage between collection and processing ensures minimal waste leakage and maximizes resource recovery across the urban landscape.

Indore's integrated fleet and smart management platform set a national benchmark, driving efficiency, accountability, and sustainability in urban waste management while protecting river basin health



*Figure 17 D2D collection fleet expansion and technological advancement*

Indore has undergone a remarkable transformation, converting its legacy dumpsite into a vibrant city forest through phased bioremediation and ecological restoration initiatives



*Figure 18 Indore bioremediation transformation into city forest (2015 to 2020)*

- Reclamation of over 100 acres land worth Rs 300 Cr.
- Transformation into City Forest – 1.50 lac trees planted



*Figure 19 Indore bioremediation transformation into city forest (2022 to present)*

#### 4.5.6.3 Dumpsite Remediation of Legacy Waste – Bhanpur Khanti (Bhopal)

Bhanpur Khanti in Bhopal exemplifies large-scale dumpsite remediation and land reclamation, showcasing effective management of legacy municipal waste and urban restoration as shown in **Fig. 20**.



### Before Remediation

The site contained around 7.23 lakh tons of legacy waste, spread across a vast 37-acre area. This unremediated dumpsite posed significant environmental and health risks due to uncontrolled dumping, leachate contamination, and air pollution.

### After Remediation

21 acres of land, valued at Rs. 85 crores, have been successfully reclaimed for productive urban use, unlocking economic and social benefits for Bhopal. 16 acres of land have been scientifically capped, preventing further soil, air, and groundwater pollution through engineered containment and restoration measures.



*Figure 20 Transformation of Bhanpur Khanti Dumpsite*

#### 4.5.6.4 Best Practice Integrated Solid Waste Management Project at Jabalpur

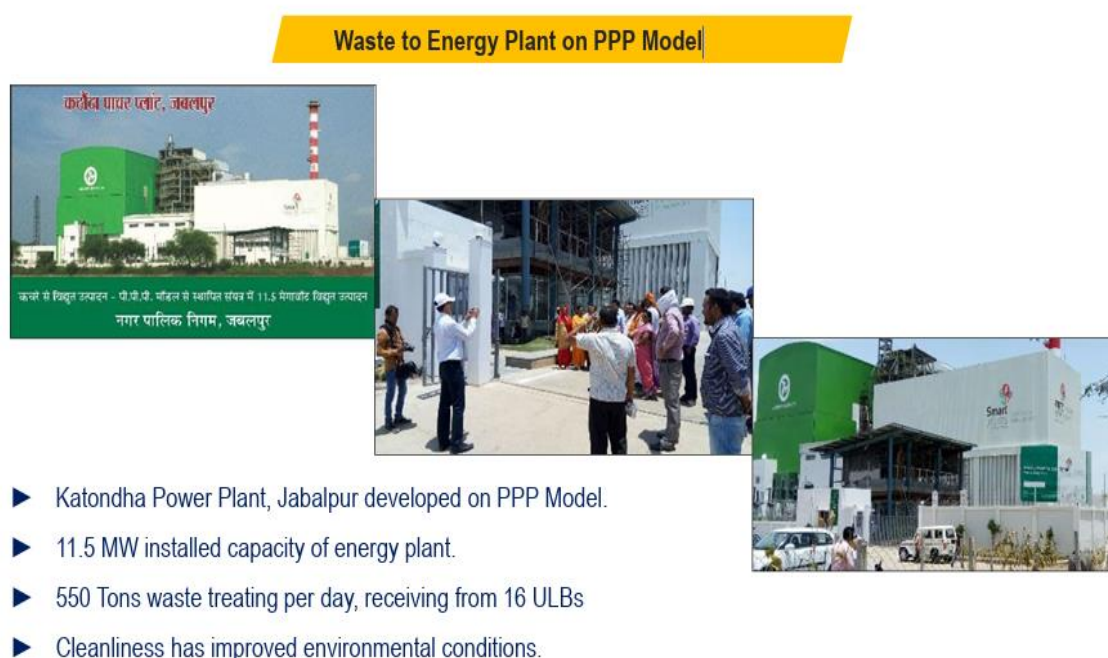
Jabalpur's integrated solid waste management system is showcased by its Waste to Energy Plant at Katonda, a benchmark initiative developed under the Public-Private Partnership (PPP) model as shown in **Fig. 21**.

## Katonda Waste to Energy Plant – Key Features

The plant boasts an installed capacity of 11.5 MW, converting municipal solid waste into electricity and significantly reducing landfill dependency. Every day, the facility processes 550 tons of municipal waste collected from 16 Urban Local Bodies (ULBs) across the region, making it a central hub for inter-city waste management. Participation in the PPP model has driven technological efficiency and financial sustainability, fostering a collaborative approach between Jabalpur Municipal Corporation and private sector expertise.

## Environmental and Social Impact

The systematic treatment and energy recovery from waste have led to enhanced urban cleanliness, helping to mitigate environmental hazards caused by unprocessed garbage and open dumping. Reduced waste volumes, improved hygiene, and organized disposal practices have collectively transformed local environmental conditions in Jabalpur and its satellite ULBs. Jabalpur's Katonda Waste to Energy project stands out as a best practice example, demonstrating the effectiveness of integrated solid waste systems and PPP models in scaling up urban sustainability and resource recovery efforts.



*Figure 21 Integrated Solid Waste Management Project at Jabalpur*

#### 4.5.6.5 Best Practice Integrated Solid Waste Management Project, Kanti Cluster

The Kanti Cluster Integrated Solid Waste Management Project represents a model of comprehensive waste management infrastructure, combining advanced processing, composting, and landfill operations to sustainably handle municipal waste across regional urban centers as shown in **Fig. 22**.

##### Waste Processing Infrastructure

- **Katni MSW Plant:** Central to the cluster, this facility is landscaped and engineered for high-volume municipal solid waste (MSW) intake, ensuring clean and organized site operations.
- **Trommel:** Automated trommel screens are used for mechanical segregation, efficiently separating recyclables, organics, and inert fractions for downstream processing.
- **Aeration Pit:** Managed pits facilitate controlled aeration of organic waste, accelerating decomposition and enhancing compost quality through aerobic microbial action.



**Figure 22** Waste Processing Plant & Scientific Landfill of Integrated Solid Waste Management, Kanti cluster



### Specialized Treatment Facilities

- Composting: Organic fractions are converted into nutrient-rich compost, supporting soil health and local agriculture while diverting biodegradable waste from landfills.
- Animal Carcass Incinerator: Dedicated incinerators safely process animal remains, minimizing biohazard and odour risks for the surrounding community.

### Scientific Landfill Operations

- Scientific Landfill: Residual inert and non-recyclable wastes are securely contained in engineered landfills, with layers and leachate management systems that shield soil and groundwater from contamination, ensuring compliance with environmental norms

### 4.5.6.6 Best Practice - Integrated Solid Waste Management Project – Sagar Cluster

The Sagar Cluster Integrated Solid Waste Management Project showcases an exemplary model of regional waste processing as shown in **Fig. 23**, combining mechanized segregation and scientific landfill solutions to address municipal solid waste challenges comprehensively.

#### Waste Processing Plant Components



**Figure 23 Waste Processing Plant & Scientific Landfill photos of Integrated Solid Waste Management, Sagar cluster**

### **Sagar MSW Plant Overview & Entry:**

The project features a well-structured campus with modern access and secure perimeter, facilitating organized intake and processing of municipal waste from surrounding areas. The main plant building and expansive shed support scalable operations, sheltering advanced processing equipment and ensuring all-weather handling of waste materials.

### **Mechanized Segregation**

**Trommel:** Automated trommel machinery is deployed for bulk mechanical separation, sorting recyclables and compostable fractions from incoming waste with high efficiency.

**Waste Pit:** Carefully engineered waste pits ensure safe temporary storage and pre-processing before onward movement to treatment or disposal units.

## **4.5.6.7 Surat – A Model for Integrated Waste Management**

### **Background:**

Surat Municipal Corporation (SMC) has emerged as one of India's leading ULBs in solid waste management, maintaining 100% door-to-door collection, segregation, processing, and scientific disposal. The city's integrated system supports daily handling of **over 2,100 TPD** of municipal solid waste.

### **Key Features:**

- **100% Door-to-Door Collection:** GPS-tracked, covered vehicles operate across all 100 wards.
- **Segregation at Source:** Maintained at **>95 %**, facilitated through community awareness and enforcement drives.
- **Wet Waste Processing:**
  - **Composting & Biomethanation Units (1,150 TPD)** producing compost and biogas.
  - **Refuse-Derived Fuel (RDF) and WtE Facility (1,000 TPD)** operational at Khajod.
- **Scientific Landfill:** Legacy waste fully remediated; reclaimed land redeveloped into the **Integrated Solid Waste Management Complex**.

- **Public–Private Partnership (PPP):** The WtE plant, operated by Abellon Clean Energy, generates electricity supplied to the local grid.
- **Digital Monitoring:** Integrated MIS dashboard monitors vehicle routes, waste tonnage, and plant performance in real time.

**Impact:**

- Zero open dumping or burning within city limits.
- Over **90 % diversion from landfill**, positioning Surat as a **Zero Waste City**.
- Model replication initiated by other ULBs through the Gujarat Urban Development Department.

**Source:** Surat Municipal Corporation (SMC), GPCB MPR 2023–24, CPCB SWM Annual Report 2023.

#### 4.5.6.8 Vadodara – Integration of Composting, Biomethanation, and RDF

**Background:**

The **Bharuch-Ankleshwar** urban cluster, part of the Lower Narmada Basin, generates approximately **90–100 TPD** of waste. Given the proximity of industrial areas and cement plants, Bharuch has adopted a **cluster-based approach** to waste processing and disposal.

**Key Features:**

- **Composting and RDF Planning:**
  - DPR prepared for **cluster-level RDF-based Waste-to-Energy facility** serving Bharuch, Ankleshwar, and nearby towns.
- **Segregation Improvements:**
  - ULB-level initiatives increased segregation to **~70 %** through awareness campaigns.
- **Co-Processing:**
  - Non-recyclable waste supplied to **Ambuja Cement (Kodinar)** for RDF utilization.
- **Legacy Waste Remediation:**
  - **60 %** of old dumpsite remediated by early 2024 under GPCB monitoring.

**Impact:**

- Reduction in open dumping and improved waste utilization.
- Demonstration of effective industrial–municipal cooperation for RDF usage.
- Serves as a **replicable model for small industrial towns** in the basin.

**Source:** GPCB RO Bharuch Reports 2023–24; CPCB SWM Annual Report 2023.

#### **4.5.8.9 Panchmahal (Godhra) – Decentralized and Market Waste Composting**

##### **Background:**

The Panchmahal district (notably **Godhra and Halol**) generates about **105 TPD** of waste, with organic waste comprising over 50 %. The district’s ULBs have implemented decentralized composting and market-waste management programs.

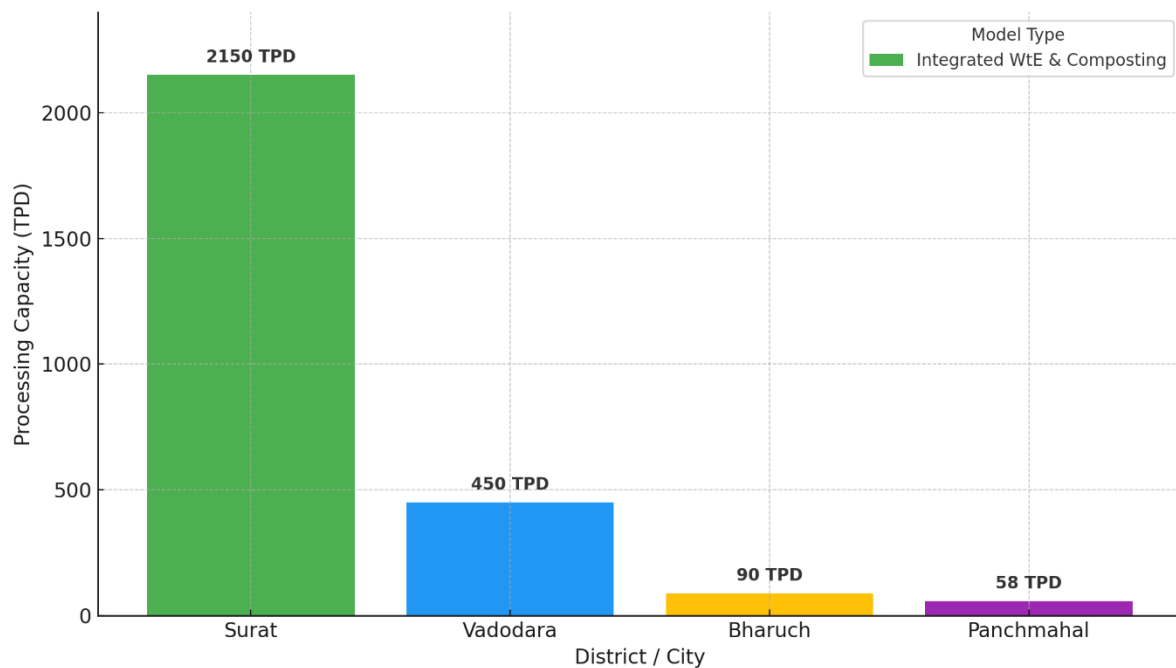
##### **Key Features:**

- **Decentralized Composting:** Ward-level composting units and market compost pits operational.
- **Segregation Drives:** Conducted in schools and residential areas with community engagement.
- **Co-Composting:** Integration of organic waste and sewage sludge under pilot initiatives.
- **ULB Partnerships:** Support from GPCB and SBM(U) for technical guidance and equipment supply.

##### **Impact:**

- Reduced waste transportation costs by treating waste at source.
- Improved compost utilization in local agriculture and municipal landscaping.
- Enhanced citizen participation in waste segregation and composting.

**Source:** GPCB RO Vadodara, Panchmahal ULB DPRs, 2023–24.



**Figure 24 Successful Solid Waste Management Models in Lower Narmada Basin (Gujarat).**

**\*Source:** Gujarat Pollution Control Board (GPCB) MPR 2023–24; CPCB SWM Annual Report 2023; Surat, Vadodara, Bharuch, and Panchmahal ULB Reports 2024

This figure can summarize key model types (Integrated, Cluster-Based, and Decentralized) with their respective districts — Surat (Integrated WtE), Vadodara (Biomethanation + RDF), Bharuch (Cluster RDF), Panchmahal (Decentralized Composting).

## 5. Wastewater Treatment Facilities

### 5.1 Sewage Treatment Plants (STPs)

#### 5.1.1 Operational Sewage Treatment Plants

The Narmada River Basin districts collectively operate a limited number of sewage treatment plants (STPs), with wide variations in installed capacity which is depicted in **Table 32**. The highest coverage is observed in Jabalpur, which has 11 operational STPs with a cumulative capacity of 154.15 MLD, reflecting its large urban population and central role as a basin city. Other districts with moderate treatment capacity include Dewas (38 MLD across 3 plants), Burhanpur (24 MLD across 2 plants), and Dhar (12 MLD with 1 plant). Smaller districts such as Sehore (15.28 MLD across 3 STPs), Khandwa (17.95 MLD across 2 STPs), and Khargone (17.6 MLD with 1 STP) provide localized coverage but at much lower scales. Meanwhile, rural and semi-urban districts like Anuppur (1.2 MLD), Dindori (3.85 MLD), Mandla (10 MLD), and Narsinghpur (9 MLD) operate only single or dual units, with very limited treatment capacity compared to wastewater generation.

Overall, the existing treatment infrastructure is concentrated in a few urban centers, leaving large portions of the basin underserved. This uneven distribution underscores the urgent need for capacity augmentation, operational efficiency improvements, and expansion of decentralized wastewater treatment systems. For detailed information on STP locations, average utilization, and wastewater reuse practices, refer to **Annexure Table A16**.

*Table 32 Operational Sewage Treatment Plants in the Narmada River Basin*

| Districts | Number of Operational STPs | Cumulative Capacity (MLD) |
|-----------|----------------------------|---------------------------|
| Anuppur   | 1                          | 1.2                       |
| Burhanpur | 2                          | 24                        |
| Dewas     | 3                          | 38                        |
| Dhar      | 1                          | 12                        |
| Dindori   | 1                          | 3.85                      |

|               |    |        |
|---------------|----|--------|
| Jabalpur      | 11 | 154.15 |
| Khandwa       | 2  | 17.95  |
| Khargone      | 1  | 17.6   |
| Mandla        | 1  | 10     |
| Narsinghpur   | 2  | 9      |
| Sehore        | 3  | 15.28  |
| Bharuch       | 1  | 29.3   |
| Narmada       | 1  | 5.5    |
| Chhota udepur | 1  | 5      |

*\*Source: Government of Madhya Pradesh. (2024). Action taken report in OA No. 606 of 2018 (Compliance of MSW Management Rules, 2016 and other environmental issues). National Green Tribunal.*

The Lower Narmada basin contains a mix of municipal and institutional STPs serving urban centres, industrial townships and tourist facilities. Rajpipla is served by a 5.5 MLD SBR-based STP located near Chitrawadi (commissioned 2024 under GWSSB) and treats sewage from the town's partially developed network with some reuse for non-potable purposes. Ankleshwar GIDC has a dedicated 22.5 MLD STP serving the industrial estate. Chhotaudepur operates a 5.0 MLD STP (conveyance constrained by rising-main problems) adequate for the town's ~4.0 MLD sewage generation. Bharuch city has an integrated sewerage system divided into five zones with an ultimate STP capacity of 29.3 MLD, fed by ~118 km of pipelines, 5,910 manholes and 166 vertical drops. Smaller institutional STPs include the 500 KLD STP at Ekta Nagar (Kevadia township) and a ~400 KLD STP at the Sardar Patel Zoological Park (Jungle Safari). Rural areas in the lower basin lack centralized STP coverage and rely predominantly on on-site systems (septic tanks and leaching pits).

### **5.1.2 Treatment Technologies Adopted in STPs & Treated Effluent Quality Parameters**

STPs in the Narmada River Basin use varied technologies, with SBR (15 plants) being the most common due to its high efficiency and compact footprint, though it requires skilled operation.

Phytorid systems (7 plants) provide a low-energy, eco-friendly option suitable for decentralized setups, while oxidation ponds (2 plants) are simple and low-cost but land-intensive. A single unit applies Devorts electrochemical technology, mainly for industrial wastewater. For 5 STPs, technology details are unavailable, reflecting reporting gaps. Overall, SBR dominates in urban centers, while Phytorid and oxidation ponds serve smaller towns as depicted in **Table 33**.

*Table 33 Wastewater treatment technologies adopted in STPs*

| <b>Technology</b>                 | <b>No. of STPs based<br/>in this technology</b> | <b>Procedure</b>                                                                                                                    | <b>Features</b>                                                                                    |
|-----------------------------------|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| SBR (Sequential<br>Batch Reactor) | 15                                              | Operates in cycles: Fill, react (aeration), Settle, Decant, and Idle. Treats wastewater in batches with aeration and sedimentation. | Batch process; high efficiency; small footprint; requires skilled operation.                       |
| Oxidation Pond                    | 2                                               | Large shallow basins where sunlight, algae, and microorganisms work together to degrade organic matter.                             | Simple, low-cost, effective in sunny climates; requires a large land area.                         |
| Phytorid                          | 7                                               | Constructed wetland system using specific aquatic plants and soil media to naturally treat wastewater.                              | Eco-friendly; low energy; enhances biodiversity; suitable for decentralized systems.               |
| Devorts                           | 1                                               | Uses electrolysis or electrochemical methods for pollutant removal, often in industrial wastewater.                                 | Chemical-free; high removal efficiency for specific pollutants; cost-effective for industrial use. |
| Not Available                     | 5                                               | Not applicable                                                                                                                      | Not applicable                                                                                     |

*\* Source: Hon'ble National Green Tribunal Principal Bench. (2024, March 14). Order no. 606/2018*



Measured effluent quality where data is available shows effective treatment performance for several plants. In **Rajpipla**, the influent sewage reaching the STP(5.5 MLD SBR) shows variable and at times high pollutant loads, with BOD ranging from 24 to 138 mg/L, COD up to 435 mg/L, TSS(Total Suspended Solids) often exceeding 370 mg/L, and Total Nitrogen between 10 and 16 mg/L, with pH slightly acidic at 5.8–6.1. The treated effluent consistently complies with standards, with BOD reduced to less than 6.5 mg/L, COD to under 20 mg/L, and TSS below 10 mg/L. Nutrient removal is effective, with Total Nitrogen around 6 mg/L, NH<sub>4</sub>-N less than 3.6 mg/L, and phosphorus at 0.8 mg/L. Pathogen removal is also significant, with fecal coliforms reduced to 70 MPN/100 ml, pH stabilized around 7.1–7.5, and residual chlorine maintained between 0.3 and 0.9 mg/L.

Bharuch's STP system with Sequential batch Reactor (SBR) uses automated dosing and ORP/DO-based disinfection and monitoring. The outlet water sample from the Bharuch city STP test result shows that the pH of the water is 8.26, which is within the normal range. The BOD is 17 mg/L and COD is 51 mg/L, which means some organic matter is still present. Fecal coliform count is 920 MPN/100ml, showing that bacteria are present in the treated water. Suspended solids are low at 8 mg/L. The nutrients measured were 1.89 mg/L of total nitrogen and 0.138 mg/L of total phosphate. Overall, the STP is reducing pollution load, but the presence of coliform and BOD indicates the water still needs care before reuse or safe discharge.

Sludge generated by municipal STPs in the lower basin is handled using conventional thickening and dewatering processes. Rajpipla, Chhota udepur and Bharuch plants employ sludge thickening and dewatering (Bharuch also uses centrifugation) with subsequent safe disposal.

### **5.1.3 Under-Construction STPs**

Several sewage treatment plants (STPs) are under construction across the Narmada River Basin, indicating ongoing efforts to bridge the gap between sewage generation and treatment. The largest upcoming capacity is in Hoshangabad (21 MLD), followed by Barwani (20.3 MLD across 4 units) and Khargone (15.99 MLD across 4 units), which together represent major capacity additions in the basin. Districts such as Mandla (9.5 MLD), Jabalpur (8.8 MLD), and Jhabua (8 MLD) also show significant expansions. Smaller-scale plants are being developed in Alirajpur (3.5 MLD), Dhar (11.18 MLD), and Sehore (5.2 MLD), while rural or semi-urban districts like Betul, Burhanpur, Seoni, and Narsinghpur are constructing plants of less than 2 MLD each (**Table 34**).

Overall, under-construction STPs add a cumulative capacity of over 100 MLD, which will substantially improve wastewater treatment once commissioned. However, the progress of construction, scheme-wise funding details, and expected completion timelines vary widely as shown in **Table 26**. For location-specific data, physical progress, reuse provisions, and scheme details, refer to **Annexure Table A17**.

**Table 34 Under construction Sewage Treatment Plants in the Narmada River Basin**

| <b>District</b> | <b>Number of Under Construction STPs</b> | <b>Cummulative Capacity (MLD)</b> |
|-----------------|------------------------------------------|-----------------------------------|
| Alirajpur       | 2                                        | 3.5                               |
| Balaghat        | 1                                        | 1.5                               |
| Barwani         | 4                                        | 20.3                              |
| Betul           | 2                                        | 1.6                               |
| Burhanpur       | 2                                        | 1.7                               |
| Chhindwara      | 1                                        | 3                                 |
| Dhar            | 2                                        | 11.18                             |
| Hoshangabad     | 1                                        | 21                                |
| Jabalpur        | 2                                        | 8.8                               |
| Jhabua          | 2                                        | 8                                 |
| Khargone        | 4                                        | 15.99                             |
| Mandla          | 2                                        | 9.5                               |
| Narsinghpur     | 1                                        | 1                                 |
| Raisen          | 1                                        | 2.7                               |
| Seoni           | 1                                        | 1                                 |

|         |   |     |
|---------|---|-----|
| Sehore  | 2 | 5.2 |
| Bharuch | 1 | 14  |

*\*Source: Government of Madhya Pradesh. (2024). Action taken report in OA No. 606 of 2018 (Compliance of MSW Management Rules, 2016 and other environmental issues). National Green Tribunal.*

Ankleshwar has a municipal 14 MLD STP that receives sewage from an extensive underground drainage network of 146 km length. 90% work has been completed and it will be ready by 31 December 2025.

## 5.2 Common Effluent Treatment Plants (CETPs) and Final Effluent Treatment Plant (FETPs)

The Narmada River Basin is supported by a limited number of Common Effluent Treatment Plants (CETPs) given in **table 35**. They are designed to handle industrial wastewater collectively from small and medium enterprises. At present, there are three operational CETPs with a cumulative capacity of 9.1 MLD, along with two additional CETPs under construction/proposed with a combined capacity of 0.6 MLD.

Overall, while the running CETPs are functional and compliant, their scale is relatively modest compared to the growing industrial effluent load in the basin. With increasing industrialization in clusters such as Pithampur, Mandideep, and Sanwer Road, there is a pressing need to expand CETP capacity, ensure regular monitoring, and promote Zero Liquid Discharge (ZLD) practices to minimize untreated effluent discharge into the Narmada and its tributaries.

*Table 35 Status of CETPs in the Narmada River Basin*

| Town / Location         | No. of Industries | Industrial Discharge (MLD) | Status of ETPs | Status of CETPs | Capacity (MLD) |
|-------------------------|-------------------|----------------------------|----------------|-----------------|----------------|
| Govindpura              |                   |                            |                |                 |                |
| Industrial Area, Bhopal | 26                | ~0.2                       | Running        | Existing        | 0.2            |

|            |     |      |         |              |     |
|------------|-----|------|---------|--------------|-----|
| Sanwer     |     |      |         |              |     |
| Road,      | 168 | ~4.0 | Running | Existing     | 4   |
| Indore     |     |      |         |              |     |
| Burhanpur  | 51  | ~4.5 | Running | Existing     | 4.5 |
| Meghnagar, | -   | -    | -       | Existing     | 0.4 |
| Jhabua     |     |      |         |              |     |
| Rangwasa,  | -   | -    | -       | Under        | 0.2 |
| Indore     |     |      |         | Construction |     |

*Source: Government of Madhya Pradesh. (2023, October). National Mission for Clean Ganga: Monthly Progress Report in NGT Case No. 673 of 2018 (in compliance to NGT order dated 24.09.2020).*

The lower Narmada basin's industrial clusters are served by several CETPs/FETPs of varying capacities and by a regional deep-sea disposal network given in **table 36**. Ankleshwar GIDC operates a CETP (Enviro Technology Ltd.) whose capacity has been increased from 1.8 MLD to 2.2 MLD and discharges treated effluent to the sea via underground pipeline. Panoli GIDC hosts a CETP (Panoli Enviro Technology Ltd.) with planned upgradation from 2.04 MLD to 2.664 MLD, with deep-sea disposal. Dahej GIDC has a 40 MLD CETP proposed and is linked to a regional submarine disposal arrangement; the GIDC has developed a 90 MLD wastewater collection and disposal pipeline that connects Vilayat pumping station to Dahej for deep-sea discharge. The Vilayat area is explicitly connected to the 90 MLD collection/disposal scheme serving Dahej/PCPIR. Jhagadia GIDC is served by a FETP (Narmada Clean Tech) with an effluent handling cap not to exceed 35 MLD, discharging via underground pipeline to marine disposal. Bharuch GIDC (Saykha) is estimated to host a 40 MLD CETP linked into the same 90 MLD pipeline network. GIDC's 90 MLD disposal pipeline has an overall length of about 40 km from Vilayat pumping station to Dahej, and includes onshore and offshore sections from the Dahej final pumping station in deep sea. For parts of Narmada district such as Rajpipla and Tilakwada GIDCs, no common CETP capacity data is available in the supplied dataset and industries in these areas are understood to operate individual ETPs (Effluent Treatment Plant).

*Table 36 Industrial clusters and CETP in lower Narmada basin gujarat*

| <b>Industrial Cluster / Area</b> | <b>CETP / FETP Operator</b>   | <b>Capacity (MLD)</b> | <b>Disposal Method / Notes</b>                                              |
|----------------------------------|-------------------------------|-----------------------|-----------------------------------------------------------------------------|
| <b>Ankleshwar GIDC</b>           | Enviro Technology Ltd.        | 2.2                   | Discharges via underground pipeline to sea; capacity increased from 1.8 MLD |
| <b>Panoli GIDC</b>               | Panoli Enviro Technology Ltd. | 2.04                  | Deep-sea disposal                                                           |
| <b>Dahej GIDC</b>                | GIDC                          | 40 (proposed)         | Linked to 90 MLD wastewater collection and deep-sea disposal pipeline       |
| <b>Vilayat Area</b>              | GIDC                          | Linked to 90 MLD      | Part of 90 MLD collection/disposal scheme serving Dahej/PCPIR               |
| <b>Jhagadia GIDC</b>             | Narmada Clean Tech (FETP)     | 35                    | Effluent via underground pipeline to marine disposal                        |
| <b>Bharuch GIDC (Saykha)</b>     | GIDC                          | 40 (estimated)        | Linked to same 90 MLD deep-sea disposal pipeline                            |

*Source: EC compliance for the period of Apr22 to Sep22 ETL and dahej effluent infrastructure and pre-feasibility report for proposed expansion of existing common effluent treatment plant (cetp) operated by m/s. panoli enviro technology ltd. (petl) (common effluent treatment plant)*

Sludge and solid residuals from CETPs/FETPs in the lower basin are dewatered and managed through authorized hazardous-waste facilities. **M/s. Bharuch Enviro Infrastructure Ltd. (BEIL)** with facilities in both **GIDC Ankleshwar** and **GIDC Dahej**, and **M/s. Shesh Enviro Infra Pvt. Ltd.** at **Saykha** (Dahej–Vagra belt). CETP/FETP sludge is typically dewatered on-site and transported to these TSDF facilities for final disposal. In addition, common biomedical waste handling in the region is supported by facilities such as **Globe Biocare (Plot No.144/B, GIDC Ankleshwar)**. For industries in locations without common CETPs (e.g., Rajpipla, Tilakwada), individual ETP sludges are handled locally and dispatched to authorized disposal sites as per the operating company arrangements.

## 6. Solid and Hazardous Waste Disposal

### 6.1 Hazardous waste

#### 6.1.1 Hazardous Waste Generation

Hazardous waste generation in the Narmada River Basin is concentrated in a few industrially active districts. Dhar (29,210.15 MT/annum), Sehore (9,335.93 MT/annum), Sagar (6,322.21 MT/annum), Dewas (6,597.18 MT/annum), and Indore (5,724.57 MT/annum) are the major contributors, reflecting their dense industrial presence. Significant recyclable or utilizable fractions are reported from Dhar (21,144.57 MT), Dewas (4,931.36 MT), and Sagar (over 5,800 MT), highlighting strong recovery potential.

Smaller volumes are observed in districts like Betul (32.33 MT), Harda (136.40 MT), and Umaria (32.48 MT), while some tribal-dominated areas, such as Dindori, report negligible or no hazardous waste. A few districts, including Burhanpur (4,503.9 MT) and Khargone (2,701.4 MT), show large utilizable fractions, indicating scope for resource recovery through co-processing or industrial reuse.

Overall, hazardous waste generation as shown in **Table 37** is unevenly distributed, with industrial hubs accounting for most of the load. Strengthening recycling and utilization pathways, along with strict compliance with TSDF and co-processing norms, will be essential to minimize environmental risks.

*Table 37 Hazardous Waste Generation in the Narmada River Basin*

| Districts | Quantity of HW in the district<br>(MT/Annum) | Quantity of Recyclable/utilizable<br>HW (MT/Annum) |
|-----------|----------------------------------------------|----------------------------------------------------|
| Alirajpur | 0.05                                         | Recyclable – 0.05                                  |
| Anuppur*  | 604.27                                       | Recyclable – 35.89, Utilizable -<br>565.07         |
| Balaghat  | 37.47                                        | Recyclable – 37.47                                 |
| Barwani   | 314.26                                       | Recyclable- 35.92, Utilizable-<br>152.86           |

|             |           |                                             |
|-------------|-----------|---------------------------------------------|
| Betul       | 32.33     | Recyclable-21.01, Utilizable-1.54           |
| Burhanpur   | 4503.9    | Recyclable- 0.11, Utilizable-<br>4478.00    |
| Chindwara   | 1186      | Recyclable – 154                            |
| Damoh       | 42.64     | Recyclable – 42.64                          |
| Dewas       | 6597.18   | Recyclable – 4931.36                        |
| Dhar        | 29,210.15 | Recyclable – 21,144.57                      |
| Dindori     | 0         | 0                                           |
| Harda       | 136.404   | Recyclable-0.9421, Utilizable0.135          |
| Hosangabad  | 66.89     | Recyclable – 43.30, Utilizable –<br>19.98   |
| Indore      | 5724.57   | -                                           |
| Jabalpur    | 2566.19   | Recyclable –2466.38                         |
| Jhabua      | 1184.53   | Recyclable- 960.55, Utilizable-<br>100.91   |
| Katni       | 101.8     | Recyclable- 101.51, Utilizable- 0           |
| Khandwa     | 62.93     | Recyclable- 30.67, Utilizable- 0.00         |
| Khargone    | 2701.4    | Recyclable- 1059.20, Utilizable-<br>1155.90 |
| Mandla      | 10.967    | Recyclable – 0.86                           |
| Narshingpur | 262.62    | Recyclable – 10.18                          |
| Raisen      | 5711.8    | Recyclable – 119.05                         |

|        |         |                                           |
|--------|---------|-------------------------------------------|
| Sagar  | 6322.21 | Recyclable – 304.08, Utilizable – 5805.10 |
| Sehore | 9335.93 | Recyclable-350.03, Utilizable HW- 5.14    |
| Seoni  | 0       | Recyclable – 8.25                         |
| Umaria | 32.48   | Recyclable -17.22                         |

*\*All the data filled according to the basin Portion.*

*Source: Madhya Pradesh Pollution Control Board. (2025). District Environment Plans*

Bharuch district is one of the biggest hazardous waste-producing areas in Gujarat. About 2,380 industries in the district generate nearly 12,53,485 metric tons of hazardous waste every year. Out of this, around 1,04,525 MT/year is incinerable, 5,92,019 MT/year is landfillable, and 5,56,941 MT/year is recyclable or usable again. Ankleshwar, being a large industrial area, produces a major part of this waste. In Narmada district (Rajpipla), 18 industries generate about 312 MT/year of hazardous waste, of which 269.70 MT/year is incinerable and 42.303 MT/year is landfillable, with no recyclable waste. In Chhota Udepur district, 19 industries produce around 11.095 MT/year of hazardous waste, including 0.11 MT/year incinerable, 14.51 MT/year landfillable, and 953.352 MT/year recyclable or reusable waste. As below table shows the hazardous waste in lower basin.

*Table 38 Hazardous waste generated in lower basin*

| District             | No. of Industries | Total Waste (MT/year) | Incinerable (MT/year) | Landfillable (MT/year) | Recyclable/Utilizable (MT/year) |
|----------------------|-------------------|-----------------------|-----------------------|------------------------|---------------------------------|
| <b>Bharuch</b>       | 2,380             | 12,53,485             | 1,04,525              | 5,92,019               | 5,56,941                        |
| <b>Narmada</b>       | 18                | 312                   | 269.70                | 42.303                 | 0                               |
| <b>Chhota Udepur</b> | 19                | 11.095                | 0.11                  | 14.51                  | 953.352                         |

*\*Source: GPCB District environment plan*

### 6.1.2. Hazardous Waste Management

Hazardous waste management in the Narmada Basin is primarily facilitated through the **Treatment, Storage and Disposal Facility (TSDF) located in Dhar district**, which caters to



most of the basin districts. The district-level review identified from District Environmental Plans, presented in **Annexure Table A11**, highlights both progress and existing gaps.

A number of districts such as **Betul, Dindori, Chhindwara, Dewas, Dhar, Jabalpur, Mandla, Narsinghpur, Raisen, Sehore, and Seoni** have established collection centers and are effectively linked to the Dhar TSDF, with minimal or no gaps reported. In these districts, hazardous waste management is operational, and institutional mechanisms are relatively strong.

On the other hand, several districts including **Anuppur, Barwani, Burhanpur, Damoh, Hoshangabad (Narmadapuram), Jhabua, Katni, Umaria, and West Nimar** lack dedicated collection centres. The District Environmental Plans (DEPs) for these regions identify the urgent need to establish proper collection facilities and strengthen linkages with TSDF Dhar. In some districts such as **Damoh and Hoshangabad**, it is specifically recommended that Urban Local Bodies (ULBs) be integrated into the TSDF network to ensure compliance with hazardous waste rules.

In a few cases, hazardous waste generation has been assessed, such as in **Balaghat and Sagar**, reflecting either low industrial activity or minimal hazardous waste generation in those districts. However, continuous monitoring and preparedness are emphasized to manage future risks.

Common challenges noted across the basin include the **need for training and capacity-building of personnel**, provision of adequate protective equipment, and improved awareness of safe handling practices. While the Dhar TSDF provides a central facility for disposal, the absence of decentralized collection and pre-treatment infrastructure in many districts poses a risk of improper handling at local levels.

Thus, while progress has been made in select districts, hazardous waste management in the Narmada Basin remains uneven. Strengthening collection networks, capacity building, and ensuring effective TSDF linkages across all districts are critical steps for a more robust and compliant hazardous waste management framework.

Bharuch district has strong systems for handling hazardous waste. The district has 3 Treatment, Storage, and Disposal Facilities (TSDFs) and 6 Secured Landfill Sites (SLFs). No contaminated sites have been found so far. In Ankleshwar, industries have their own storage areas and are connected with TSDFs through the Gujarat Pollution Control Board's online

XGN system. Workers receive regular training, and compliance is strictly checked to ensure proper waste disposal.

In Narmada district, there are no TSDFs, so hazardous waste from 18 industries is sent to other districts for safe disposal. A new Material Recovery Facility (MRF) is planned for domestic hazardous waste management by December 2022, and worker training is also planned by that time. In Chhota Udepur district, industries are linked to state-level TSDFs through the XGN system. Although the district has no local disposal site, all waste is properly handled and sent to authorized facilities. No contaminated sites have been reported in the area.

## 6.2 Biomedical waste

### 6.2.1. Biomedical Waste Generation

Biomedical waste generation in the Narmada River Basin as shown in **Table 39** is highest in Jabalpur (1,899 kg/day), followed by Khargone (368.97 kg/day), Khandwa (297.47 kg/day), and Dewas (273.33 kg/day), where treatment facilities manage the full load. Most districts show near-complete treatment, reflecting adequate capacity. However, Burhanpur is a major concern, generating 260.62 kg/day but treating only 3.62 kg/day, indicating critical infrastructure and compliance gaps. Smaller districts like Dindori (52 kg/day) and Harda (85 kg/day) generate less waste, all fully treated. Overall, while most areas show satisfactory performance, isolated deficits highlight the need for stricter monitoring and expanded treatment facilities.

Overall, while most districts demonstrate adequate biomedical waste treatment capacity, isolated cases of non-compliance highlight the urgent need for capacity enhancement, strict monitoring, and improved coordination between healthcare institutions and authorized Common Biomedical Waste Treatment Facilities (CBWTFs). Addressing such gaps will be crucial to minimize the risk of infectious waste contaminating soil, water, and the broader environment in the basin.

*Table 39 Biomedical Waste Generation in the Narmada River Basin*

| Districts | Quantity of Biomedical Waste generated (Kg/day) | Quantity of biomedical waste treated per day (Kg/day) |
|-----------|-------------------------------------------------|-------------------------------------------------------|
| Alirajpur | 190                                             | 190                                                   |

|             |        |        |
|-------------|--------|--------|
| Anuppur*    | 87.49  | 87.49  |
| Balaghat    | 172    | 172    |
| Barwani     | 184.59 | 184.59 |
| Betul       | 243.55 | 243.55 |
| Burhanpur   | 260.62 | 3.62   |
| Chindwara   | 268.68 | 239.17 |
| Damoh       | 111.84 | 111.84 |
| Dewas       | 273.33 | 273.33 |
| Dhar        | 201.1  | 201.1  |
| Dindori     | 52     | 52     |
| Harda       | 85     | 85     |
| Hosangabad  | 310.6  | 310.6  |
| Indore      | 29     | -      |
| Jabalpur    | 1899   | 1703   |
| Jhabua      | 207.3  | 207.3  |
| Katni       | 219.05 | 219.05 |
| Khandwa     | 297.47 | 297.47 |
| Khargone    | 368.97 | 368.97 |
| Mandla      | 115    | 115    |
| Narshingpur | 120    | 120    |
| Raisen      | 95.35  | 95.35  |

|        |        |        |
|--------|--------|--------|
| Sagar  | 271    | 296.35 |
| Sehore | 190.17 | 190.17 |
| Seoni  | 130    | 128    |
| Umaria | 96.65  | 96.65  |

\*All the data filled according to the basin Portion.

Source: Madhya Pradesh Pollution Control Board. (2025). District Environment Plans

In Bharuch district, about 27,200 kilograms of biomedical waste is generated every day from 827 authorized healthcare units, which include 292 bedded and 688 non-bedded facilities. In Ankleshwar, the same waste is collected from hospitals and clinics across the district. In Narmada district, Rajpipla generates around 180–200 kilograms of biomedical waste per day. In Chhota Udepur district, about 250 kilograms of biomedical waste is generated daily from 98 bedded and 142 non-bedded facilities(**Table 40**). Overall, all districts produce biomedical waste regularly from hospitals, clinics, and other medical centers.

*Table 40 Biomedical Waste generated in lower basin*

| District           | No. of Facilities                 | Waste Generated (kg/day) | Facility Type              |
|--------------------|-----------------------------------|--------------------------|----------------------------|
| Bharuch            | 827 (292 bedded + 688 non-bedded) | 27,200                   | Hospitals & clinics        |
| Narmada (Rajpipla) | -                                 | 180–200                  | Hospitals & health centers |
| Chhota Udepur      | 240 (98 bedded + 142 non-bedded)  | 250                      | Healthcare units           |

\*Source: GPCB District environment plan

### 6.2.2. Biomedical Waste Management

Biomedical waste management (BMWM) across the Narmada Basin districts of Madhya Pradesh shows comparatively better institutional coverage than other waste streams such as C&D or plastic waste, primarily due to the presence of Common Biomedical Waste Treatment Facilities (CBWTFs) across the state. Almost all districts are covered by regional CBWTFs, ensuring treatment and disposal through incineration, autoclaving, or deep burial in accordance

with the Biomedical Waste Management Rules, 2016. The district level review is presented in **Annexure Table A12**.

District-level monitoring committees have been formed in all districts, which is a positive step towards compliance and oversight. Districts such as Betul, Burhanpur, Chhindwara, Damoh, Dewas, Dhar, Dindori, Harda, Hoshangabad (Narmadapuram), Indore, Jabalpur, Jhabua, Katni, Mandla, Narsinghpur, Raisen, Sagar, Sehore, Umaria, and West Nimar report no major gaps in biomedical waste management. Treatment and disposal are being carried out through functional CBWTFs located either within the district or in nearby districts, and committees are active in monitoring compliance.

However, specific gaps have been noted in certain districts:

- Alirajpur and Barwani – Require periodic awareness programs and inventory updates to ensure accurate reporting of biomedical waste generation and treatment.
- Anuppur and Balaghat – Need full implementation of barcoding for biomedical waste tracking from generation to disposal.
- Seoni – Requires strengthening of the barcoding system for biomedical waste to achieve full efficiency.

These gaps primarily relate to operational aspects (such as inventory management, barcoding, and awareness) rather than infrastructure deficiencies. The presence of CBWTFs has ensured that biomedical waste is not left untreated in any of the districts.

Indore, Jabalpur, and Bhopal divisions host major CBWTFs that also cater to adjoining districts, ensuring regional coverage. For instance, Indore's Hoswin Incinerator Pvt. Ltd. manages biomedical waste from multiple western districts, while Medisure Incinerators in Khandwa cater to southern districts such as Burhanpur and West Nimar. Similarly, Seoni and Umaria CBWTFs serve adjoining tribal and forest-dominated districts.

In summary, biomedical waste management in the Narmada Basin is relatively robust, with full coverage by CBWTFs and functioning monitoring committees. The critical areas requiring attention include strict enforcement of barcoding, timely inventory updates, and regular awareness programs for healthcare facilities and local bodies. Compared to other waste streams, biomedical waste management demonstrates a higher level of compliance and

institutionalization, though operational efficiency needs continuous improvement. Bharuch district has an organized biomedical waste management system. A Common Biomedical Waste Treatment and Disposal Facility (CBWTF) named *Globe Bio Care* at Ankleshwar manages all biomedical waste from the district. The facility has an incinerator of 100 kg/hr, an autoclave of 50 kg/hr, and a shredder of 50 kg/hr. All waste generated is treated properly. However, barcoding for waste tracking has not started yet, though GPS has been installed in collection vehicles.

In Ankleshwar, the *Globe Bio Care* facility plays a key role in treating biomedical waste for the entire district. Barcoding is yet to be used and is planned by June 2022. Training and awareness for healthcare staff are being conducted. Wastewater from hospitals goes into municipal drains, and a new Sewage Treatment Plant (STP) is planned by December 2022. In Rajpipla, biomedical waste is sent to *Globe Bio Care* in Bharuch since there is no local facility. About 180–200 kg/day of waste is treated daily. Only 10% of healthcare units use barcoding, but full implementation is planned by December 2023. Regular awareness and training programs are held, and wastewater is managed through septic tanks until improvements are completed. In Chhota Udepur district, biomedical waste is sent to the *Samvedana BMW Incinerator* at Halol, where 100% of the waste is treated safely. Barcoding is already in use, but continuous staff training and strict monitoring are needed to ensure full compliance.

## 6.3 E-Waste

### 6.3.1. E-Waste Generation

E-waste generation in the Narmada River Basin depicted in **Table 41** reflects the rapid growth of electronics consumption and urbanization. The largest share is concentrated in Indore (51,115.53 MT/annum), which alone accounts for the majority of the basin's total, owing to its status as a metropolitan hub and industrial center. Other notable contributors include Sagar (133.50 MT/annum), Jabalpur (115.07 MT/annum), Dewas (89.92 MT/annum), and Katni (75.60 MT/annum), all of which have expanding urban populations and active commercial sectors.

Medium-scale quantities are reported from districts such as Damoh (65.53 MT), Jhabua (66.62 MT), Raisen (59.71 MT), and Narsinghpur (58.90 MT), while smaller volumes are observed in Barwani (77.20 MT), Sehore (77.35 MT), and Khargone (21.60 MT). Tribal and rural-

dominated districts such as Dindori (6.61 MT), Balaghat (10.25 MT), and Anuppur (38 MT) generate relatively low e-waste due to lower levels of electronic penetration.

The data indicate a highly uneven distribution, with Indore emerging as the critical hotspot requiring advanced collection, segregation, and recycling facilities. For smaller districts, decentralized collection and integration into state-level recycling frameworks will be essential to prevent unscientific disposal and associated risks of soil and groundwater contamination.

*Table 41 Electronic Waste Generation in the Narmada River Basin*

| Districts  | Present Status (MT/Annum) |
|------------|---------------------------|
| Alirajpur  | 41.7                      |
| Anuppur*   | 38                        |
| Balaghat   | 10.25                     |
| Barwani    | 77.2                      |
| Betul      | 11.9                      |
| Burhanpur  | 43.4                      |
| Chindwara  | 11.58                     |
| Damoh      | 65.53                     |
| Dewas      | 89.92                     |
| Dhar       | 28.56                     |
| Dindori    | 6.61                      |
| Harda      | -                         |
| Hosangabad | 11.73                     |
| Indore     | 51115.53                  |
| Jabalpur   | 115.07                    |

|             |       |
|-------------|-------|
| Jhabua      | 66.62 |
| Katni       | 75.6  |
| Khandwa     | 18.73 |
| Khargone    | 21.6  |
| Mandla      | -     |
| Narshingpur | 58.9  |
| Raisen      | 59.71 |
| Sagar       | 133.5 |
| Sehore      | 77.35 |
| Seoni       | 18.25 |
| Umaria      | 39.59 |

*\*All the data filled according to the basin Portion.*

*Source: Madhya Pradesh Pollution Control Board. (2025). District Environment Plans*

In Bharuch district, about 4,480 metric tons of e-waste is generated every year. The amount is quite large because of the growing use of electrical and electronic items. In Ankleshwar, e-waste generation is also high due to its industrial activities. Rajpipla and Chhota Udepur have smaller towns, but e-waste is still produced from households, offices, and shops. However, the exact quantity in these two districts has not been recorded yet. Overall, all four districts generate e-waste, but proper systems to handle it are not yet in place.

### **6.3.2. E-Waste Management**

E-waste management across the Narmada Basin is still at a nascent stage compared to biomedical and hazardous waste management. While a few districts such as Chhindwara, Raisen, Sehore, and Indore have established e-waste collection centres and partial linkages with authorized recyclers/dismantlers, the majority of districts continue to face gaps in infrastructure and stakeholder integration. As identified in the District Environmental Plans of different districts, these challenges remain a critical concern requiring systematic intervention



In most districts, including Alirajpur, Anuppur, Damoh, Dindori, Harda, Hosangabad, Jhabua, Katni, Mandla, Narshingpur, Sagar, Seoni, Umaria, and West Nimar, no collection centres are available, and urban local bodies (ULBs) are not linked with authorized recyclers. The absence of formal collection mechanisms often leads to informal or illegal dismantling and recycling practices, posing serious environmental and health risks.

Some districts such as Balaghat, Jabalpur, and Mandla report informal linkages with recyclers at Indore district, but these are limited and not backed by structured agreements. Districts like Barwani, Betul, Burhanpur, Dewas, Dhar, Khandwa, and West Nimar have established collection points but lack proper channelization of e-waste to authorized recyclers/dismantlers, reflecting a partial compliance gap.

Chhindwara stands out as a relatively better-performing district, with two collection points and functional linkages, reporting no major gaps. Similarly, Raisen and Sehore have established collection centres and demonstrated effective linkage with recyclers, showing that with institutional support, e-waste management systems can be developed successfully.

The key challenges identified include:

- Lack of collection centres in most districts.
- Absence of formal agreements between ULBs and authorized recyclers/dismantlers.
- Need for awareness campaigns to regulate illegal dismantling and recycling.
- Inadequate infrastructure investment for collection, storage, and channelization.

Overall, e-waste management in the Narmada Basin requires urgent strengthening through the establishment of dedicated collection centres in every district, formal linkages with authorized recyclers, and enhanced public and institutional awareness. In contrast to biomedical waste, which is largely covered through Common Biomedical Waste Treatment Facilities (CBWTFs), and hazardous waste, which is managed with the support of the Dhar TSDF, e-waste continues to remain the weakest component of the basin's waste management framework. The district-level situation, highlighting existing facilities and identified gaps, is presented in **Annexure Table A13**.

At present, there are no e-waste collection centers or authorized recyclers in Bharuch district. The district plans to create an inventory and set up collection points by December 2022, along

with public awareness programs. In Ankleshwar, no collection centers exist yet, but work is planned to identify bulk e-waste generators and prepare an inventory by December 2022. Collection points and awareness drives will follow, and the informal sector will be included in the system.

In Rajpipla, there are also no recyclers or collection centers. The Nagarpalika plans to open collection points by August 2022 and connect with authorized recyclers. Awareness programs will be done with help from local offices and communities. In Chhota Udepur, no inventory or facility exists yet. The district plans to prepare an e-waste inventory, set up collection centers at municipal and block levels, and link them with recyclers in nearby districts. Awareness activities will also be started to stop unsafe handling of e-waste by informal workers.

## **6.4 Plastic waste**

### **6.4.1. Plastic Waste Generation**

Plastic waste generation in the Narmada River Basin shows in **Table 42** distinct variations across districts, primarily influenced by levels of urbanization, industrial activity, and consumption patterns. Districts such as Khargone (11.30 TPD in 2025), Mandla (21.23 TPD in 2025), and Dewas (7.12 to 8.06 TPD by 2030) emerge as major contributors, reflecting both urban expansion and increased packaging-related waste streams. Similarly, Dhar (6.10 to 6.70 TPD) and Hoshangabad (3.74 to 3.98 TPD) indicate steady growth trends. In contrast, smaller and rural districts such as Seoni (0.01 TPD), Balaghat (0.30 TPD), and Anuppur (0.52 to 0.55 TPD) generate relatively negligible amounts but face persistent challenges of improper disposal and collection inefficiencies.

The uneven growth of plastic waste across the basin underscores the need for differentiated management strategies: high-generation urban centers require advanced material recovery facilities (MRFs) and recycling infrastructure, while low-generation rural areas demand improved door-to-door collection and awareness programs to curb open dumping and burning. For granular, tehsil-level estimates and projections of plastic waste generation, refer to **Annexure Table A5**.

***Table 42 Plastic Waste Generation in the Narmada River Basin***

| <b>Districts</b> | <b>Estimated Generation in 2025<br/>(TPD)</b> | <b>Estimated Generation in 2030<br/>(TPD)</b> |
|------------------|-----------------------------------------------|-----------------------------------------------|
| Alirajpur        | 0.78                                          | 0.85                                          |
| Anuppur*         | 0.52                                          | 0.55                                          |
| Balaghat         | 0.3                                           | 0.3                                           |
| Barwani          | 2.83                                          | 3.1                                           |
| Betul            | 1.96                                          | 2                                             |
| Burhanpur        | 0.5                                           | 0.6                                           |
| Chindwara        | 0.98                                          | 1.04                                          |
| Damoh            | 2.79                                          | 2.9                                           |
| Dewas            | 7.12                                          | 8.06                                          |
| Dhar             | 6.1                                           | 6.7                                           |
| Dindori          | 0.3                                           | -                                             |
| Harda            | 1.26                                          | -                                             |
| Hosangabad       | 3.74                                          | 3.98                                          |
| Indore           | 0.56                                          | -                                             |
| Jabalpur         | 2.13                                          | 2.25                                          |
| Jhabua           | 1.01                                          | 1.11                                          |
| Katni            | 1.31                                          | 1.42                                          |
| Khandwa          | 3.94                                          | -                                             |
| Khargone         | 11.3                                          | -                                             |

|             |       |      |
|-------------|-------|------|
| Mandla      | 21.23 | -    |
| Narshingpur | 2.06  | 2.13 |
| Raisen      | 2.62  | 2.81 |
| Sagar       | 0.67  | 0.71 |
| Sehore      | 2.7   | 3.44 |
| Seoni       | 0.01  | -    |
| Umaria      | 0.6   | 0.7  |

*\*All the data filled according to the basin Portion.*

*Source: Madhya Pradesh Pollution Control Board. (2025). District Environment Plans*

In Bharuch district, a large amount of plastic waste is generated. Bharuch Nagarpalika produces about 7 tons per day (TPD), and Ankleshwar Nagarpalika generates around 3 TPD. At the panchayat level, about 480 kilograms per day of plastic waste is produced, and gram panchayats together generate around 11 kilograms per day. In Narmada district, Rajpipla Nagarpalika produces about 2 TPD of plastic waste. At the block and taluka level, generation is around 150 kilograms per day, and another 150 kilograms per day is produced by 222 gram panchayats across 5 tehsils. In Chhota Udepur district, the quantity is much smaller, around 0.040 TPD, mostly from Chhota Udepur town. Overall, plastic waste generation in all four districts varies, but proper systems for collection and recycling are still developing.

**Table 43 Plastic Waste in each Nagarpalika in lower basin**

| <b>Nagarpalika</b> | <b>Plastic Waste (TPD)</b> |
|--------------------|----------------------------|
| Bharuch            | 7                          |
| Ankleshwar         | 3                          |
| Narmada (Rajpipla) | 2                          |
| Chhota Udepur      | 0.040                      |

*\*Source: GPCB District environment plan*

## 6.4.2. Plastic Waste Management

The analysis of plastic waste management across the districts of the Narmada Basin in Madhya Pradesh highlights uneven progress in door-to-door collection, establishment of plastic waste collection centers, and availability of disposal or recycling facilities.

Door-to-door collection of plastic waste has been initiated in most districts, with full coverage reported in Barwani, Betul, Chhindwara, Dhar, Harda, Hoshangabad (Narmadapuram), Indore, Jabalpur, Jhabua, Katni, Narsinghpur, Raisen, Sagar, and parts of West Nimar. However, in several districts like Anuppur, Damoh, Dewas, Sehore, and Seoni, door-to-door collection remains partial or inadequate, indicating a need for strengthening local level implementation and improving coverage efficiency.

Plastic waste collection centers exist only in select districts, often concentrated at district headquarters (e.g., Betul, Chhindwara, Katni, Harda, and Hoshangabad). In rural and smaller ULBs, the absence of collection points continues to hinder effective channelization of waste for recycling or co-processing. Similarly, disposal and recycling facilities are not uniformly distributed. While Indore, Jabalpur, Dhar, Jhabua, and Hoshangabad have integrated solutions through cement co-processing, waste-to-energy plants, or recycling facilities, many districts such as Alirajpur, Mandla, Narsinghpur, and Seoni continue to rely on basic collection without proper disposal mechanisms.

Districts like Harda, Hoshangabad, Indore, Sagar, Jhabua, and Umaria report minimal or no gaps, reflecting relatively advanced systems of collection and recycling. In contrast, districts including Anuppur, Balaghat, Mandla, Sehore, and West Nimar require urgent establishment of plastic waste collection centers and processing facilities. In many cases, informal recycling practices are prevalent, but integration of the informal sector with formal waste management structures remains limited.

The major challenges identified across districts include partial or absent door-to-door collection, lack of decentralized collection centers, inadequate plastic waste processing or recycling units, and insufficient community awareness. Additionally, the enforcement of Extended Producer Responsibility (EPR) and integration of NGOs or private operators into the plastic waste value chain are limited in scope.

In summary, while certain urban centers in the Narmada Basin have made commendable progress by linking plastic waste management with recycling, co-processing, and energy recovery, large parts of the basin still face systemic gaps. Strengthening collection networks, establishing district-level processing units, and promoting sustainable recycling practices are critical for effective plastic waste management across the basin. The district-level situation, highlighting existing facilities and identified gaps, is presented in **Annexure Table A14**. In Bharuch district, door-to-door collection of plastic waste is about 74% in panchayats and

almost complete in nagarpalikas, but segregation and transfer systems still need improvement. Bharuch Nagarpalika has started setting up material recovery facilities, while Ankleshwar, Jambusar, and Amod have not yet begun. In Ankleshwar, the collection of plastic waste has started but is not fully covered. The waste is taken directly to the dumping site because a plastic waste collection center is not yet built. A new center is planned once land is allotted, with completion targeted by December 2022. Awareness programs are being planned by the Nagarpalika and district offices to promote recycling and proper disposal.

In Narmada district, plastic waste management in Rajpipla is still developing. Door-to-door collection of dry waste, including plastic, is 0% at present, but the Nagarpalika has achieved full coverage within the town. In villages, only about 50% of waste is collected. Plans are made to build compost pits, segregation sheds, and collection centers at the block level with the help of the Statue of Unity authority by March 2024. In Chhota Udepur district, door-to-door collection is not fully working, and organized systems like material recovery facilities are missing. Plastic waste centers are few, and public awareness about recycling is very low. The district's action plan includes 100% door-to-door collection, new MRFs, and links with recyclers and cement plants for safe plastic co-processing.

## **6.5 C&D WASTE**

### **6.5.1. C&D Waste Generation**

Construction and Demolition (C&D) waste generation across the Narmada River Basin shown in **Table 32** districts is projected to rise moderately between 2025 and 2030, reflecting steady urban growth and infrastructure expansion. Districts such as Dewas (49.42 TPD in 2025, 54.99 TPD in 2030), Barwani (19.45 to 21.39 TPD), and Hoshangabad (17.16 to 18.20 TPD) stand out as major contributors due to rapid real estate and industrial activity. Comparatively, smaller and rural-dominated districts such as Seoni (0.50 TPD), Balaghat (0.54-0.57 TPD), and Dindori (0.80 TPD) show very low C&D waste loads. This variation highlights the need for targeted strategies urban clusters will require dedicated C&D recycling facilities, while rural areas may benefit from decentralized reuse and backfilling practices. For detailed tehsil-level estimates and projected trends, refer to **Annexure Table A5**.

*Table 44 C&D Waste Generation in the Upper and middle Narmada River Basin*

| <b>Districts</b> | <b>Estimated C&amp; D Waste Generation (TPD) in 2025</b> | <b>Estimated C&amp;D Waste Generation (TPD) in 2030</b> |
|------------------|----------------------------------------------------------|---------------------------------------------------------|
| Alirajpur        | 5.37                                                     | 5.78                                                    |
| Anuppur*         | 3.56                                                     | 3.75                                                    |
| Balaghat         | 0.54                                                     | 0.57                                                    |
| Barwani          | 19.45                                                    | 21.39                                                   |
| Betul            | 10.96                                                    | 11.57                                                   |
| Burhanpur        | 2.07                                                     | 2.22                                                    |
| Chindwara        | 5.66                                                     | 5.97                                                    |
| Damoh            | 7.88                                                     | 9.41                                                    |
| Dewas            | 49.42                                                    | 54.99                                                   |
| Dhar             | 16.56                                                    | 18.12                                                   |
| Dindori          | 0.802                                                    | -                                                       |
| Harda            | 2.09                                                     | -                                                       |
| Hosangabad       | 17.16                                                    | 18.2                                                    |
| Indore           | 0.5                                                      | -                                                       |
| Jabalpur         | 14.5                                                     | 15.5                                                    |
| Jhabua           | 4.8                                                      | 5.32                                                    |
| Katni            | 9                                                        | 9.7                                                     |
| Khandwa          | 6.4                                                      | -                                                       |
| Khargone         | 2.03                                                     | -                                                       |

|             |       |       |
|-------------|-------|-------|
| Mandla      | 2.95  | -     |
| Narsinghpur | 10.85 | 11.35 |
| Raisen      | 13.78 | 14.78 |
| Sagar       | 4.6   | 4.9   |
| Sehore      | 16.47 | 21.25 |
| Seoni       | 0.5   |       |
| Umaria      | 2.45  | 2.68  |

*\*All the data filled according to the basin Portion.*

*Source: Madhya Pradesh Pollution Control Board. (2025). District Environment Plans*

In Bharuch district, a large amount of Construction and Demolition (C&D) waste is generated. Bharuch Nagarpalika produces about 5 tons per day (TPD), while Ankleshwar Nagarpalika generates around 0.5 TPD. In Narmada district, Rajpipla Nagarpalika also produces about 0.5 TPD of C&D waste. In Chhota Udepur district, around 0.5 metric tons per day of C&D waste is generated. C&D Waste Generated by each Nagarpalika shown in **table 45**. The quantity of waste varies, but most of these areas do not have proper recycling systems in place yet.

*Table 45 C&D Waste generated in each Nagarpalika in lower basin*

| Nagarpalika        | Waste Generated (TPD) |
|--------------------|-----------------------|
| Bharuch            | 5                     |
| Ankleshwar         | 0.5                   |
| Narmada (Rajpipla) | 0.5                   |
| Chhota Udepur      | 0.5                   |

*\*Source: GPCB District environment plan*

### 6.5.2. C&D Waste Management

The review of C&D waste management in the Narmada Basin districts highlights an overall lack of comprehensive systems for collection, recycling, and reuse of construction and demolition waste, though a few districts have made noteworthy progress.



In districts such as Harda, Jabalpur, Raisen, Sagar, Mandla, Narsinghpur, and West Nimar, partial or complete systems for collection and reuse are operational, and in some cases recycling facilities exist. For instance, Jabalpur and Harda demonstrate good practices with available recycling units and use of recycled material in non-structural concrete, road filling, and low-lying area restoration, leaving little to no gap in implementation. Similarly, Sagar has both collection and recycling systems, indicating compliance with C&D waste management rules.

Conversely, many districts such as Alirajpur, Anuppur, Barwani, Burhanpur, Dindori, Jhabua, Katni, Dhar, and Dewas show significant gaps, with either no facilities for collection and recycling or reliance on unscientific practices like dumping into low-lying areas. In several ULBs, separate collection exists but without supporting recycling plants, leading to improper disposal. Alirajpur and Burhanpur represent typical cases where waste is dumped without treatment, indicating urgent need for processing facilities.

Chhindwara stands out as one of the few districts with a private third-party operator (M/s Dadaji Traders) engaged in recycling activities, though such facilities are restricted to urban centers and not yet extended to rural areas. Hoshangabad (Narmadapuram) shows partial progress, with separate collection in multiple ULBs, but lacks adequate recycling facilities, limiting the scientific use of collected material.

Districts such as Balaghat, Mandla, Seoni, and Narsinghpur report very low generation of C&D waste, which has led to a perception that dedicated recycling plants are not required. In these cases, waste is reused locally for filling or minor construction activities. However, as urbanization accelerates, even these districts may require systematic solutions in the future.

The most common practice across the basin remains dumping of C&D waste into low-lying areas or reuse in landfilling and road works, often without scientific monitoring. Dedicated recycling plants are absent in the majority of districts, and even where collection is available, segregation and utilization of recycled products are limited.

Key challenges include the absence of dedicated recycling units, lack of decentralized collection points, limited awareness among local bodies, and insufficient integration of C&D waste into circular economy approaches such as paver block production and road construction.

In summary, only a handful of districts like Harda, Jabalpur, Raisen, and Sagar show relatively strong systems with minimal gaps, while the majority of the Narmada Basin districts continue to face critical deficiencies in C&D waste management. Establishing decentralized collection centers, setting up recycling facilities, and ensuring the use of recycled products in local construction are essential steps to bridge these gaps and promote sustainable management of construction waste. The district-level situation, highlighting existing facilities and identified gaps, is presented in **Annexure Table A15**.

At present, Bharuch and Ankleshwar Nagarpalikas do not have any recycling facilities. Bharuch Nagarpalika has prepared a Detailed Project Report for a C&D waste treatment and recycling facility at Saykha GIDC, which was planned for completion by June 2022. Bharuch has also started using C&D waste for road pavements and aims to fully implement this by June 2024. In Ankleshwar, C&D waste is collected by vans, but there is no fixed site for deposition or recycling. Due to the small amount of waste, no recycling plant is planned yet, but the waste is used for landfilling and road filling.

In Narmada district, Rajpipla Nagarpalika does not have any recycling facility or deposition point. It plans to identify deposition sites and start collecting user fees for C&D waste by December 2022. Reuse of C&D waste in construction is not happening yet, but may start in the future. In Chhota Udepur district, recycling facilities are available, but waste is not properly separated at the source, and deposition points are missing. The district plans to set up common deposition sites, use recycled waste for paving and rural roads, and increase public awareness through regular campaigns.

## 7. Pollution Load Assessment

### 7.1 Domestic Pollution Load Status

Domestic sewage is one of the major sources of pollution in the Narmada Basin, with most districts reporting either the absence of sewage treatment plants (STPs) or insufficient treatment capacity. The compiled data highlights that while the generation of sewage is significant, the treatment infrastructure remains grossly inadequate, leading to large volumes of untreated wastewater entering rivers, lakes, and streams.

Districts such as Alirajpur, Anuppur, Betul, Harda, Narmadapuram, Seoni, and Umaria report 100% untreated sewage, indicating no treatment facilities despite moderate to high generation levels. Similarly, Jhabua, Dhar, Khandwa, and Barwani discharge almost their entire sewage load untreated, contributing to heavy riverine pollution. In Balaghat, Mandla, and Narsinghpur, negligible treatment exists, often through isolated units with very low capacity.

Urban centers like Indore, Jabalpur, Dewas, Sagar, Sehore, and Raisen have partial sewage treatment infrastructure, but treatment capacity lags behind sewage generation. For example, Indore generates 475 MLD of sewage, but only a part is treated despite the presence of multiple STPs. Jabalpur generates 230 MLD, but with 60% untreated sewage, major gaps persist. Similarly, Dewas and Sagar have STPs, but treatment percentages remain low.

The requirement of new STPs is universally high, with most districts needing between 5 to 15 additional plants to handle existing and future loads. A few districts, such as Burhanpur and Sehore, show partial progress with one STP operational, but untreated sewage still exceeds 50%.

Key challenges observed across the basin include:

- High percentage of untreated sewage (70–100% in most districts).
- Insufficient STP capacity, often limited to large cities only.
- Direct discharge of sewage into rivers, drains, and lakes, aggravating water pollution.
- Inadequate sewerage networks, with only a few ULBs having partial underground systems.

Domestic sewage is one of the main sources of pollution in the Lower Narmada Basin. The amount of wastewater depends on how much water is supplied, how many houses are connected to the drainage system, and whether sewage is treated before being released. The basin includes big towns like Bharuch, Ankleshwar, Rajpipla, and Chhotaudepur, along with special areas such as Ekta Nagar and many rural villages(**Table 46**).

In Bharuch, the sewage generation is the highest in the basin. The city produces about 28 MLD of sewage every day. The sewage is collected through a long underground network divided into five zones. The sewage is treated at the STP, which has a design capacity of 29.3 MLD. But due to lack of proper drainage network and not covering whole city some waste remains untreated. But major part of the sewage generated in Bharuch can be treated before discharge.

In Ankleshwar, the sewage generation is about 7.5 MLD. The city has developed a strong sewerage network of around 146 km, which covers most of the residential and commercial areas. A sewage treatment plant with a capacity of 14 MLD is under construction. This is almost double the present sewage generation, which means the plant has enough capacity to handle future growth.

In Rajpipla, the sewage generation is about 4.5 MLD. Earlier, a large part of this sewage was discharged directly into the Karjan River, which polluted the water. Now, this practice has stopped. A 5.5 MLD SBR-based STP was commissioned in 2024 near Chitrawadi by GWSSB. At present, treated water from the plant is reused for gardening, road cleaning, and other non-drinking purposes.

In Chhotaudepur, the total sewage generation is about 4.0 MLD. The town has an STP of 5.0 MLD capacity, which is enough to treat all the sewage. The system faces some problems in the rising main pipeline, but overall, no untreated sewage is being discharged into natural lakes or rivers.

In Ekta Nagar, which includes Kevadia township and the Jungle Safari area, there are two small STPs. The Kevadia township has a 500 KLD STP, while the Jungle Safari has a 400 KLD STP. Together, these treat about 0.9 MLD of sewage. During peak tourist seasons, however, some wastewater may bypass the plants and enter small drains.

In rural areas, most households use septic tanks, leaching pits, or open/covered drains. Piped sewer systems are very limited, and most villages do not have treatment plants. Some larger

villages and small towns may have partial networks or small FSTPs, but data on exact sewage generation is not available.

When we combine the sewage generated by the main towns and special facilities, the Lower Narmada Basin produces around 44.9 MLD of domestic sewage every day. The total installed treatment capacity in these towns is about 54.7 MLD, which is enough to cover the reported load. However, untreated sewage may still enter rivers and drains from rural areas and during peak tourist periods.

*Table 46 Domestic Sewage Generation and Treatment in Lower Narmada Basin*

| Town/Area           | Sewage Generated | STP Capacity  | Status / Notes                                             |
|---------------------|------------------|---------------|------------------------------------------------------------|
| Bharuch             | 28 MLD           | 29.3 MLD      | 5 sewer zones, network of 118 km, effluent meets standards |
| Ankleshwar          | 7.5 MLD          | 14.0 MLD      | 146 km network, 90% complete, plant commissioned in 2021   |
| Rajpipla            | 4.5 MLD          | 5.5 MLD       | New SBR plant (2024), reuse for gardening and cleaning     |
| Chhotaudepur        | 4.0 MLD          | 5.0 MLD       | Adequate capacity, no untreated discharge                  |
| Ekta Nagar + Safari | 0.9 MLD          | 0.9 MLD       | Small STPs, bypass possible during tourist peak            |
| Rural Basin         | Not available    | Not available | Mostly septic tanks and drains, few small FSTPs            |

\*Source: GPCB District environment plan

In conclusion, domestic sewage management in the Narmada Basin is highly inadequate, with a critical gap between generation and treatment. Unless significant investments are made in

STPs, sewerage networks, and decentralized treatment facilities, untreated sewage will remain a major environmental and public health concern in the basin. The district-level situation, highlighting existing facilities and identified gaps, is presented in **Annexure Table A18**.

## **7.2 Industrial Pollution Load Status**

Industrial wastewater generation in the Narmada Basin varies significantly across districts, reflecting the uneven distribution of industries. The data reveals that while some districts have substantial industrial discharge, others report negligible or no industrial wastewater.

Districts such as Anuppur (3.9 MLD, 346 industries), Balaghat (16 MLD, 30 industries), Burhanpur (1.07 MLD, 75 industries), Indore (7.3 MLD, 385 industries), Jabalpur (8 MLD, 30 industries), Sehore (19.2 MLD, 24 industries), and West Nimar (22.28 MLD, 17 industries) show a clear presence of industrial activities. In these districts, most industries are reported to be meeting environmental standards, and a few, like Burhanpur and Indore, have operational Common Effluent Treatment Plants (CETPs).

On the other hand, Narsinghpur (1006 MLD, 15 industries) and Sagar (15,360 KLD, 7 industries) stand out due to very high volumes of wastewater generation relative to the number of discharging units, indicating large-scale industries with significant effluent discharge. Similarly, Khandwa (39.6 MLD, 6 industries) and Chhindwara (46.43 MLD) also highlight concentrated industrial discharge.

Several districts such as Alirajpur, Damoh, Dindori, Mandla, and Harda report zero or negligible wastewater discharge, reflecting either a lack of major industrial units or effective zero liquid discharge practices. However, in some cases (e.g., Harda – 110 KLD, Jhabua – 720 KLD, Umaria – 489 KLD, Katni – 140 KLD), discharge values are recorded in kiloliters per day, which, though smaller than MLD figures, still indicate localized industrial activity.

A critical observation is the lack of CETPs across most districts. Except for Indore, Burhanpur, and Jhabua, where one CETP exists, most districts have no common treatment facilities, compelling industries to rely on individual Effluent Treatment Plants (ETPs). While compliance with standards is generally reported as satisfactory in many districts, the absence of CETPs raises concerns about long-term monitoring, enforcement, and sustainability of wastewater treatment. The district-level situation, highlighting existing facilities and identified gaps, is presented in **Annexure Table A19**.

The Lower Narmada Basin has some of the most industrialized areas of Gujarat. Bharuch and Ankleshwar together form one of the largest industrial hubs in India. These areas have many chemical, pharmaceutical, textile, pulp & paper, and petrochemical industries. Because of this, they generate a very large amount of industrial wastewater every day.

The total industrial wastewater generation in the basin is about 233.9 MLD which is shown in **table 47**. Most of this comes from Bharuch and Ankleshwar, which together produce around 231.2 MLD. Out of this, about 41.96 MLD is treated within industries and discharged into rivers or drains, while the rest is either reused by industries or treated in Common Effluent Treatment Plants (CETPs).

Other districts like Narmada (Rajpipla) and Chhota Udepur have very few industries and their wastewater load is very small. Rajpipla generates about 2.55 MLD, and Chhota Udepur only 0.11 MLD. In both these places, wastewater is treated inside the industries and not released into rivers.

Most industries in the basin follow the discharge rules given by the Gujarat Pollution Control Board (GPCB). Online systems are also available for complaints and regular inspections are carried out.

The largest contribution to industrial wastewater load comes from the chemical and pharmaceutical sector, followed by textile, pulp & paper, and petrochemical industries. Smaller contributions come from agro-based and engineering industries.

*Table 47 Industrial Wastewater Load in Lower Narmada Basin*

| District / Area    | Wastewater Generated | Discharge Status                                 | Notes                              |
|--------------------|----------------------|--------------------------------------------------|------------------------------------|
| Bharuch Region     | 126.787 MLD          | Part discharged (treated), rest managed in CETPs | Major hub – Dahej, Vilayat         |
| Ankleshwar Region  | 104.414 MLD          | Part discharged (treated), rest managed in CETPs | Major hub – Ankleshwar, Panoli     |
| Rajpipla (Narmada) | 2.546 MLD            | No untreated discharge                           | 43 industries discharge wastewater |

|                    |                    |                                                 |                                        |
|--------------------|--------------------|-------------------------------------------------|----------------------------------------|
| Chhota Udepur      | 0.108 MLD          | No untreated discharge                          | Only 5 industries discharge wastewater |
|                    |                    | About 41.96 MLD                                 |                                        |
| <b>Total Basin</b> | <b>233.855 MLD</b> | treated and discharged, reused or sent to CETPs | Majority load from Bharuch– Ankleshwar |

\*Source: GPCB District environment plan

In conclusion, industrial wastewater in the Narmada Basin shows a mixed picture: while some districts like Indore, Burhanpur, and Sehore demonstrate structured wastewater management, others, especially with high discharge volumes like Narsinghpur and Sagar, highlight the urgent need for strengthening treatment infrastructure, setting up CETPs, and ensuring strict compliance monitoring to prevent industrial pollution of the Narmada River system. In lower basin most of industrial waste generated in Bharuch district which is treated in CETP and discharged deep sea.



## 8.Summary And Conclusion

### Summary

The Narmada River Basin covers 38 districts in Madhya Pradesh, Gujarat, Maharashtra, and Chhattisgarh. It gives water to more than 20 million people. The river is very important for farming, industries, and nature.

This study looks at how polluted the river is. It studies waste from homes, industries, and farms. The data is taken from CPCB, MPPCB, GPCB, NGT, and district reports.

Most of the pollution comes from domestic sewage. Many towns do not have enough sewage treatment plants. In towns like Amarkantak, Mandla, Narmadapuram, Barwani, and Jhabua, most sewage goes into the river without cleaning. Even in big cities like Indore and Jabalpur, treatment plants do not work at full capacity. In cities like Bharuch, Rajpipla and Chhota udepur treatment plant is available with more than the sewage generated by city but drainage network does not cover whole areas of city. More small and local treatment systems are needed.

In the lower basin, water is clean at Panetha and Zonor, okay at Garudeshwar, but polluted at Zadeshwar. The main reason for this pollution is waste from towns and industries. Cities like Bharuch and Ankleshwar have sewage treatment plants, but some waste water still goes into the river without treatment. Small towns like Rajpipla and Chhota Udepur have small systems and cause less pollution.

Industrial waste also adds to pollution. Some districts like Indore, Burhanpur, and Sehore have common treatment plants (CETPs) for factory waste. But others like Narsinghpur and Sagar have only individual treatment plants (ETPs), which are not well checked. In the lower basin, industries in Bharuch, Ankleshwar, Dahej, Panoli, and Jhagadia make large amounts of wastewater. Most of this comes from chemical and medicine factories. It is treated in common plants and sent through a deep-sea disposal through pipeline.

**Agricultural runoff** contributes significantly to nutrient and pesticide loading. Elevated nitrate (45–90 mg/L) and phosphate levels (1.5–3.0 mg/L) in districts like Omkareshwar, Hoshangabad, and Barwani indicate risks of eutrophication and water contamination. Heavy metals such as zinc, nickel, and chromium in sediments further highlight ecological stress.

**Solid waste management** shows progress in larger cities like Indore, Bhopal, and Jabalpur, where biomining, composting, and waste-to-energy facilities are operational. However, smaller

and tribal districts face challenges in collection, segregation, and scientific disposal. Biomedical and hazardous waste management has improved with centralized facilities, but e-waste management remains underdeveloped, with few collection centers and weak stakeholder linkages.

Solid waste is another problem, especially in big towns of lower basin. Bharuch and Ankleshwar make the most garbage. Waste separation and composting are happening in some areas but not everywhere. Hospital and hazardous waste are managed better, but plastic and e-waste still need more care.

Overall, the Narmada River faces pollution from many sources domestic sewage, industries, farms waste. Better treatment, strict rules, and public awareness are needed to keep the river clean.

## Conclusion

The Narmada River Basin faces serious pollution problems. The main reasons are sewage from towns, waste from industries, farm chemicals, and poor waste management in small towns. Some big programs like **AMRUT** and **Namami Gange** are helping to build new treatment plants. But there are still many problems. Many towns do not have full sewer lines. Some treatment plants do not work properly. Rules are not always followed, and people's participation is still low.

To clean the river, a **combined effort** is needed. The government, industries, and people must all work together. More money should be spent on new and better treatment plants. Small towns should use simple local systems for wastewater treatment. Industries must treat all their waste before releasing it. All waste should be checked and managed properly.

The Narmada River is becoming more polluted each year. Water is still clean in some areas, but near big towns and industries, it is polluted. People should separate waste at home. Treated water should be reused for gardens or industries.

Saving the Narmada River is very important for people, animals, and nature. The government should check the water quality often. With strong action and teamwork, the Narmada can become clean again and continue to support life and development in the region.

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## ANNEXURE

**Table A - 1 List of National Water Quality Monitoring Stations in Narmada Basin, Madhya Pradesh**

| S.No. | Water Quality Station Code | Station Name                                | State          | Water Body Type | Frequency | Latitude  | Longitude |
|-------|----------------------------|---------------------------------------------|----------------|-----------------|-----------|-----------|-----------|
| 1     | 44                         | NARMADA AT SETHANIGHAT                      | Madhya Pradesh | River           | Monthly   | 22.762685 | 77.71649  |
| 2     | 45                         | NARMADA AT MANDLESHWAR                      | Madhya Pradesh | River           | Monthly   | 22.177393 | 75.659194 |
| 3     | 1234                       | NARMADA AT HOSHANGABAD U/S                  | Madhya Pradesh | River           | Monthly   | 22.756614 | 77.690036 |
| 4     | 1235                       | NARMADA AT HOSHANGABAD D/S                  | Madhya Pradesh | River           | Monthly   | 22.756584 | 77.687182 |
| 5     | 1236                       | CHOTA TAWA BEFORE CONFL. WITH RIVER NARMADA | Madhya Pradesh | River           | Monthly   | 22.562555 | 77.978245 |
| 6     | 1239                       | NARMADA AT BADWANI                          | Madhya Pradesh | River           | Monthly   | 22.037618 | 74.901793 |
| 7     | 1240                       | NARMADA AT NARSINGHPUR                      | Madhya Pradesh | River           | Monthly   | 22.948622 | 79.190171 |
| 8     | 1241                       | NARMADA AT MANDLA NEAR ROAD BRIDGE          | Madhya Pradesh | River           | Monthly   | 22.598638 | 80.371449 |
| 9     | 1242                       | NARMADA NEAR SOURCE AT AMARKANTAK           | Madhya Pradesh | River           | Monthly   | 22.67244  | 81.759518 |

|    |      |                                                            |                   |       |         |           |           |
|----|------|------------------------------------------------------------|-------------------|-------|---------|-----------|-----------|
|    |      | CHAMBAL AT                                                 |                   |       |         |           |           |
| 10 | 1365 | NAGDA U/S<br>(WATER INTAKE<br>POINT)                       | Madhya<br>Pradesh | River | Monthly | 22.428806 | 75.508689 |
| 11 | 1366 | CHAMBAL AT<br>NAGDA D/S                                    | Madhya<br>Pradesh | River | Monthly | 22.428791 | 75.508684 |
| 12 | 1430 | NARMADA AT<br>D/S OF<br>OMKARESHWAR                        | Madhya<br>Pradesh | River | Monthly | 22.243694 | 76.150756 |
| 13 | 1431 | NARMADA AT<br>MAHESHWAR                                    | Madhya<br>Pradesh | River | Monthly | 22.169213 | 75.583684 |
| 14 | 1613 | KOLAR DAM<br>WATER SUPPLY<br>INTAKE WELL,<br>DISTT. SEHORE | Madhya<br>Pradesh | River | Monthly | 22.960571 | 77.346276 |
| 15 | 2099 | NARMADA<br>LALPUR,<br>JABALPUR                             | Madhya<br>Pradesh | River | Monthly | 23.124913 | 79.774671 |
| 16 | 2100 | GOUR RIVER<br>BHOGA DOOR,<br>JABALPUR                      | Madhya<br>Pradesh | River | Monthly | 23.117239 | 79.99781  |
| 17 | 2106 | NARMADA AT<br>NEMAWAR                                      | Madhya<br>Pradesh | River | Monthly | 22.496589 | 76.980555 |
| 18 | 2112 | NARMADA NEAR<br>MORTAKKA<br>BRIDGE,<br>BADWAH              | Madhya<br>Pradesh | River | Monthly | 22.226413 | 76.045534 |
| 19 | 2113 | NARMADA NEAR<br>PUNASA DAM,<br>PUNASA                      | Madhya<br>Pradesh | River | Monthly | 22.283823 | 76.471463 |
| 20 | 2114 | KUNDA AT<br>KHARGONE                                       | Madhya<br>Pradesh | River | Monthly | 22.168429 | 75.723814 |

|    |      |                                                                 |                   |                 |             |           |           |
|----|------|-----------------------------------------------------------------|-------------------|-----------------|-------------|-----------|-----------|
| 21 | 2123 | NARMADA AT<br>KORIGHAT,<br>HOSHANGABAD                          | Madhya<br>Pradesh | River           | Monthly     | 22.761672 | 77.7185   |
| 22 | 2127 | DENWA NEAR<br>SARNI, ROAD<br>BRIDGE                             | Madhya<br>Pradesh | River           | Monthly     | 22.124707 | 78.03034  |
| 23 | 2128 | KHANDARI<br>RESERVOIR<br>WATER OFF<br>TAKE POINT                | Madhya<br>Pradesh | Lake            | Monthly     | 23.160981 | 80.017522 |
| 24 | 2129 | PERIAT TANK<br>NEAR WSS<br>INTAKE POINT,<br>JABALPUR            | Madhya<br>Pradesh | Tank            | Monthly     | 23.235908 | 80.126153 |
| 25 | 2134 | NAGCHUN<br>TALAB AT<br>KHANDWA                                  | Madhya<br>Pradesh | Lake            | Monthly     | 21.86345  | 76.322945 |
| 26 | 2143 | WELL AT<br>KATHODA,<br>JABALPUR                                 | Madhya<br>Pradesh | Ground<br>Water | Half-Yearly | 23.227505 | 79.915977 |
| 27 | 2144 | WELL AT MADAI<br>GRAM,<br>JABALPUR                              | Madhya<br>Pradesh | Ground<br>Water | Half-Yearly | 23.220203 | 79.990963 |
| 28 | 3296 | Choral Dam Near<br>Indore                                       | Madhya<br>Pradesh | Lake            | Monthly     | 22.415255 | 75.756472 |
| 29 | 3299 | Hanumantal,<br>Jabalpur                                         | Madhya<br>Pradesh | Pond            | Monthly     | 23.181769 | 79.937793 |
| 30 | 3300 | Ranital Talab,<br>Jabalpur                                      | Madhya<br>Pradesh | Pond            | Monthly     | 23.173288 | 79.918843 |
| 31 | 3305 | Banjar at<br>Malanjkhanda Near<br>W/S Intake Point,<br>Jabalpur | Madhya<br>Pradesh | River           | Monthly     | 22.049425 | 80.716076 |

|    |      |                                                                                                  |                   |                 |             |           |           |
|----|------|--------------------------------------------------------------------------------------------------|-------------------|-----------------|-------------|-----------|-----------|
| 32 | 3308 | Chambal at<br>Jawnpawa (Origin<br>Point), Indore                                                 | Madhya<br>Pradesh | River           | Monthly     | 22.429328 | 75.508403 |
| 33 | 3321 | Narmada at<br>Amarkantak<br>(Origin Point),<br>Rewa / Narmada at<br>Dindori, U/S Intake<br>Point | Madhya<br>Pradesh | River           | Monthly     | 22.672558 | 81.766411 |
| 34 | 3322 | Narmada at<br>Mandla, Near<br>Shamshanghat,<br>Jabalpur                                          | Madhya<br>Pradesh | River           | Monthly     | 22.598282 | 80.370419 |
| 35 | 3323 | Narmada at Lalpur,<br>Near W/S Intake<br>Point, Jabalpur                                         | Madhya<br>Pradesh | River           | Monthly     | 23.124518 | 79.775616 |
| 36 | 3324 | Narmada at<br>Panchwatighat,<br>Before Mixing with<br>Bawanganga River,<br>Jabalpur              | Madhya<br>Pradesh | River           | Monthly     | 23.133109 | 79.800745 |
| 37 | 3325 | Narmada at<br>Sarswatighat, After<br>Mixing with<br>Bawanganga River,<br>Jabalpur                | Madhya<br>Pradesh | River           | Monthly     | 23.133838 | 79.800558 |
| 38 | 3334 | Tube Well Near<br>Bus Stand, Betul                                                               | Madhya<br>Pradesh | Ground<br>Water | Half-Yearly | 21.900458 | 77.89643  |
| 39 | 3335 | Tube Well / Hand<br>Pump at Industrial<br>Area Rechhai,<br>Jabalpur                              | Madhya<br>Pradesh | Ground<br>Water | Half-Yearly | 23.220624 | 79.976447 |
| 40 | 3822 | Ground water near<br>Bus Stand, Dist<br>Narsingpur                                               | Madhya<br>Pradesh | Ground<br>Water | Half-Yearly | 22.94411  | 79.208599 |



|    |      |                                                                                        |                   |                 |             |           |           |
|----|------|----------------------------------------------------------------------------------------|-------------------|-----------------|-------------|-----------|-----------|
| 41 | 3827 | Ground water, Vill<br>Imalia, Dist<br>Jabalpur                                         | Madhya<br>Pradesh | Ground<br>Water | Half-Yearly | 23.111594 | 79.917595 |
| 42 | 3828 | Hiran, NH-7 Road<br>Bridge, Sihora, Dist<br>Jabalpur                                   | Madhya<br>Pradesh | River           | Monthly     | 23.277289 | 79.649662 |
| 43 | 3829 | Hiran, NH-12 Road<br>Bridge, Vill<br>Vikrampur, Dist<br>Narsingpur                     | Madhya<br>Pradesh | River           | Monthly     | 23.277283 | 79.648869 |
| 44 | 3830 | Gokulpur Talab,<br>Dist Jabalpur                                                       | Madhya<br>Pradesh | Pond            | Monthly     | 23.197346 | 79.986861 |
| 45 | 3847 | Narmada River at<br>Dharampuri                                                         | Madhya<br>Pradesh | River           | Monthly     | 22.146769 | 75.346636 |
| 46 | 3849 | Sitapat Talab, Dhar                                                                    | Madhya<br>Pradesh | Pond            | Monthly     | 22.549469 | 75.309064 |
| 47 | 4577 | Narmada at<br>Chandanghat near<br>Road Bridge                                          | Madhya<br>Pradesh | River           | Monthly     | 22.88105  | 81.303172 |
| 48 | 4578 | Narmada at Puskar<br>Dam, Amarkantak                                                   | Madhya<br>Pradesh | River           | Monthly     | 22.67693  | 81.755469 |
| 49 | 4579 | Narmada at Dindori<br>(D/S after mixing to<br>city domestic, near<br>Jogotikaria Ghat) | Madhya<br>Pradesh | River           | Monthly     | 22.941913 | 81.077261 |
| 50 | 4580 | Narmada near<br>Bhairav Temple at<br>Shhastradhar,<br>Mandla                           | Madhya<br>Pradesh | River           | Monthly     | 22.631124 | 80.3371   |
| 51 | 4581 | Narmada near Road<br>Bridge (D/S Bargi<br>Dam), Jabalpur                               | Madhya<br>Pradesh | River           | Monthly     | 22.940994 | 79.923146 |

|    |      |                                                                       |                   |       |         |           |           |
|----|------|-----------------------------------------------------------------------|-------------------|-------|---------|-----------|-----------|
| 52 | 4582 | Narmada at<br>Jamtara, near<br>Railway Bridge                         | Madhya<br>Pradesh | River | Monthly | 23.100994 | 79.966769 |
| 53 | 4583 | Narmada near Road<br>Bridge,<br>Jhansinghat,<br>Jabalpur              | Madhya<br>Pradesh | River | Monthly | 23.109371 | 79.586374 |
| 54 | 4584 | Narmada NH-44<br>near Road Bridge at<br>Barman, Jabalpur              | Madhya<br>Pradesh | River | Monthly | 23.030243 | 79.019407 |
| 55 | 4585 | Barmanghat, 100 m<br>DS of Mainghat                                   | Madhya<br>Pradesh | River | Monthly | 23.029888 | 79.019363 |
| 56 | 4586 | Narmada NH-44<br>near Road Bridge,<br>Jhikoli, Narsingpur             | Madhya<br>Pradesh | River | Monthly | 23.003329 | 79.192231 |
| 57 | 4587 | Narmada near Road<br>Bridge, Sandia                                   | Madhya<br>Pradesh | River | Monthly | 22.910862 | 78.352357 |
| 58 | 4588 | Narmada at U/S of<br>Village Jait                                     | Madhya<br>Pradesh | River | Monthly | 22.862205 | 77.916949 |
| 59 | 4589 | Narmada at D/S of<br>Village Jait                                     | Madhya<br>Pradesh | River | Monthly | 22.862872 | 77.914305 |
| 60 | 4590 | Narmada U/S<br>before confluence<br>of River Tawa, near<br>Bandrabhan | Madhya<br>Pradesh | River | Monthly | 22.803009 | 77.777088 |
| 61 | 4591 | Narmada D/S after<br>confluence of River<br>Tawa, Ramnagar            | Madhya<br>Pradesh | River | Monthly | 22.795902 | 77.761918 |
| 62 | 4592 | Narmada at<br>Budhnighat,<br>Budhni                                   | Madhya<br>Pradesh | River | Monthly | 22.766248 | 77.687799 |
| 63 | 4593 | Narmada at D/S of<br>Textile Unit,                                    | Madhya<br>Pradesh | River | Monthly | 22.751431 | 77.609669 |

|    |      |                                                                      |                   |       |         |           |           |
|----|------|----------------------------------------------------------------------|-------------------|-------|---------|-----------|-----------|
|    |      | Village Holipura,<br>Budni                                           |                   |       |         |           |           |
| 64 | 4594 | Narmada at before<br>confluence of River<br>Jamner, Vill.<br>Nemawar | Madhya<br>Pradesh | River | Monthly | 22.496059 | 76.979299 |
| 65 | 4595 | Narmada 500 m<br>D/S near Jain<br>Mandir, Vill.<br>Nemawar           | Madhya<br>Pradesh | River | Monthly | 22.497439 | 76.97156  |
| 66 | 4596 | Narmada at<br>Hanuwantia, Dist.<br>Khandwa                           | Madhya<br>Pradesh | River | Monthly | 22.145048 | 76.587208 |
| 67 | 4597 | Narmada at U/S<br>Omkareshwar Dam,<br>Khandwa                        | Madhya<br>Pradesh | River | Monthly | 22.245668 | 76.150971 |
| 68 | 4598 | Narmada River at<br>Dharethwar                                       | Madhya<br>Pradesh | River | Monthly | 22.196054 | 75.915996 |
| 69 | 4599 | Narmada near W/S<br>intake Jallod                                    | Madhya<br>Pradesh | River | Monthly | 22.158717 | 75.690453 |
| 70 | 4600 | Narmada River at<br>Shahastradhara<br>(Jalkoti)                      | Madhya<br>Pradesh | River | Monthly | 22.162334 | 75.545073 |
| 71 | 4601 | Narmada at<br>Khalghat                                               | Madhya<br>Pradesh | River | Monthly | 22.157587 | 75.446411 |
| 72 | 4602 | Narmada River at<br>Semalda, U/S of<br>Barwani                       | Madhya<br>Pradesh | River | Monthly | 22.094917 | 75.045778 |
| 73 | 4603 | Narmada at<br>Koteswar                                               | Madhya<br>Pradesh | River | Monthly | 22.081378 | 74.789532 |
| 74 | 4605 | River Narmada at<br>Kakrana, interstate<br>boundary, Alirajpur       | Madhya<br>Pradesh | River | Monthly | 22.052205 | 74.46991  |

|    |      |                                                                                    |                |              |             |           |           |
|----|------|------------------------------------------------------------------------------------|----------------|--------------|-------------|-----------|-----------|
| 75 | 4613 | Hiran River after mixing Pariyat River, near Road Bridge, Vill. Ganiyari, Jabalpur | Madhya Pradesh | River        | Monthly     | 23.102058 | 79.980953 |
| 76 | 4614 | Suptal, Jabalpur                                                                   | Madhya Pradesh | Lake         | Monthly     | 23.156502 | 79.900679 |
| 77 | 4615 | Ganga Sagar, Jabalpur                                                              | Madhya Pradesh | Lake         | Monthly     | 23.156789 | 79.910135 |
| 78 | 4616 | Banjar River near Road Bridge, Vill. Kharradhar, Malanjkhanda                      | Madhya Pradesh | River        | Monthly     | 22.021068 | 80.712809 |
| 79 | 4617 | Wainganga River near Vill. Budunda, Malanjkhanda, Dist. Balaghat                   | Madhya Pradesh | River        | Monthly     | 22.049905 | 80.716074 |
| 80 | 4618 | Ground Water at Industrial Area, Maneri, Dist. Mandla                              | Madhya Pradesh | Ground Water | Half-Yearly | 23.108477 | 80.252455 |
| 81 | 4619 | Dejla Dewda, Khargone                                                              | Madhya Pradesh | River        | Monthly     | 21.593227 | 75.62365  |
| 82 | 4621 | Nanpur Fata Dam, Alirajpur                                                         | Madhya Pradesh | River        | Monthly     | 22.291974 | 74.580008 |
| 83 | 4627 | Hand Pump, District Hospital, Hoshangabad                                          | Madhya Pradesh | Ground Water | Half-Yearly | 22.757891 | 77.718766 |
| 84 | 4630 | Hand Pump, District Hospital, Betul                                                | Madhya Pradesh | Ground Water | Half-Yearly | 21.901733 | 77.895572 |

\*Source: CPCB, List of NWMP Monitoring Network, [https://cpcb.nic.in/wqm/WQMN\\_list.pdf](https://cpcb.nic.in/wqm/WQMN_list.pdf)

**Table A - 2 MPPCB Water Quality Monitoring Stations in Narmada River Basin, Madhya Pradesh (2019–2025)**

| S. No | District | City/Town  | Name of Monitoring Station                                   | Water Quality Category |         |         |         |         |         |
|-------|----------|------------|--------------------------------------------------------------|------------------------|---------|---------|---------|---------|---------|
|       |          |            |                                                              | 2019-20                | 2020-21 | 2021-22 | 2022-23 | 2023-24 | 2024-25 |
| 1     | Anuppur  | Amarkantak | Narmada River at Amarkantak origin point, Dist. Anuppur      | A                      | A       | A       | A       | A       | A       |
| 2     | Anuppur  | Amarkantak | Narmada River at Puskar Dam, Amarkantak                      | A                      | A       | A       | A       | A       | B       |
| 3     | Anuppur  | Amarkantak | Narmada River at Kapildhara                                  | A                      | A       | A       | A       | A       | A       |
| 4     | Dindori  | Dindori    | Narmada River at Chandanghat near Road Bridge, Dist. Dindori | A                      | A       | A       | A       | A       | A       |
| 5     | Dindori  | Dindori    | Narmada River at Dindori Up Stream                           | A                      | A       | A       | A       | A       | A       |
| 6     | Dindori  | Dindori    | Narmada River at Dindori Down Stream                         | A                      | A       | A       | A       | A       | A       |
| 7     | Mandla   | Mandla     | Narmada River near Shamshanghat, Mandla                      | A                      | A       | A       | A       | A       | A       |
| 8     | Mandla   | Mandla     | Narmada River near Road Bridge, Mandla                       | A                      | A       | A       | A       | A       | A       |
| 9     | Mandla   | Mandla     | Narmada River at Bhairav Temple,                             | A                      | A       | A       | A       | A       | A       |

|    |             |             |                                                                          |   |   |   |   |   |   |
|----|-------------|-------------|--------------------------------------------------------------------------|---|---|---|---|---|---|
|    |             |             | Shhastradhar,<br>Mandla                                                  |   |   |   |   |   |   |
|    |             |             | Narmada River<br>near Road                                               |   |   |   |   |   |   |
| 10 | Jabalpur    | Jabalpur    | Bridge (Down<br>Stream of Bargi<br>Dam), Jabalpur                        | A | A | A | A | A | A |
|    |             |             | Narmada River<br>at Jamtara, near<br>Railway Bridge                      |   |   |   |   |   |   |
| 11 | Jabalpur    | Jabalpur    |                                                                          | A | A | A | A | A | A |
|    |             |             | Narmada River<br>near Water<br>Supply Intake<br>Point, Lalpur            |   |   |   |   |   |   |
| 12 | Jabalpur    | Lalpur      |                                                                          | A | A | A | A | A | A |
|    |             |             | Narmada River<br>at Tilwaraghat                                          |   |   |   |   |   |   |
| 13 | Jabalpur    | Jabalpur    |                                                                          | A | A | A | A | A | A |
|    |             |             | Narmada River<br>at<br>Panchwatighat,<br>Bheraghat                       |   |   |   |   |   |   |
| 14 | Jabalpur    | Jabalpur    |                                                                          | A | A | A | A | A | A |
|    |             |             | Narmada River<br>at Sarswastighat<br>after mixing<br>Bawanganga<br>River |   |   |   |   |   |   |
| 15 | Jabalpur    | Jabalpur    |                                                                          | A | A | A | A | A | A |
|    |             |             | Narmada near<br>Road Bridge at<br>Jhansinghat,<br>Jabalpur               |   |   |   |   |   |   |
| 16 | Jabalpur    | Jabalpur    |                                                                          | A | A | A | A | A | A |
|    |             |             | Narmada N.H.44<br>near Road                                              |   |   |   |   |   |   |
| 17 | Narsinghpur | Narsinghpur | Bridge at<br>Barman,<br>Jabalpur                                         | A | A | A | A | A | A |
|    |             |             | Narmada<br>Barmanghat, 100                                               |   |   |   |   |   |   |
| 18 | Narsinghpur | Narsinghpur |                                                                          | A | A | A | A | A | A |

|    |              |             | mts D/s                                       |   |   |   |   |   |   |
|----|--------------|-------------|-----------------------------------------------|---|---|---|---|---|---|
|    |              |             | Mainghat                                      |   |   |   |   |   |   |
|    |              |             | Narmada S.H.44                                |   |   |   |   |   |   |
| 19 | Narsinghpur  | Narsinghpur | near Road<br>Bridge, Jhilkoli,<br>Narsinghpur | A | A | A | A | A | A |
|    |              |             | Narmada River                                 |   |   |   |   |   |   |
| 20 | Narmadapuram | Sandia      | near Road<br>Bridge, Sandia,<br>Narmadapuram  | B | B | A | A | A | A |
|    |              |             | Narmada River                                 |   |   |   |   |   |   |
| 21 | Sehore       | Jait        | at Up Stream of<br>Village Jait,<br>Sehore    | B | B | A | A | A | A |
|    |              |             | Narmada River                                 |   |   |   |   |   |   |
| 22 | Sehore       | Jait        | at Down Stream<br>of Village Jait,<br>Sehore  | B | B | A | A | A | A |
|    |              |             | Narmada River                                 |   |   |   |   |   |   |
| 23 | Sehore       | Sehore      | at Shahaganj<br>Guest House,<br>Sehore        | B | B | B | A | B | A |
|    |              |             | Narmada Up                                    |   |   |   |   |   |   |
|    |              |             | Stream before                                 |   |   |   |   |   |   |
|    |              |             | Confluence of                                 |   |   |   |   |   |   |
| 24 | Sehore       | Sehore      | River Tawa near<br>Bandrabhan,<br>Sehore      | B | B | B | A | B | A |
|    |              |             | Narmada Down                                  |   |   |   |   |   |   |
|    |              |             | Stream after                                  |   |   |   |   |   |   |
|    |              |             | Confluence of                                 |   |   |   |   |   |   |
| 25 | Sehore       | Ramnagar    | River Tawa,<br>Ramnagar                       | B | B | B | A | B | A |
|    |              |             | Narmada                                       |   |   |   |   |   |   |
| 26 | Sehore       | Budhni      | Budhnighat,<br>Budhni                         | B | B | B | A | B | A |

|    |              |              |                                                                                 |   |   |   |   |   |   |
|----|--------------|--------------|---------------------------------------------------------------------------------|---|---|---|---|---|---|
| 27 | Narmadapuram | Narmadapuram | Narmada<br>Korighat,<br>Hoshangabad                                             | B | B | B | A | B | A |
| 28 | Narmadapuram | Narmadapuram | Narmada<br>Sethanighat,<br>Hoshangabad                                          | B | B | B | A | B | A |
| 29 | Narmadapuram | Narmadapuram | Narmada River<br>100 m Down<br>Stream after<br>SPM Nalla                        | B | B | B | A | B | A |
| 30 | Sehore       | Budhni       | Narmada at<br>Down Stream of<br>Textile Unit,<br>Village<br>Holipura,<br>Budhni | B | B | B | A | B | A |
| 31 | Dewas        | Nemawar      | Narmada at<br>before<br>Confluence of<br>River Jamner,<br>Village<br>Nemawar    | A | A | A | A | A | A |
| 32 | Dewas        | Nemawar      | Narmada at<br>Water Supply<br>Intake Point,<br>Nemawar                          | A | A | A | A | A | A |
| 33 | Dewas        | Nemawar      | Narmada 500 m<br>Down Stream<br>near Jain<br>Mandir, Village<br>Nemawar         | A | A | A | A | A | A |
| 34 | Khandwa      | Hanuwantia   | Narmada at<br>Hanuwantia,<br>Dist. Khandwa                                      | A | A | A | A | A | A |
| 35 | Khandwa      | Punasa       | Narmada River<br>at Punasa Dam                                                  | A | A | A | A | A | A |



|    |          |             |                                                    |   |   |   |   |   |   |
|----|----------|-------------|----------------------------------------------------|---|---|---|---|---|---|
|    |          |             | Narmada at Up                                      |   |   |   |   |   |   |
| 36 | Khandwa  | Omkareshwar | Stream,<br>Omkareshwar<br>Dam                      | A | A | A | A | A | A |
| 37 | Khandwa  | Omkareshwar | Narmada at<br>Omkareshwar<br>Down Stream           | A | A | A | A | A | A |
| 38 | Khargone | Barwaha     | Narmada,<br>Barwaha near<br>Mortakka Bridge        | A | A | A | A | A | A |
| 39 | Khargone | Dhadeshwar  | Narmada River<br>at Dhadeshwar                     | A | A | A | A | A | A |
| 40 | Khargone | Jallod      | Narmada near<br>Water Supply<br>Intake, Jallod     | A | A | A | A | A | A |
| 41 | Khargone | Mandleshwar | Narmada River<br>at Mandleshwar<br>Down Stream     | A | A | A | A | A | A |
| 42 | Khargone | Maheshwar   | Narmada River<br>at Maheshwar<br>Down Stream       | A | A | A | A | A | A |
| 43 | Khargone | Maheshwar   | Narmada River<br>at<br>Shahasthradhar<br>(Jalkoti) | A | A | A | A | A | A |
| 44 | Dhar     | Dhar        | Narmada at<br>Khalghat                             | A | A | A | A | A | A |
| 45 | Dhar     | Dharamपुरी  | Narmada at<br>Dharamपुरी                           | A | A | A | A | A | A |
| 46 | Dhar     | Dharamपुरी  | Narmada River<br>at Dharamपुरी<br>Down Stream      | A | A | A | A | A | A |
| 47 | Barwani  | Barwani     | Narmada River<br>at Semalda Up                     | A | A | A | A | A | A |

|    |           |          |                                |   |   |   |   |   |   |
|----|-----------|----------|--------------------------------|---|---|---|---|---|---|
|    |           |          | Stream of<br>Barwani           |   |   |   |   |   |   |
|    |           |          | Narmada River                  |   |   |   |   |   |   |
| 48 | Barwani   | Barwani  | at Rajghat,<br>Barwani         | A | A | A | A | A | A |
|    |           |          | Narmada River                  |   |   |   |   |   |   |
| 49 | Dhar      | Nisarpur | at Koteswar,<br>Nisarpur, Dhar | A | A | A | A | A | A |
|    |           |          | Narmada River                  |   |   |   |   |   |   |
| 50 | Alirajpur | Kakrana  | at Kakrana                     | A | A | A | A | A | A |

*Source: NGT Report OA No. 71/2023*

([https://www.greentribunal.gov.in/sites/default/files/news\\_updates/report%20in%2071-2023\\_30\\_10\\_23.pdf#page=847.13](https://www.greentribunal.gov.in/sites/default/files/news_updates/report%20in%2071-2023_30_10_23.pdf#page=847.13));

MPPCB, Narmada Water Quality Report (Yearly) (<https://www.mppcb.mp.gov.in/narmada-report16-17-17-18eng.aspx>)

**Table A - 3 List of Large-Scale Industries in Narmada Basin, Madhya Pradesh**

| S.No | Industry / Company                                 | District   |
|------|----------------------------------------------------|------------|
| 1    | M/s H.J.I.Division of Orient Paper Mill, Amlai     | Anuppur    |
| 2    | M/s Ramnik Power and Allies Pvt. Ltd.              | Balaghat   |
| 3    | Sarandi Baraseoni                                  | Balaghat   |
| 4    | M/s Hindustan Copper Limited, Malajkhand           | Balaghat   |
| 5    | M/s Manganese Ore India Ltd, Barveli               | Balaghat   |
| 6    | M/s Hindustan Liver Limited                        | Chhindwara |
| 7    | M/s Raymond Limited, Growth Center, Borgaon        | Chhindwara |
| 8    | ACC, Cement Ltd., Kymore                           | Katni      |
| 9    | Svil Mines Ltd., Village Gudri Kuteshwer, Berhi    | Katni      |
| 10   | ACE Refractory Ltd., Gudri                         | Katni      |
| 11   | Averest Asbestos Industries Ltd., Kymore           | Katni      |
| 12   | Ordnance Factory, Katni                            | Katni      |
| 13   | M/s Simplex Tubes Pvt. Ltd., Growth Centre, Maneri | Mandla     |

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|    |                                                                    |             |
|----|--------------------------------------------------------------------|-------------|
| 14 | M/s P.S.L. Engineering Works Pvt. Ltd., Growth Centre, Maneri      | Mandla      |
| 15 | M/s M.P. Glychem Industries Ltd., Vill. Dobhi T. Niwas             | Mandla      |
| 16 | M/s Hindustan Petroleum Corp. Ltd., Growth Centre, Maneri          | Mandla      |
| 17 | M/s Primo Pick-N-Pack Pvt Unit No. 01, Growth Centre, Maneri       | Mandla      |
| 18 | M/s Primo Pick-N-Pack Pvt Unit No. 02, Growth Centre, Maneri       | Mandla      |
| 19 | M/s Agrawal Indotax Ltd., Vill. Block – Chhaigaon Makhan           | Khandwa     |
| 20 | M/s Navalsingh Sahkari Shakkari Karkhana Mariyadit                 | Burhanpur   |
| 21 | Diamond Cement Factory Pvt. Ltd., Nursingharh                      | Damoh       |
| 22 | Diamond Cement Factory Pvt. Ltd., Imlai                            | Damoh       |
| 23 | Gas Filling Plant, Bhitoni, Teh. Shahpura                          | Jabalpur    |
| 24 | Heavy Vehicle Factory                                              | Jabalpur    |
| 25 | Ordnance Factory, Khamaria                                         | Jabalpur    |
| 26 | Telecom Factory                                                    | Jabalpur    |
| 27 | Grey Iron Foundry                                                  | Jabalpur    |
| 28 | Gun Carriage Factory                                               | Jabalpur    |
| 29 | M/s Udaipur Beverage Ltd., Richhai                                 | Jabalpur    |
| 30 | M/s Vardhman Fabric                                                | Sehore      |
| 31 | M/s Trident Ltd, Hoshangabad Rd., Budni                            | Hoshangabad |
| 32 | M/s Trident Ltd, Unit 2 (Yarn Divn), Vill Barkhedhi                | Hoshangabad |
| 33 | M/s S.E.L Manufacturing Co. Ltd., Vill Mehtwada, Teh. Jawer        | Sehore      |
| 34 | M/s Eknath Solvent Extraction, Gram Pidgoan                        | Harda       |
| 35 | M/s SKG Solvent (Closed)                                           | Harda       |
| 36 | M/s Nikil Sugar Mill, Gram Baranga                                 | Harda       |
| 37 | M/s Dhanlaxmi Solvent Extraction, Gram Palasner                    | Harda       |
| 38 | M/s Mahakaushal Sugar & Power Industries Ltd., Bachyi Tehsil       | Narsinghpur |
| 39 | M/s Kareli Sugar Mill Pvt Ltd., Gadawara Road                      | Narsinghpur |
| 40 | M/s Ruchi Soya Industries Ltd., Pipariya Road, Gadawara            | Narsinghpur |
| 41 | M/s Ruchi Soya Industries Ltd., Pipariya Road, Gadawara, Unit No 2 | Narsinghpur |

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|    |                                                              |             |
|----|--------------------------------------------------------------|-------------|
| 42 | M/s Shakti Sugar Mill Pvt Ltd., Gram Kaundya, Teh. Gadarwara | Narsinghpur |
| 43 | M/s BLA Power Industries Ltd., Gangai, Teh Gadarwara         | Narsinghpur |
| 44 | M/s National Steel & Agro Ind., Lebad                        | Dhar        |
| 45 | M/s R.S.A.L. Steel & Agro Ind., Lebad                        | Dhar        |
| 46 | M/s Bajrang Agro (Food & Oil Div.) Ind. Pvt. Ltd., Lebad     | Dhar        |
| 47 | M/s Great Geliyan Ltd., Lebad                                | Dhar        |
| 48 | M/s PEB Steel Lloyd (I) Pvt. Ltd., Plot No. 3-B, I/A, Kheda  | Dhar        |
| 49 | M/s Allcargo Global Logistics Ltd., Plot No-13-B I/A, Kheda  | Dhar        |
| 50 | M/s Dhar Cement Ltd., Ghandwani                              | Dhar        |

\*Source: *INDUSTRIAL PROFILE OF MADHYA PRADESH 2016 – 17*,  
[https://dcmsme.gov.in/dips/state\\_wise\\_profile\\_16-17/Madhya%20Pradesh%20profile%2016-17.pdf](https://dcmsme.gov.in/dips/state_wise_profile_16-17/Madhya%20Pradesh%20profile%2016-17.pdf)

**Table A - 4 List of Medium Scale Industries in Narmada Basin, Madhya Pradesh**

| S.No | Industry Name                                   | Location                              | District   |
|------|-------------------------------------------------|---------------------------------------|------------|
| 1    | Bhansali Engineering Polymers Limited           | Satnur, Sounsar                       | Chhindwara |
| 2    | P.B.M Polytex Limited                           | Growth center, Borgaon, Sounsar       | Chhindwara |
| 3    | Hanuman Komokroystic Limited                    | Growth center, Borgaon, Teh.- Sounsar | Chhindwara |
| 4    | Suryawanshi Sparring Mills                      | Gram Rajna, Teh. Pandurna             | Chhindwara |
| 5    | Niket Industries                                | A.K.V.N., Borgaon, Teh.- Saunsar      | Chhindwara |
| 6    | Vindhyachal Synthetic Pvt. Limited              | A.K.V.N., Borgaon, Teh-Saunsar        | Chhindwara |
| 7    | Ranbo Webers & Processor Pvt. Limited           | A.K.V.N., Borgaon                     | Chhindwara |
| 8    | J.C.O. Gas Pipe Limited                         | A.K.V.N., Borgaon, Teh- Saunsar       | Chhindwara |
| 9    | Ojaswi Marble & Granite Pvt Ltd                 | Hardua                                | Katni      |
| 10   | Alid Minerals & Pvt. Ltd.                       | Katni                                 | Katni      |
| 11   | Dabur India Ltd Company                         | Katni                                 | Katni      |
| 12   | Sheela Agro Pvt Ltd                             | Katni                                 | Katni      |
| 13   | Fair Food Overseas Pvt Ltd                      | Katni                                 | Katni      |
| 14   | Bhandari Foils Pvt. Ltd. (Unit No.2, Tube Div.) | Plot No. D1-D4, No.1                  | Dewas      |

|    |                                                                                            |                                              |       |
|----|--------------------------------------------------------------------------------------------|----------------------------------------------|-------|
| 15 | Prestige Feed Mills Pvt. Ltd.                                                              | 49-C, Industrial Area No. 2                  | Dewas |
| 16 | Bhandari Foils and Tubes Ltd. (Unit No.1)                                                  | Plot No. D1-D4, Industrial Area No.1         | Dewas |
| 17 | Shiva Automotive Pvt. Ltd.                                                                 | 37c-38 D, Industrial Area No. I              | Dewas |
| 18 | Sanghavi Foods Pvt. Ltd.                                                                   | Vill.- Amona, Teh.- Dewas                    | Dewas |
| 19 | Bhaskar Ex-Oils Ltd.                                                                       | Vill.-Chotamalsapura, P.O.-Siya, Teh.- Dewas | Dewas |
| 20 | Prestige Foods Ltd.                                                                        | 6-B, Industrial Area No.3                    | Dewas |
| 21 | Gabriel India Ltd.                                                                         | Industrial Area No.3                         | Dewas |
| 22 | B E Commercial Unit of Eicher Motor Ltd.                                                   | Dewas                                        | Dewas |
| 23 | Prestige Soya Industries (Prop. Prestige Food Ltd.)                                        | 48-B, Industrial Area No. 3                  | Dewas |
| 24 | Fluidomat Pvt. Ltd.                                                                        | 7c 8j Industrial Area No-1                   | Dewas |
| 25 | Gajra Differential Gears Pvt. Ltd. (Formerly Gajra Transmission & Differential Gears Ltd.) | Gram - Lohar Pipliya, Teh.- Dewas            | Dewas |
| 26 | M.P. Wind Farms                                                                            | Jamgod Rani Hills                            | Dewas |
| 27 | Premier Proteins Ltd.                                                                      | 47-B/48-B, Industrial Area No.1              | Dewas |
| 28 | Hind Filter Ltd.                                                                           | 1/A & 8/A, Industrial Area No. 1             | Dewas |
| 29 | S & H Gears Pvt. Ltd.                                                                      | Station Road                                 | Dewas |
| 30 | G.G Automotive Gears Ltd.                                                                  | 2-A, Industrial Area No. 1                   | Dewas |
| 31 | Premier Industries (India) Ltd (Formerly Premier Extraction Pvt. Ltd.)                     | 45/47-A, Industrial Area No.1                | Dewas |
| 32 | Kuber Lighting Pvt. Ltd. (Formerly Kalpana Industries (Indore) Pvt. Ltd.)                  | Industrial Area No.3                         | Dewas |
| 33 | Premier Nutrition Ltd. (Prop Premier Industries (India) Pvt. Ltd.)                         | 55/56-A, Industrial Area No.1                | Dewas |
| 34 | S. Kumar Ltd. (Formerly Skm Fabrics)                                                       | Industrial Area No.2                         | Dewas |
| 35 | Shubham Powgen (Prop Gwalior Chemical Industries Ltd.)                                     | Jamgod Rani Hills                            | Dewas |
| 36 | Caparo Tubes Steel                                                                         | Dewas                                        | Dewas |
| 37 | Petogan Labs Ltd                                                                           | Dewas                                        | Dewas |

|    |                                               |                                             |             |
|----|-----------------------------------------------|---------------------------------------------|-------------|
| 38 | Krishana Foods Products                       | Siya                                        | Dewas       |
| 39 | National News Print & Paper Mills Ltd.        | Nepa Nagar                                  | Burhanpur   |
| 40 | Narendra Cott Fibers Industries               | Khasra No. 218/1, 2, 3, Alabagh             | Burhanpur   |
| 41 | Burhanpur Tapti Mills Ltd.                    | Lalbag                                      | Burhanpur   |
| 42 | M/s KEC International                         | Gram Devri, Panagar                         | Jabalpur    |
| 43 | M/s Narmada Gelatines Ltd                     | Vill Meerganj, Bheraghat Rd.                | Jabalpur    |
| 44 | M/s Oxilari Production Centre                 | Indl Area, Ricchai                          | Jabalpur    |
| 45 | M/s Commercial Engg & Body building           | Indl Area, Ricchai                          | Jabalpur    |
| 46 | M/s Om Agro Product                           | Gram Bheeta, Teh. Shahpura                  | Jabalpur    |
| 47 | M/s Jabalpur Polytex Pvt Ltd                  | Indl Area, Ricchai                          | Jabalpur    |
| 48 | M/s Carborandum Universal Ltd                 | Indl Estate Adhartal                        | Jabalpur    |
| 49 | M/s Pragya Energy Pvt Ltd                     | Indl Area, Ricchai                          | Jabalpur    |
| 50 | M/s Nai Dunia                                 | Indl Area, Ricchai                          | Jabalpur    |
| 51 | M/s Narsing Extruction allied product Pvt Ltd | Khamtra, Teh. Narsinghpur                   | Narsinghpur |
| 52 | M/s Narmada Sugar Pvt Ltd                     | Paudar, Post Sali Chauka, Teh. Gadarwara    | Narsinghpur |
| 53 | M/s Dhanlaxmi Solvex Pvt Ltd                  | Baghwar Road, Teh. Kareli                   | Narsinghpur |
| 54 | M/s D & H India Pvt. Ltd.                     | Sejwaya                                     | Dhar        |
| 55 | M/s Tirupati Starch & Chemicals               | Lebad, Sejwaya                              | Dhar        |
| 56 | M/s Manoj Surgical Industries Ltd.            | Plot no. 106, Sector-III Pithampur          | Dhar        |
| 57 | M/s Pithampur Poly Products Ltd.              | Plot no. 115, Sector-III Pithampur          | Dhar        |
| 58 | M/s Labh Ganga Marketing Pvt. Ltd.            | Sector-III Pithampur                        | Dhar        |
| 59 | M/s Badve Engg. Ltd.                          | Plot no. 161, Sector-III Pithampur          | Dhar        |
| 60 | M/s Maya Spinners Pvt. Ltd.                   | Plot no. 21, Sector-III Pithampur           | Dhar        |
| 61 | M/s Signet Industries Ltd.                    | Sector-III Pithampur                        | Dhar        |
| 62 | M/s Healthico Pharma Pvt. Ltd.                | Sector-III Pithampur                        | Dhar        |
| 63 | M/s Alpa Laboratories Ltd.                    | Sector-III Pithampur                        | Dhar        |
| 64 | M/s P.J. Beverajes Ltd.                       | Plot no. 76, Sector-III Pithampur           | Dhar        |
| 65 | M/s Vertax Techno Soft Ltd.                   | Plot no. 809A to 809E, Sector-III Pithampur | Dhar        |
| 66 | M/s Jaideep International                     | Plot No. 1, I/A, Kheda                      | Dhar        |

|           |                                       |                                       |      |
|-----------|---------------------------------------|---------------------------------------|------|
| <b>67</b> | M/s Saral Logistics Systems Pvt. Ltd. | Plot No-1-C, Industrial Area, Kheda   | Dhar |
| <b>68</b> | M/s Manish Agrotech Pvt. Ltd.         | Plot No-90-91, Industrial Area, Kheda | Dhar |
| <b>69</b> | M/s Pratibha Sentex Ltd               | Plot No-05, Industrial Area, Kheda    | Dhar |
| <b>70</b> | M/s Trans World Textiles P.Ltd        | Plot No-13-A, Industrial Area, Kheda  | Dhar |
| <b>71</b> | M/s Mahle Migma P.Ltd.                | Plot No. 9, 10 & 11, I/A, Kheda       | Dhar |
| <b>72</b> | M/s Dabur India Ltd.                  | Plot No. 86-A, I/A, Kheda             | Dhar |

*Source: INDUSTRIAL PROFILE OF MADHY PRADESH 2016 – 17,*

*[https://dcmsme.gov.in/dips/state\\_wise\\_profile\\_16-17/Madhya%20Pradesh%20profile%2016-17.pdf](https://dcmsme.gov.in/dips/state_wise_profile_16-17/Madhya%20Pradesh%20profile%2016-17.pdf)*

*Table A - 5 Solid, Plastic and C&D waste generation in Narmada river Basin, Madhya Pradesh*

| Districts | Block(ULB)   | Solid waste                                                 |                                                       | Plastic waste                               |                                          | C&D Waste                                           |                                                    |
|-----------|--------------|-------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------|------------------------------------------|-----------------------------------------------------|----------------------------------------------------|
|           |              | Estimated<br>Solid Waste<br>Generation<br>in 2025<br>(TPD)* | Estimated Solid<br>Waste Generation<br>in 2030 (TPD)* | Estimated<br>Generation<br>in 2025<br>(TPD) | Estimated<br>Generation in<br>2030 (TPD) | Estimated C& D<br>Waste Generation<br>(TPD) in 2025 | Estimated C&D<br>Waste Generation<br>(TPD) in 2030 |
| Alirajpur | Alirajpur    | 17.02                                                       | 18.32                                                 | 0.34                                        | 0.37                                     | 2.33                                                | 2.51                                               |
|           | Bhavara      | 10.2                                                        | 10.98                                                 | 0.2                                         | 0.22                                     | 1.4                                                 | 1.5                                                |
|           | Jobat        | 11.99                                                       | 12.91                                                 | 0.24                                        | 0.26                                     | 1.64                                                | 1.77                                               |
|           |              | 39.21                                                       | 42.21                                                 | 0.78                                        | 0.85                                     | 5.37                                                | 5.78                                               |
| Anuppur*  | Pushprajgarh | 25.98                                                       | 27.34                                                 | 0.52                                        | 0.55                                     | 3.56                                                | 3.75                                               |
| Balaghat  | Baihar       | 5.55                                                        | 5.87                                                  | 0.3                                         | 0.3                                      | 0.54                                                | 0.57                                               |
| Barwani   | Barwani      | 21.55                                                       | 23.7                                                  | 0.43                                        | 0.47                                     | 2.95                                                | 3.24                                               |



|        |           |       |        |      |      |       |       |
|--------|-----------|-------|--------|------|------|-------|-------|
|        | Niwali    | 15.61 | 17.16  | 0.31 | 0.34 | 2.13  | 2.35  |
|        | Pansemal  | 18.02 | 19.81  | 0.36 | 0.39 | 2.46  | 2.71  |
|        | Rajpur    | 25.24 | 27.75  | 0.5  | 0.55 | 3.45  | 3.8   |
|        | Sendhwa   | 42.07 | 46.25  | 0.84 | 0.92 | 5.76  | 6.33  |
|        | Thikiri   | 19.71 | 21.67  | 0.39 | 0.43 | 2.7   | 2.96  |
|        |           | 142.2 | 156.34 | 2.83 | 3.1  | 19.45 | 21.39 |
| Betul* | Amla      | 10    | 10.5   | 0.5  | 0.5  | 2.36  | 2.49  |
|        | Betul     | 19.63 | 20.7   | 0.39 | 0.41 | 2.69  | 2.84  |
|        | Bhaisdehi | 14.93 | 15.74  | 0.3  | 0.31 | 2.04  | 2.16  |
|        | Multai    | 14.89 | 15.7   | 0.5  | 0.5  | 2.04  | 2.15  |
|        | Shahpur   | 13.38 | 14.11  | 0.27 | 0.28 | 1.83  | 1.93  |
|        |           | 72.83 | 76.75  | 1.96 | 2    | 10.96 | 11.57 |
| Bhopal | Huzur     |       |        |      |      |       |       |

|                |            |        |       |      |      |       |       |
|----------------|------------|--------|-------|------|------|-------|-------|
| Burhanpur      | Nepanagar  | 10.6   | 11.4  | 0.5  | 0.6  | 2.07  | 2.22  |
| Chindwara*     | Amarwara   | 17.14  | 18.09 | 0.34 | 0.36 | 2.35  | 2.48  |
| Whole district | Junnardev  | 7      | 7.9   | 0.37 | 0.39 | 1.46  | 1.54  |
|                | Tamiya     | 13.51  | 14.25 | 0.27 | 0.29 | 1.85  | 1.95  |
|                |            | 37.65  | 40.24 | 0.98 | 1.04 | 5.66  | 5.97  |
| Damoh          | Jabera     | 20.19  | 24.9  | 0.98 | 0.4  | 2.77  | 3.41  |
|                | Tendukheda | 17.09  | 21.06 | 0.83 | 0.34 | 2.34  | 2.89  |
|                |            | 37.28  | 45.96 | 1.81 | 0.74 | 5.11  | 6.3   |
| Dewas          | Bagli      | 33.36  | 42.61 | 0.67 | 0.85 | 3.77  | 4.81  |
|                | Dewas      | 110.62 | 119.1 | 5.5  | 6    | 40.41 | 43.51 |
|                | Kannod     | 26.37  | 33.57 | 0.53 | 0.67 | 2.9   | 3.69  |
|                | Khategaon  | 21.14  | 26.92 | 0.42 | 0.54 | 2.34  | 2.98  |
|                |            | 191.48 | 222.2 | 7.12 | 8.06 | 49.42 | 54.99 |

|         |            |        |        |      |     |       |       |
|---------|------------|--------|--------|------|-----|-------|-------|
| Dhar    | Dhar       | 14.31  | 15.65  | 0.7  | 0.8 | 1.96  | 2.14  |
|         | Dharampuri | 18.37  | 20.1   | 0.9  | 1   | 2.52  | 2.75  |
|         | Gandhwani  | 21.2   | 23.19  | 1.1  | 1.2 | 2.9   | 3.18  |
|         | Kukshi     | 11.2   | 12.26  | 0.6  | 0.6 | 1.53  | 1.68  |
|         | Manawar    | 19.32  | 21.14  | 1    | 1.1 | 2.65  | 2.9   |
|         | Sardarpur  | 36.48  | 39.92  | 1.8  | 2   | 5     | 5.47  |
|         |            | 120.88 | 132.26 | 6.1  | 6.7 | 16.56 | 18.12 |
| Dindori | Dindori    | 4.19   |        | 0.19 |     | 0.8   |       |
|         | Shahpura   | 2.44   |        | 0.11 |     | 0.002 |       |
|         |            | 6.63   |        | 0.3  |     | 0.802 |       |
| Khandwa | Harsud     | 16.52  |        | 0.5  |     | 3.5   |       |
|         | Khandwa    | 45.97  |        | 2.07 |     | 0.9   |       |
|         | Pandhana   | 45.83  |        | 1.37 |     | 2     |       |
|         |            | 108.32 |        | 3.94 |     | 6.4   |       |

|            |             |        |        |      |      |       |      |
|------------|-------------|--------|--------|------|------|-------|------|
| Harda      | Harda       | 18     |        | 0.5  |      | 0.08  |      |
|            | Khirkiya    | 0.5    |        | 0.5  |      | 2     |      |
|            | Timurni     | 1.5    |        | 0.26 |      | 0.01  |      |
|            |             | 20     |        | 1.26 |      | 2.09  |      |
| Hosangabad | Babai       |        |        |      |      |       |      |
|            | Bankheri    | 15.12  | 16.03  | 0.3  | 0.32 | 2.07  | 2.2  |
|            | Hoshangabad | 12.73  | 13.49  | 0.25 | 0.27 | 1.74  | 1.85 |
|            | Itarsi      | 33     | 35.5   | 1.67 | 1.77 | 6.55  | 6.94 |
|            | Piparia     | 14.48  | 15.35  | 0.82 | 0.87 | 1.98  | 2.1  |
|            | Seonimalwa  | 20.22  | 21.44  | 0.4  | 0.43 | 2.77  | 2.94 |
|            | Sohagpur    | 14.93  | 15.83  | 0.3  | 0.32 | 2.05  | 2.17 |
|            |             | 110.48 | 117.64 | 3.74 | 3.98 | 17.16 | 18.2 |
| Indore     | Mhow        | 7.616  |        | 0.56 |      | 0.5   |      |

|          |             |       |       |      |      |      |      |
|----------|-------------|-------|-------|------|------|------|------|
| Jabalpur | Jabalpur    | 19.7  | 20.9  | 0.39 | 0.42 | 2.7  | 2.9  |
|          | Kundam      | 14.3  | 15.1  | 0.29 | 0.3  | 2    | 2.1  |
|          | Majholi     | 18.8  | 19.9  | 0.38 | 0.4  | 2.6  | 2.7  |
|          | Patan       | 15.6  | 16.6  | 0.31 | 0.33 | 2.1  | 2.3  |
|          | Shahpura    | 21.4  | 22.7  | 0.43 | 0.45 | 2.9  | 3.1  |
|          | Shihora     | 16.3  | 17.3  | 0.33 | 0.35 | 2.2  | 2.4  |
|          |             | 106.1 | 112.5 | 2.13 | 2.25 | 14.5 | 15.5 |
| Jhabua   | Jhabua      | 14    | 15.8  | 0.72 | 0.79 | 2.8  | 3.1  |
|          | Ranapur     | 4.95  | 5.48  | 0.29 | 0.32 | 2    | 2.22 |
|          |             | 18.95 | 21.28 | 1.01 | 1.11 | 4.8  | 5.32 |
| Katni    | Bahuriband  | 25.85 | 27.98 | 0.52 | 0.56 | 3.5  | 3.8  |
|          | Dhimarkhera | 23.11 | 25.02 | 0.46 | 0.5  | 3.2  | 3.4  |
|          | Rathi       | 16.53 | 17.9  | 0.33 | 0.36 | 2.3  | 2.5  |
|          |             | 65.49 | 70.9  | 1.31 | 1.42 | 9    | 9.7  |

|             |             |       |       |       |      |       |       |
|-------------|-------------|-------|-------|-------|------|-------|-------|
| Mandla      | Bichhiya    | 2.35  |       | 1.83  |      | 0.54  |       |
|             | Mandla      |       |       | 7.7   |      | 2.3   |       |
|             | Nainpur     | 9.65  |       | 11.2  |      | 0.05  |       |
|             | Niwas       | 1.5   |       | 0.5   |      | 0.06  |       |
|             |             | 13.5  |       | 21.23 |      | 2.95  |       |
| Narshingpur | Gadarwara   | 16    | 17    | 0.8   | 0.8  | 3.12  | 3.3   |
|             | Gotegaon    | 20.1  | 21.28 | 0.4   | 0.43 | 2.8   | 2.9   |
|             | Kareli      | 14.6  | 15.46 | 0.29  | 0.31 | 2     | 2.1   |
|             | Narshingpur | 18.25 | 19.32 | 0.37  | 0.39 | 2.5   | 2.6   |
|             | Tendukheda  | 4     | 5     | 0.2   | 0.2  | 0.43  | 0.45  |
|             |             | 72.95 | 78.06 | 2.06  | 2.13 | 10.85 | 11.35 |
| Raisen      | Bareli      | 12    | 13    | 0.6   | 0.7  | 1.19  | 1.28  |
|             | Begamganj   | 14.13 | 15.16 | 0.28  | 0.3  | 2.99  | 3.21  |
|             | Gairatganj  | 13.42 | 14.4  | 0.26  | 0.28 | 1.94  | 2.08  |

| Goharganj |              |        |        |      |      |       |       |
|-----------|--------------|--------|--------|------|------|-------|-------|
|           | Raisen       | 16     | 17     | 0.8  | 0.8  | 3.04  | 3.26  |
|           | Silvani      | 17.11  | 18.36  | 0.34 | 0.36 | 2.78  | 2.98  |
|           | Udaipura     | 17.34  | 18.61  | 0.34 | 0.37 | 1.84  | 1.97  |
|           |              | 124    | 96.53  | 2.62 | 2.81 | 13.78 | 14.78 |
| Sagar     | Deori        | 19     | 20     | 0.38 | 0.4  | 2.6   | 2.8   |
|           | Kesli        | 15     | 16     | 0.29 | 0.31 | 2     | 2.1   |
|           |              | 34     | 36     | 0.67 | 0.71 | 4.6   | 4.9   |
| Sehore    | Ashta        | 37.75  | 49.13  | 0.75 | 0.98 | 5.17  | 6.73  |
|           | Budhni       | 15.68  | 20.41  | 0.31 | 0.41 | 2.15  | 2.8   |
|           | Ichawar      | 19.14  | 24.92  | 0.38 | 0.5  | 2.62  | 3.41  |
|           | Nasrullaganj | 8.67   | 9.39   | 0.43 | 0.47 | 0.85  | 0.92  |
|           | Sehore       | 41.43  | 53.92  | 0.83 | 1.08 | 5.68  | 7.39  |
|           |              | 122.67 | 157.77 | 2.7  | 3.44 | 16.47 | 21.25 |

|                          |             |       |    |      |     |      |      |
|--------------------------|-------------|-------|----|------|-----|------|------|
| Seoni                    | Ghansaur    |       |    |      |     |      |      |
|                          | Lakhnadon   | 3.78  |    | 0.01 |     | 0.5  |      |
| Umaria                   | Bandhogarh* |       |    |      |     |      |      |
|                          | Whole       |       |    |      |     |      |      |
|                          | District    | 12.51 | 14 | 0.6  | 0.7 | 2.45 | 2.68 |
| West Nimar<br>(Khargone) | Barwah      | 58.4  |    | 1.75 |     | 0.02 |      |
|                          | Bhagwanpura | 38.6  |    | 1.16 |     |      |      |
|                          | Bhikangaon  | 35.11 |    | 1.05 |     | 0.46 |      |
|                          | Jhirniya    | 40.35 |    | 1.21 |     |      |      |
|                          | Kasrawad    | 43.99 |    | 1.32 |     | 0.5  |      |
|                          | Khargone    | 41.03 |    | 3.13 |     | 0.53 |      |
|                          | Maheshwar   | 39.25 |    | 1.18 |     | 0.52 |      |



|        |        |      |      |
|--------|--------|------|------|
| Seagon | 16.69  | 0.5  |      |
|        | 313.42 | 11.3 | 2.03 |

\*Source: MPCB District environment plan

**Table A - 6 District-wise Status of Solid Waste Collection and Segregation Facilities in Narmada Basin, Madhya Pradesh**

| Collection of solid waste |           |             |                                     |                                                      |                                                   |                                             |                                                                                                                                     |
|---------------------------|-----------|-------------|-------------------------------------|------------------------------------------------------|---------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| S. No.                    | Districts | Block (ULB) | Segregation (Dry and wet) At Source | Waste Collection trolleys with separate Compartments | Mini Collection Trucks with separate compartments | Gaps and Challenges                         | References                                                                                                                          |
|                           |           | Alirajpur   | 89%                                 | 3                                                    | 6                                                 | required 3 more mini collection trucks.     |                                                                                                                                     |
| 1                         | Alirajpur | Bhavara     | 100%                                | 1                                                    | 1                                                 | 2 More mini collection trucks are required. | <a href="https://www.mppcb.mp.gov.in/pr oc/Tech/DEP%20Alirajpur.pdf">https://www.mppcb.mp.gov.in/pr oc/Tech/DEP%20Alirajpur.pdf</a> |
|                           |           | Jobat       | 70%                                 | 1                                                    | 1                                                 | 2 More mini collection trucks are required. |                                                                                                                                     |

|   |                          |          |      |            |            |                                                                       |                                                                                                                                                                                                 |
|---|--------------------------|----------|------|------------|------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 | Anuppur (Whole District) | District | NA   | NA         | NA         | More Collection trolleys are required                                 | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Anuppur&amp;pdf=/proc/Tech/DEP%20Anuppur.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Anuppur&amp;pdf=/proc/Tech/DEP%20Anuppur.pdf</a>   |
| 3 | Balaghat                 | Baihar   | 100% | 22         | sufficient | No Gap Identified                                                     | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Balaghat&amp;pdf=/proc/Tech/BALAGHAT_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Balaghat&amp;pdf=/proc/Tech/BALAGHAT_2023.pdf</a> |
|   |                          | Barwani  | 90%  | Sufficient | 9          | 6 more no mini collection trucks are required                         |                                                                                                                                                                                                 |
|   |                          | Niwali   | 50%  | 2          | 3          | 4 more collection trolleys and 3 mini collection trucks are required. |                                                                                                                                                                                                 |
|   |                          | Pansemal | 50%  | 4          | 3          | 4 more collection trolleys and 3 mini collection trucks are required. | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Barwani&amp;pdf=/proc/Tech/Badwani_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Barwani&amp;pdf=/proc/Tech/Badwani_2023.pdf</a>     |
| 4 | Barwani                  | Rajpur   | 50%  | 2          | 3          | 4 more collection trolleys and 2 mini collection trucks are required. |                                                                                                                                                                                                 |
|   |                          | Sendhwa  | 90%  | Sufficient | 9          | 6 more no mini collection trucks are required                         |                                                                                                                                                                                                 |
|   |                          | Thikiri  | 50%  | 2          | 3          | 4 more collection trolleys and 3 mini collection trucks are required. |                                                                                                                                                                                                 |

|   |                            |            |         |                    |                    |                                                                                                                                                                                               |                                                                                                                                                                                                         |
|---|----------------------------|------------|---------|--------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5 | Betul (whole District)     | Amla       | Partial | No Information     | No Information     | Smaller vehicles available with the ULBs' are required to make several trips for transportation of waste and At least 02 Waste transfer points to be developed in Betul Municipal Corporation | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Betul&amp;pdf=/proc/Tech/Betul_23.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Betul&amp;pdf=/proc/Tech/Betul_23.pdf</a>                         |
|   |                            | Betul      |         |                    |                    |                                                                                                                                                                                               |                                                                                                                                                                                                         |
|   |                            | Bhaisdehi  |         |                    |                    |                                                                                                                                                                                               |                                                                                                                                                                                                         |
|   |                            | Multai     |         |                    |                    |                                                                                                                                                                                               |                                                                                                                                                                                                         |
| 6 | Burhanpur                  | Shahpur    | 50%     | 8                  | 1                  | 8 Collection trolleys and 1 mini truck is required.                                                                                                                                           | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Burhanpur&amp;pdf=/proc/Tech/BURHANPUR_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Burhanpur&amp;pdf=/proc/Tech/BURHANPUR_2023.pdf</a>     |
|   |                            | Nepanagar  |         |                    |                    |                                                                                                                                                                                               |                                                                                                                                                                                                         |
|   |                            | Amarwara   |         |                    |                    |                                                                                                                                                                                               |                                                                                                                                                                                                         |
|   |                            | Junnardev  |         |                    |                    |                                                                                                                                                                                               |                                                                                                                                                                                                         |
| 7 | Chindwara (whole District) | Tamiya     | Partial | Sufficient in ULBs | Sufficient in ULBs | Mini Collection Trucks with separate compartments to be procured with 60:40 ratio along with 03 additional compartments for bio-medical, sanitary waste and domestic hazardous wastes.        | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Chhindwara&amp;pdf=/proc/Tech/CHHINDWARA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Chhindwara&amp;pdf=/proc/Tech/CHHINDWARA_2023.pdf</a> |
|   |                            | Jabera     |         |                    |                    |                                                                                                                                                                                               |                                                                                                                                                                                                         |
|   |                            | Tendukheda |         |                    |                    |                                                                                                                                                                                               |                                                                                                                                                                                                         |
|   |                            | Damoh      |         |                    |                    |                                                                                                                                                                                               |                                                                                                                                                                                                         |
| 8 | Damoh                      | Jabera     | NA      | NA                 | NA                 | NA                                                                                                                                                                                            | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Damoh&amp;pdf=/proc/Tech/Damoh_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Damoh&amp;pdf=/proc/Tech/Damoh_2023.pdf</a>                     |
|   |                            | Tendukheda | 100%    | 1                  | 2                  | 10 Collection trolleys and 1 mini truck is required.                                                                                                                                          |                                                                                                                                                                                                         |
| 9 | Dewas                      | Bagli      | 50%     | Sufficient         | 2                  | No Gap Identified                                                                                                                                                                             |                                                                                                                                                                                                         |

|    |                          |            |           |               |               |                                                                                     |                                                                                                                                                                                                                               |
|----|--------------------------|------------|-----------|---------------|---------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                          | Dewas      | 100%      | 180           | 56            | 15 Collection trolleys and 10 mini truck are required.                              | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dewas&amp;pdf=/proc/Tech/DEWAS_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dewas&amp;pdf=/proc/Tech/DEWAS_2023.pdf</a>                                           |
|    |                          | Kannod     | 50%       | Sufficient    | 3             | No Gap Identified                                                                   |                                                                                                                                                                                                                               |
|    |                          | Khategaon  | 50%       | Sufficient    | 5             | No Gap Identified                                                                   |                                                                                                                                                                                                                               |
|    |                          | Dhar       |           |               |               |                                                                                     |                                                                                                                                                                                                                               |
|    |                          | Dharampuri |           |               |               |                                                                                     |                                                                                                                                                                                                                               |
| 10 | Dhar (whole District)    | Gandhwani  | Partially | Yes available | Yes available | No Gap Identified                                                                   | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dhar&amp;pdf=/proc/Tech/DHAR_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dhar&amp;pdf=/proc/Tech/DHAR_2023.pdf</a>                                               |
|    |                          | Kukshi     |           |               |               |                                                                                     |                                                                                                                                                                                                                               |
|    |                          | Manawar    |           |               |               |                                                                                     |                                                                                                                                                                                                                               |
|    |                          | Sardarpur  |           |               |               |                                                                                     |                                                                                                                                                                                                                               |
| 11 | Dindori (whole District) | Dindori    | Partial   | Required      | Required      | More collection trolleys with compartments and mini collection trucks are required. | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dindori&amp;pdf=/proc/Tech/DINDORI_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dindori&amp;pdf=/proc/Tech/DINDORI_2023.pdf</a>                                   |
|    |                          | Shahpura   |           |               |               |                                                                                     |                                                                                                                                                                                                                               |
|    |                          | Harsud     | 50%       | 2             | 3             | 8 Collection trolleys and 7 mini truck are required.                                | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Khandwa%20(East%20Nimar)&amp;pdf=/proc/Tech/Khandwa_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Khandwa%20(East%20Nimar)&amp;pdf=/proc/Tech/Khandwa_2023.pdf</a> |
| 12 | Khandwa                  | Khandwa    | Partial   | 50            | 1             | 8 collection trolleys with compartments and 6 mini collection trucks are required.  |                                                                                                                                                                                                                               |

|    |            |             |      |                  |   |                                                                                    |                                                                                                                                                                                                               |
|----|------------|-------------|------|------------------|---|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |            | Pandhana    | 50%  | 2                | 3 | 8 collection trolleys with compartments and 3 mini collection trucks are required. |                                                                                                                                                                                                               |
|    |            | Harda       | 100% | 34 DTDC vehicles | 5 | No Gap Identified                                                                  |                                                                                                                                                                                                               |
| 13 | Harda      | Khirkhya    | 100% | 2 DTDC vehicles  | 5 | No Gap Identified                                                                  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Harda&amp;pdf=/proc/Tech/harda_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Harda&amp;pdf=/proc/Tech/harda_2023.pdf</a>                           |
|    |            | Timurni     | 100% | 2 DTDC vehicles  | 5 | No Gap Identified                                                                  |                                                                                                                                                                                                               |
|    |            | Babai       | 80%  | 2                | 3 | 1 collection trolleys with compartments and 2 mini collection trucks are required. |                                                                                                                                                                                                               |
| 14 | Hosangabad | Bankheri    | 80%  | 1                | 5 | 3 collection trolleys with compartments and 5 mini collection trucks are required. | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Hoshangabad&amp;pdf=/proc/Tech/Narmadapuram_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Hoshangabad&amp;pdf=/proc/Tech/Narmadapuram_2023.pdf</a> |
|    |            | Hoshangabad | 88%  | 40               | 7 | No Gap Identified                                                                  |                                                                                                                                                                                                               |
|    |            | Itarsi      | 85%  | 5                | 1 | 4 collection trolleys with compartments and 1 mini collection trucks are required. |                                                                                                                                                                                                               |

|    |                         |            |           |            |            |                                                                                       |                                                                                                                                                                                                 |
|----|-------------------------|------------|-----------|------------|------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                         | Piparia    | 85%       | 3          | 5          | 5 more no of mini collection trucks and 3 more waste collection trolleys are required |                                                                                                                                                                                                 |
|    |                         | Seonimalwa | 85%       | 3          | 5          | 3 collection trolleys with compartments and 5 mini collection trucks are required.    |                                                                                                                                                                                                 |
|    |                         | Sohagpur   | 70%       | 3          | 15         | No Gap Identified                                                                     |                                                                                                                                                                                                 |
| 15 | Indore                  | Mhow       | 75%       | Sufficient | Sufficient | No Gap Identified                                                                     | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Indore&amp;pdf=/proc/Tech/INDORE_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Indore&amp;pdf=/proc/Tech/INDORE_2023.pdf</a>         |
|    |                         | Jabalpur   | 100%      | Sufficient | Sufficient | No Gap Identified                                                                     |                                                                                                                                                                                                 |
|    |                         | Kundam     | 100%      |            |            | No Gap Identified                                                                     |                                                                                                                                                                                                 |
| 16 | Jabalpur                | Majholi    | 100%      | Sufficient | Sufficient | No Gap Identified                                                                     | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jabalpur&amp;pdf=/proc/Tech/Jabalpur_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jabalpur&amp;pdf=/proc/Tech/Jabalpur_2023.pdf</a> |
|    |                         | Patan      | 100%      | Sufficient | Sufficient | No Gap Identified                                                                     |                                                                                                                                                                                                 |
|    |                         | Shahpura   | 100%      | Sufficient | Sufficient | No Gap Identified                                                                     |                                                                                                                                                                                                 |
|    |                         | Shihora    | 100%      | Sufficient | Sufficient | No Gap Identified                                                                     |                                                                                                                                                                                                 |
| 17 | Jhabua (whole District) | Jhabua     |           |            |            | No Gap Identified                                                                     | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jhabua&amp;pdf=/proc/Tech/JHABUA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jhabua&amp;pdf=/proc/Tech/JHABUA_2023.pdf</a>         |
|    |                         | Ranapur    | Partial   | Sufficient | Sufficient | No Gap Identified                                                                     |                                                                                                                                                                                                 |
| 18 |                         | Bahuriband | Partially |            | 50         | No Gap Identified                                                                     |                                                                                                                                                                                                 |

|    |                        |             |      |                                  |            |                                                                            |                                                                                                                                                                                                             |
|----|------------------------|-------------|------|----------------------------------|------------|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 19 | Katni (whole District) | Dhimarkhera |      | Sufficient in all ULBs           |            | No Gap Identified                                                          | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Katni&amp;pdf=/proc/Tech/KATNI_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Katni&amp;pdf=/proc/Tech/KATNI_2023.pdf</a>                         |
|    |                        | Rathi       |      |                                  |            | No Gap Identified                                                          |                                                                                                                                                                                                             |
|    | Mandla                 | Bichhiya    | 100% | Sufficient                       | Sufficient | No Gap Identified                                                          | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Mandla&amp;pdf=/proc/Tech/MANDLA.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Mandla&amp;pdf=/proc/Tech/MANDLA.pdf</a>                               |
|    |                        | Mandla      | 100% | Sufficient                       | Sufficient | No Gap Identified                                                          |                                                                                                                                                                                                             |
|    |                        | Nainpur     | 100% | Sufficient                       | Sufficient | No Gap Identified                                                          |                                                                                                                                                                                                             |
|    |                        | Niwas       | 100% | Sufficient                       | Sufficient | No Gap Identified                                                          |                                                                                                                                                                                                             |
|    |                        | Gadarwara   | 100% | 8                                | Sufficient | No Gap Identified                                                          |                                                                                                                                                                                                             |
|    |                        | Gotegaon    | 100% | 7 WC trolleys and 21 Tricycle    | Sufficient | No Gap Identified                                                          |                                                                                                                                                                                                             |
| 20 | Narshingpur            | Kareli      | 100% | Sufficient                       | Sufficient | No Gap Identified                                                          | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Narsinghpur&amp;pdf=/proc/Tech/NARSINGHPUR_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Narsinghpur&amp;pdf=/proc/Tech/NARSINGHPUR_2023.pdf</a> |
|    |                        | Narshingpur | 100% | 11 WC trolleys and 50no Tricycle | Sufficient | No Gap Identified                                                          |                                                                                                                                                                                                             |
|    |                        | Tendukheda  | 100% | 3 WC trolleys and 2 no Tricycle  | Sufficient | 02 no. of Waste Collection Trolleys and 05 Tricycle/Handcart are required. |                                                                                                                                                                                                             |
| 21 | Raisen                 | Bareilly    | 100% | 3                                | 6          | No Gap Identified                                                          |                                                                                                                                                                                                             |

|    |        |              |      |            |            |                                                                                    |                                                                                                                                                                                         |
|----|--------|--------------|------|------------|------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |        | Begamganj    | 100% | 0          | 9          | 2 collection trolleys with compartments are required.                              |                                                                                                                                                                                         |
|    |        | Gairatganj   | 100% | 6          | 2          | No Gap Identified                                                                  |                                                                                                                                                                                         |
|    |        | Goharganj    | NA   | NA         | NA         | NA                                                                                 | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Raisen&amp;pdf=/proc/Tech/Raisen_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Raisen&amp;pdf=/proc/Tech/Raisen_2023.pdf</a> |
|    |        | Raisen       | 90%  | 3          | 13         | 2 collection trolleys with compartments and 6 mini collection trucks are required. |                                                                                                                                                                                         |
|    |        | Silvani      | 100% | 4          | 3          | No Gap Identified                                                                  |                                                                                                                                                                                         |
|    |        | Udaipura     | 100% | 5          | 3          | No Gap Identified                                                                  |                                                                                                                                                                                         |
| 22 | Sagar  | Deori        | 100% | Sufficient | Sufficient | No Gap Identified                                                                  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sagar&amp;pdf=/proc/Tech/Sagar_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sagar&amp;pdf=/proc/Tech/Sagar_2023.pdf</a>     |
|    |        | Kesli        | NA   | NA         | NA         | NA                                                                                 |                                                                                                                                                                                         |
|    |        | Ashta        | 80%  | Sufficient | Sufficient | No Gap Identified                                                                  |                                                                                                                                                                                         |
|    |        | Budhni       | 100% | Sufficient | Sufficient | No Gap Identified                                                                  |                                                                                                                                                                                         |
| 23 | Sehore | Ichawar      | YES  | Yes        | YES        | NA                                                                                 | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sehore&amp;pdf=/proc/Tech/SEHORE_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sehore&amp;pdf=/proc/Tech/SEHORE_2023.pdf</a> |
|    |        | Nasrullaganj | 80%  | 1          | 5          | 3 collection trolleys with compartments and 5 mini collection trucks are required. |                                                                                                                                                                                         |



|    |            |             |         |              |              |                                                                                          |                                                                                                                                                                                           |
|----|------------|-------------|---------|--------------|--------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |            | Sehore      | 70%     | 5            | 1            | 6 collection trolleys with compartments and 4 mini collection trucks are required.       |                                                                                                                                                                                           |
| 24 | Seoni      | Ghansaur    | 45%     | 20%          | 10%          | Enough vehicles are required                                                             | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Seoni&amp;pdf=/proc/Tech/Seoni_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Seoni&amp;pdf=/proc/Tech/Seoni_2023.pdf</a>       |
|    |            | Lakhnadon   | 50%     | Sufficient   | Sufficient   | No Gap Identified                                                                        |                                                                                                                                                                                           |
| 25 | Umaria     | Bandhogarh  | Partial | Insufficient | Insufficient | More collection trolleys with separate compartments are needed at all 4 ULBs in district | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Umaria&amp;pdf=/proc/Tech/UMARIYA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Umaria&amp;pdf=/proc/Tech/UMARIYA_2023.pdf</a> |
|    |            | Barwah      | 50%     | 2            | 1            | 2 collection trolleys and 2 mini collection trucks are required                          |                                                                                                                                                                                           |
|    |            | Bhagwanpura | NA      | NA           | NA           | NA                                                                                       |                                                                                                                                                                                           |
|    |            | Bhikangaon  | 50%     | 1            | 0            | 2 collection trolleys and 1 mini collection trucks are required                          | <a href="https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Damoh.pdf">https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Damoh.pdf</a>                                                                 |
| 26 | West Nimar | Jhirniya    | NA      | NA           | NA           | NA                                                                                       |                                                                                                                                                                                           |
|    |            | Kasrawas    | 50%     | 2            | Not required | No Gap Identified                                                                        |                                                                                                                                                                                           |
|    |            | Khargone    | 100%    | Sufficient   | 4            | No Gap Identified                                                                        |                                                                                                                                                                                           |
|    |            | Maheshwar   | 50%     | 2            | Not required | No Gap Identified                                                                        |                                                                                                                                                                                           |
|    |            | Seagon      | NA      | NA           | NA           | NA                                                                                       |                                                                                                                                                                                           |

\*Source: MPCB District environment plan

*Table A - 7 District-wise Status of Solid Waste Treatment and Disposal Facilities in Narmada Basin, Madhya Pradesh*

| Waste Treatment and Disposal |           |             |                                            |                 |                                             |                                         |                                                                     |                                                                                                                                   |
|------------------------------|-----------|-------------|--------------------------------------------|-----------------|---------------------------------------------|-----------------------------------------|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| S.No.                        | Districts | Block (ULB) | Wet waste: Composting                      | Bio-methanation | Dry waste: Material recovery Facility (MRF) | Non-Recyclable Waste: Sanitary Landfill | Gaps and Challenges                                                 | References                                                                                                                        |
| 1                            | Alirajpur | Alirajpur   | Composting units with 5.19 tonnes capacity | No              | 1 MRF partially functioning                 | Not available                           | 100% wet waste disposal by composting and Need of Sanitary Landfill | <a href="https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Alirajpur.pdf">https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Alirajpur.pdf</a> |
|                              |           | Bhavara     | Not available                              | No              | Not available                               | Not available                           | Treatment and disposal facilities are required.                     |                                                                                                                                   |
|                              |           | Jobat       | Not available                              | No              | Not available                               | Not available                           | Construction of proper composting facility, MRF and                 |                                                                                                                                   |

|   |                          |          |                                                                    |               |                        |               |                                                                                  |                                                                                                                                                                                                 |
|---|--------------------------|----------|--------------------------------------------------------------------|---------------|------------------------|---------------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                          |          |                                                                    |               |                        |               | sanitary landfill<br>required                                                    |                                                                                                                                                                                                 |
| 2 | Anuppur (Whole District) | District | Composting wet organic waste mixed with cow dung to create manure. | No            | MRF facility exists    | Available     | required training to site workers to utilize these facilities in full efficiency | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Anuppur&amp;pdf=/proc/Tech/DEP%20Anuppur.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Anuppur&amp;pdf=/proc/Tech/DEP%20Anuppur.pdf</a>   |
| 3 | Balaghat                 | Baihar   | Not available                                                      | Not available | Not available          | Not available | Construction of proper composting facility, MRF and sanitary landfill required   | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Balaghat&amp;pdf=/proc/Tech/BALAGHAT_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Balaghat&amp;pdf=/proc/Tech/BALAGHAT_2023.pdf</a> |
| 4 | Barwani                  | Barwani  | 110composting pits are available                                   | Not available | MRF facility available | Not available | Required sanitary landfill for non-recyclable waste                              | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Barwani&amp;pdf=/proc/Tech/Badwani_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Barwani&amp;pdf=/proc/Tech/Badwani_2023.pdf</a>     |
|   |                          | Niwali   | Not available                                                      | Not available | Not available          | Not available | Construction of proper composting facility, MRF and sanitary landfill required   |                                                                                                                                                                                                 |

|   |                        |           |                                  |               |                                    |               |                                                                                |                                                                                                                                                                                 |
|---|------------------------|-----------|----------------------------------|---------------|------------------------------------|---------------|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5 | Betul (Whole District) | Pansemal  | Not available                    | Not available | Not available                      | Not available | Construction of proper composting facility, MRF and sanitary landfill required |                                                                                                                                                                                 |
|   |                        | Rajpur    | Not available                    | Not available | Not available                      | Not available | Construction of proper composting facility, MRF and sanitary landfill required |                                                                                                                                                                                 |
|   |                        | Sendhwa   | 110composting pits are available | Not available | MRF facility available             | Not available | Required sanitary landfill for non-recyclable waste                            |                                                                                                                                                                                 |
|   |                        | Thikiri   | Not available                    | Not available | Not available                      | Not available | Construction of proper composting facility, MRF and sanitary landfill required |                                                                                                                                                                                 |
|   |                        | Amla      |                                  |               |                                    |               |                                                                                |                                                                                                                                                                                 |
|   |                        | Betul     | Not available                    | Not available | Only Betul and Multai have the MRF | Not available | Composting and MRF facility is required and 02 SLF to be                       | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Betul&amp;pdf=/proc/Tech/Betul_23.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Betul&amp;pdf=/proc/Tech/Betul_23.pdf</a> |
|   |                        | Bhaisdehi |                                  |               |                                    |               |                                                                                |                                                                                                                                                                                 |

|   |                            |            |                             |               |                       |                                  |                                                                                                                                                                            |                                                                                                                                                                                                         |
|---|----------------------------|------------|-----------------------------|---------------|-----------------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                            | Multai     |                             |               | facility available    |                                  | developed to cater the command areas.                                                                                                                                      |                                                                                                                                                                                                         |
|   |                            | Shahpur    |                             |               |                       |                                  |                                                                                                                                                                            |                                                                                                                                                                                                         |
| 6 | Burhanpur                  | Nepanagar  | Not Available               | Not available | Not available         | Not available                    | Construction of proper composting facility, MRF and sanitary landfill required                                                                                             | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Burhanpur&amp;pdf=/proc/Tech/BURHANPUR_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Burhanpur&amp;pdf=/proc/Tech/BURHANPUR_2023.pdf</a>     |
|   |                            | Amarwara   |                             |               |                       |                                  | Proposal to be set up at the site identified and allocated for MSW disposal. In villages NADEP compost, community soak pits etc. has been constructed for waste management |                                                                                                                                                                                                         |
| 7 | Chindwara (Whole District) | Junnardev  | Available at all ULB levels | Not available | Available at all ULBs | Not available at any of the ULBs |                                                                                                                                                                            | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Chhindwara&amp;pdf=/proc/Tech/CHHINDWARA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Chhindwara&amp;pdf=/proc/Tech/CHHINDWARA_2023.pdf</a> |
|   |                            | Tamiya     |                             |               |                       |                                  |                                                                                                                                                                            |                                                                                                                                                                                                         |
|   |                            | Jabera     | Not available               | Not available | Not Available         | Not available                    |                                                                                                                                                                            |                                                                                                                                                                                                         |
| 8 | Damoh                      | Tendukheda | Not Available               | Not Available | Not Available         | Not Available                    | Construction of proper composting facility, MRF and                                                                                                                        | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Damoh&amp;pdf=/proc/Tech/Damoh_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Damoh&amp;pdf=/proc/Tech/Damoh_2023.pdf</a>                     |

|    |                          |                    |               |               |                     |                                             |                                                                                                                                                                                                                                                                                     |
|----|--------------------------|--------------------|---------------|---------------|---------------------|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                          |                    |               |               |                     | sanitary landfill<br>required               |                                                                                                                                                                                                                                                                                     |
|    |                          | Bagli              | Not Available | Not Available | Not<br>Available    | Not Available                               | required proper<br>composting facility,<br>MRF and sanitary<br>landfill                                                                                                                                                                                                             |
| 9  | Dewas                    | Dewas              | Not Available | Not Available | 2 MRFs<br>available | Not Available                               | Construction of<br>proper composting<br>facility and sanitary<br>landfill required<br><a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dewas&amp;pdf=/proc/Tech/DEWAS_2023.pdf">https://www.mppcb.mp.gov.in/<br/>PdfView.aspx?h=Dewas&amp;pdf=<br/>/proc/Tech/DEWAS_2023.pdf</a> |
|    |                          | Kannod             | Not Available | Not Available | Not<br>Available    | Not Available                               | required proper<br>composting facility,<br>MRF and sanitary<br>landfill                                                                                                                                                                                                             |
|    |                          | Khategaon          | Not Available | Not Available | Not<br>Available    | Not Available                               | required proper<br>composting facility,<br>MRF and sanitary<br>landfill                                                                                                                                                                                                             |
| 10 | Dhar (Whole<br>District) | Dhar<br>Dharampuri | Not Available | Not Available | MRF<br>facility     | Not Available<br>all ULBs has<br>dump sites | Construction of<br>proper composting<br><a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dhar&amp;pdf=/proc/Tech/DHAR_2023.pdf">https://www.mppcb.mp.gov.in/<br/>PdfView.aspx?h=Dhar&amp;pdf=/p<br/>roc/Tech/DHAR_2023.pdf</a>                                                   |

|    |                          |           |                                        |               |                                    |                       |                                                                |                                                                                                                                                                                                                               |
|----|--------------------------|-----------|----------------------------------------|---------------|------------------------------------|-----------------------|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                          | Gandhwani |                                        |               | available in                       |                       | facility and sanitary                                          |                                                                                                                                                                                                                               |
|    |                          | Kukshi    |                                        |               | all ULBs                           |                       | landfill required                                              |                                                                                                                                                                                                                               |
|    |                          | Manawar   |                                        |               |                                    |                       |                                                                |                                                                                                                                                                                                                               |
|    |                          | Sardarpur |                                        |               |                                    |                       |                                                                |                                                                                                                                                                                                                               |
| 11 | Dindori (Whole District) | Dindori   | Available                              | Not available | MRF facility available in all ULBs | Available at all ULBs | Functional Upgradation in Technologies are required            | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dindori&amp;pdf=/proc/Tech/DINDORI_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dindori&amp;pdf=/proc/Tech/DINDORI_2023.pdf</a>                                   |
|    |                          | Shahpura  |                                        |               |                                    |                       |                                                                |                                                                                                                                                                                                                               |
|    |                          | Harsud    | Not available                          | Not available | Not available                      | Not available         | required proper composting facility, MRF and sanitary landfill |                                                                                                                                                                                                                               |
| 12 | Khandwa                  | Khandwa   | 8 Nos of composting pits are available | Not available | MRF facility is Available          | Not Available         | Sanitary landfill facility is required                         | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Khandwa%20(East%20Nimar)&amp;pdf=/proc/Tech/Khandwa_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Khandwa%20(East%20Nimar)&amp;pdf=/proc/Tech/Khandwa_2023.pdf</a> |
|    |                          | Pandhana  | Not available                          | Not available | Not available                      | Not available         | required proper composting facility, MRF and sanitary landfill |                                                                                                                                                                                                                               |

|    |            |          |               |               |                                                                                    |                               |                                                                                       |                                                                                                                                                                                                                              |
|----|------------|----------|---------------|---------------|------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |            | Harda    | Yes available | Not available | Yes,<br>temporary<br>facility is<br>available                                      | Not available                 | composting facility<br>Upgradation, MRF<br>and sanitary landfill<br>facility required |                                                                                                                                                                                                                              |
| 13 | Harda      | Khirkiya | Yes available | Not available | Yes<br>available                                                                   | Not available                 | MRF and sanitary<br>landfill facility<br>required                                     | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Harda&amp;pdf=/proc/Tech/harda_2023.pdf">https://www.mppcb.mp.gov.in/<br/>PdfView.aspx?h=Harda&amp;pdf=<br/>proc/Tech/harda_2023.pdf</a>                                 |
|    |            | Timurni  | Not available | Not available | Yes,<br>temporary<br>facility is<br>available                                      | Not available                 | required proper<br>composting facility,<br>MRF and sanitary<br>landfill               |                                                                                                                                                                                                                              |
| 14 | Hosangabad | Babai    | Available     | Not available | MRF<br>available<br>but<br>Refused<br>derive<br>Facility<br>(RDF) not<br>available | Not available                 | Composting<br>technology<br>Upgradation and<br>sanitary landfill<br>required          | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Hoshangabad&amp;pdf=/proc/Tech/Narmadapuram_2023.pdf">https://www.mppcb.mp.gov.in/<br/>PdfView.aspx?h=Hoshangabad<br/>&amp;pdf=/proc/Tech/Narmadapur<br/>am_2023.pdf</a> |
|    |            | Bankheri | Available     | Not available | MRF<br>available<br>but<br>Refused<br>derive                                       | Proposed but<br>not available | Sanitary landfill<br>required                                                         |                                                                                                                                                                                                                              |



|    |        |             |                                                             |               |                                                        |                          |                                                                                                                                                                                                   |
|----|--------|-------------|-------------------------------------------------------------|---------------|--------------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |        |             |                                                             |               | Facility<br>(RDF) not<br>available                     |                          |                                                                                                                                                                                                   |
|    |        |             |                                                             |               |                                                        | Composting<br>technology |                                                                                                                                                                                                   |
|    |        | Hoshangabad | Yes Available                                               | Not available | MRF<br>available                                       | Not available            | Upgradation and<br>sanitary landfill<br>required                                                                                                                                                  |
|    |        | Itarsi      | Yes available                                               | Not available | Available                                              | Not available            | Need of sanitary<br>Landfill                                                                                                                                                                      |
|    |        | Piparia     | Available                                                   | Not available | Available                                              | Not available            | Need of sanitary<br>Landfill                                                                                                                                                                      |
|    |        | Seonimalwa  | Available                                                   | Not available | Yes<br>Available                                       | Not available            | sanitary Landfill<br>required                                                                                                                                                                     |
|    |        | Sohagpur    | Yes available                                               | Not available | Available                                              | Not available            | Need of sanitary<br>Landfill                                                                                                                                                                      |
| 15 | Indore | Mhow        | Adequate<br>capacity<br>composting<br>pits are<br>available | Not available | 03 different<br>grades<br>MRF<br>machines<br>available | Not available            | Construction of<br>sanitary landfills is<br>required.                                                                                                                                             |
|    |        |             |                                                             |               |                                                        |                          | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Indore&amp;pdf=/proc/Tech/INDORE_2023.pdf">https://www.mppcb.mp.gov.in/<br/>PdfView.aspx?h=Indore&amp;pdf=<br/>/proc/Tech/INDORE_2023.pdf</a> |

|    |          |          |                                  |               |               |                               |                                                                               |                                                                                                                                                                                                 |
|----|----------|----------|----------------------------------|---------------|---------------|-------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 16 | Jabalpur | Jabalpur | Sent to waste to energy plant    | Not available | available     | available                     | No Gap                                                                        | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jabalpur&amp;pdf=/proc/Tech/Jabalpur_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jabalpur&amp;pdf=/proc/Tech/Jabalpur_2023.pdf</a> |
|    |          | Kundam   | Not available                    | Not available | Not Available | Not available                 |                                                                               |                                                                                                                                                                                                 |
|    |          | Majholi  | Not available                    | Not Available | not available | Not available                 | Wet, dry and non-recyclable waste treatment and disposal facility is required |                                                                                                                                                                                                 |
|    |          | Patan    | Composting pits are installed    | Not Available | yes available | Not available                 | Sanitary landfill is required for inert and non-recyclable wastes             |                                                                                                                                                                                                 |
|    |          | Shahpura | Not available                    | not available | not available | Not available                 | Wet, dry and non-recyclable waste treatment and disposal facility is required |                                                                                                                                                                                                 |
|    |          | Shihora  | linked with MSW processing Plant | Not available | available     | Sent to waste to energy plant | No Gap                                                                        |                                                                                                                                                                                                 |

|    |                         |             |                                              |               |                                       |                                                                  |                                                                               |                                                                                                                                                                                         |
|----|-------------------------|-------------|----------------------------------------------|---------------|---------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                         |             | located at<br>Katni                          |               |                                       |                                                                  |                                                                               |                                                                                                                                                                                         |
| 17 | Jhabua (Whole District) | Jhabua      | No bulk wet waste generators in the district | Not available | MRF facility is available in all ULBs | No sanitary landfill available in district                       | Composting Facility and sanitary landfill required in the district.           | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jhabua&amp;pdf=/proc/Tech/JHABUA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jhabua&amp;pdf=/proc/Tech/JHABUA_2023.pdf</a> |
|    |                         | Ranapur     |                                              |               |                                       |                                                                  |                                                                               |                                                                                                                                                                                         |
| 18 | Katni (Whole District)  | Bahuriband  |                                              |               |                                       | All ULBs have a single sanitary landfill site at Katni MSW plant | Composting facility is required                                               | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Katni&amp;pdf=/proc/Tech/KATNI_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Katni&amp;pdf=/proc/Tech/KATNI_2023.pdf</a>     |
|    |                         | Dhimarkhera | Not available                                | Not available | MRF facility is available in all ULBs |                                                                  |                                                                               |                                                                                                                                                                                         |
|    |                         | Rathi       |                                              |               |                                       |                                                                  |                                                                               |                                                                                                                                                                                         |
| 19 | Mandla                  | Bichhiya    | Not available                                | Not available | Not available                         | Not available                                                    | Wet, dry and non-recyclable waste treatment and disposal facility is required | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Mandla&amp;pdf=/proc/Tech/MANDLA.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Mandla&amp;pdf=/proc/Tech/MANDLA.pdf</a>           |
|    |                         | Mandla      | Not available                                | Not available | Available                             | Not available                                                    | Composting Facility and sanitary landfill required.                           |                                                                                                                                                                                         |

|    |             |             |               |               |                    |               |                                                                              |
|----|-------------|-------------|---------------|---------------|--------------------|---------------|------------------------------------------------------------------------------|
| 20 | Narshingpur | Nainpur     | Not available | Not available | 1 MRF is available | Not available | Composting Facility and sanitary landfill required.                          |
|    |             | Niwas       | Not available | Not available | 1 MRF is available | Not available | Composting Facility and sanitary landfill required.                          |
|    |             | Gadarwara   | Yes available | Not available | Yes available      | Not available | Sanitary Landfill is required                                                |
|    |             | Gotegaon    | Not available | Not available | available          | Not available | composting facility Upgradation, MRF and sanitary landfill facility required |
|    |             | Kareli      | Not available | Not available | Not available      | Not available | composting facility Upgradation, MRF and sanitary landfill facility required |
|    |             | Narshingpur | Yes available | Not available | available          | Not available | Sanitary Landfill is required                                                |
|    |             | Tendukheda  | Not available | Not available | Not available      | Not available | composting facility Upgradation, MRF                                         |

[https://www.mppcb.mp.gov.in/PdfView.aspx?h=Narsinghpur&pdf=/proc/Tech/NARSINGH PUR\\_2023.pdf](https://www.mppcb.mp.gov.in/PdfView.aspx?h=Narsinghpur&pdf=/proc/Tech/NARSINGH PUR_2023.pdf)

|    |        |            |               |               |                  |               |                                         |                                                                                                                                                                                         |
|----|--------|------------|---------------|---------------|------------------|---------------|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |        |            |               |               |                  |               | and sanitary landfill facility required |                                                                                                                                                                                         |
|    |        | Bareli     | Yes available | Not available | Available        | Not available | Sanitary landfill is required           |                                                                                                                                                                                         |
|    |        | Begamganj  | Yes available | Not available | Not available    | Not available | Sanitary landfill is required           |                                                                                                                                                                                         |
|    |        | Gairatganj | Yes available | Not available | Available        | Not available | Sanitary landfill is required           |                                                                                                                                                                                         |
| 21 | Raisen | Goharganj  |               |               |                  |               |                                         | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Raisen&amp;pdf=/proc/Tech/Raisen_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Raisen&amp;pdf=/proc/Tech/Raisen_2023.pdf</a> |
|    |        | Raisen     | Yes available | Not available | Available        | Not available | Sanitary landfill is required           |                                                                                                                                                                                         |
|    |        | Silvani    | Yes available | Not available | Not available    | Not available | MRF and sanitary landfill required.     |                                                                                                                                                                                         |
|    |        | Udaipura   | Yes available | Not available | Yes available    | Not available | Sanitary landfill is required           |                                                                                                                                                                                         |
|    |        | Deori      | Yes available | Not available | MRF is available | Yes available | No Gap                                  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sagar&amp;pdf=/proc/Tech/Sagar_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sagar&amp;pdf=/proc/Tech/Sagar_2023.pdf</a>     |
| 22 | Sagar  | Kesli      | Not available | Not available | Not Available    | Not available | Not available                           |                                                                                                                                                                                         |

|    |        |              |               |               |               |               |                                                          |                                                                                                                                                                                         |
|----|--------|--------------|---------------|---------------|---------------|---------------|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 23 | Sehore | Ashta        | Not available | Not available | Not available | Not available | Composting Facility, MRF and sanitary landfill required. | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sehore&amp;pdf=/proc/Tech/SEHORE_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sehore&amp;pdf=/proc/Tech/SEHORE_2023.pdf</a> |
|    |        | Budhni       | Not available | Not available | Available     | Not available | Composting Facility and sanitary landfill required.      |                                                                                                                                                                                         |
|    |        | Ichawar      |               |               |               |               |                                                          |                                                                                                                                                                                         |
|    |        | Nasrullaganj | Not available | Not available | Available     | Not available | sanitary landfill required.                              |                                                                                                                                                                                         |
|    |        | Sehore       | Not available | Not available | Available     | Not available | Composting Facility and sanitary landfill required.      |                                                                                                                                                                                         |
| 24 | Seoni  | Ghansaur     | Not available | Not available | Not available | Not available | Composting Facility MRF and sanitary landfill required.  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Seoni&amp;pdf=/proc/Tech/Seoni_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Seoni&amp;pdf=/proc/Tech/Seoni_2023.pdf</a>     |
|    |        | Lakhnadon    | Not available | Not available | Not available | Not available | Composting Facility MRF and                              |                                                                                                                                                                                         |

|    |            |                             |                       |               |                                              |               |                                                              |                                                                                                                                                                                           |
|----|------------|-----------------------------|-----------------------|---------------|----------------------------------------------|---------------|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |            |                             |                       |               |                                              |               | sanitary landfill required.                                  |                                                                                                                                                                                           |
| 25 | Umaria     | Bandhogarh (Whole District) | Available in all ULBs | Not available | MRF facilities exist in all ULBs of district | Yes available | Facilities need upgradation                                  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Umaria&amp;pdf=/proc/Tech/UMARIYA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Umaria&amp;pdf=/proc/Tech/UMARIYA_2023.pdf</a> |
|    |            | Barwah                      | Not available         | Not available | Not available                                | Not available | Composting Facility, MRF and sanitary landfill are required. |                                                                                                                                                                                           |
|    |            | Bhagwanpura                 | Not available         | Not available | Not Available                                | Not available | Not available                                                |                                                                                                                                                                                           |
| 26 | West Nimar | Bhikangaon                  | Not available         | Not available | Not Available                                | Not Required  | Composting Facility and MRF facility required.               | <a href="https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Damoh.pdf">https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Damoh.pdf</a>                                                                 |
|    |            | Jhirmiya                    | Not available         | Not available | Not Available                                | Not available | Not available                                                |                                                                                                                                                                                           |
|    |            | Kasrawas                    | Not available         | Not available | Not available                                | Not required  | Composting Facility, MRF and sanitary landfill are required. |                                                                                                                                                                                           |

|           |               |               |                    |               |                                                                       |
|-----------|---------------|---------------|--------------------|---------------|-----------------------------------------------------------------------|
| Khargone  | Yes available | Not available | 2 MRF<br>Available | Not available | sanitary landfill<br>required.                                        |
| Maheshwar | Not available | Not available | Not<br>Available   | Not available | Composting<br>Facility, MRF and<br>sanitary landfill are<br>required. |
| Seagon    | Not available | Not available | Not<br>Available   | Not available | Not available                                                         |

\*Source: MPCB District environment plan



*Table A - 8 Comprehensive overview of legacy waste dumpsites and projected timelines for complete processing in Narmada basin ULBs*

| District                      | Tehsil / ULB | Legacy Waste<br>(MT) | Status                            | Date   |
|-------------------------------|--------------|----------------------|-----------------------------------|--------|
| Alirajpur                     | Alirajpur    | 24,858               | Work Started                      | 25-Jan |
| Alirajpur                     | Bhavra       | 11,091               | Work Started                      | 25-Mar |
| Alirajpur                     | Jobat        | 18,304               | Work Started                      | 25-Mar |
| Barwani                       | Badwani      | 37,141               | Work Started                      | 25-Mar |
| Barwani                       | Rajpur       | 27,476               | Work Started                      | 25-Mar |
| Betul                         | Multai       | 16,405               | Work Started                      | 24-Nov |
| Betul                         | Betul        | 1,33,958             | Work Started                      | 25-Mar |
| Burhanpur                     | Nepanagar    | 44,249               | Financial Evaluation<br>Pending   | 25-May |
| Dewas                         | Dewas        | 90,183               | Work Started                      | 25-Jan |
| Dewas                         | Khategaon    | 24,889               | Work Started                      | 25-Jan |
| Dhar                          | Dhar         | 1,55,065             | Work Started                      | 24-Nov |
| Dhar                          | Kukshi       | 43,830               | Work Started                      | 25-Mar |
| Dhar                          | Manawar      | 59,292               | Work Started                      | 25-Mar |
| Dhar                          | Pithampur    | 35,716               | Received at State<br>SLTC Pending | 25-May |
| Harda                         | Harda        | 14,678               | Work Started                      | 24-Nov |
| Harda                         | Timarni      | 4,692                | Received at State<br>SLTC Pending | 25-May |
| Hoshangabad<br>(Narmadapuram) | Seoni Malwa  | 21,207               | Work Started                      | 25-Mar |
| Hoshangabad<br>(Narmadapuram) | Itarsi       | 31,438               | Work Started                      | 25-Mar |
| Hoshangabad<br>(Narmadapuram) | Betul (part) | 1,33,958             | Work Started                      | 25-Mar |
| Hoshangabad<br>(Narmadapuram) | Narmadapuram | 62,296               | Work Started                      | 25-Mar |
| Hoshangabad<br>(Narmadapuram) | Sohagpur     | 11,730               | Financial Evaluation<br>Pending   | 25-May |

|          |                                          |          |                                   |        |
|----------|------------------------------------------|----------|-----------------------------------|--------|
| Indore   | Dhar<br>(repetition but<br>basin linked) | 1,55,065 | Work Started                      | 24-Nov |
| Indore   | Barwaha                                  | 54,268   | Work Started                      | 25-Jan |
| Indore   | Mandleshwar                              | 13,630   | Work Started                      | 25-Jan |
| Indore   | Maheshwar                                | 42,680   | Work Started                      | 25-Jan |
| Indore   | Alirajpur<br>(repeated,<br>basin linked) | 24,858   | Work Started                      | 25-Jan |
| Indore   | Jhabua                                   | 63,283   | Work Started                      | 25-Mar |
| Indore   | Thandla                                  | 20,583   | Work Started                      | 25-Mar |
| Indore   | Ranapur                                  | 36,988   | Financial Evaluation<br>Pending   | 25-May |
| Indore   | Pithampur                                | 35,716   | Received at State<br>SLTC Pending | 25-May |
| Indore   | Mhowgaon                                 | 20,383   | Received at State<br>SLTC Pending | 25-May |
| Indore   | Petlawad                                 | 31,489   | Received at State<br>SLTC Pending | 25-May |
| Indore   | Chhanera                                 | 24,172   | Received at State<br>SLTC Pending | 25-May |
| Indore   | Bhikangaon                               | 35,332   | Received at State<br>SLTC Pending | 25-May |
| Indore   | Betma                                    | 28,913   | Received at State<br>SLTC Pending | 25-May |
| Indore   | Kasrawad                                 | 17,641   | Received at State<br>SLTC Pending | 25-May |
| Jabalpur | Balaghat                                 | 65,761   | Work Started                      | 25-Mar |
| Jabalpur | Mandla                                   | 60,901   | Work Started                      | 25-Jan |
| Jabalpur | Nainpur                                  | 17,440   | Work Started                      | 25-Jan |
| Jabalpur | Pandhurna                                | 45,739   | Work Started                      | 25-Mar |
| Jabalpur | Junnardeo                                | 8,645    | Received at State<br>SLTC Pending | 25-May |

|          |                                                        |          |                                   |        |
|----------|--------------------------------------------------------|----------|-----------------------------------|--------|
| Jabalpur | Seoni                                                  | 1,57,664 | Technical Pending                 | 25-Jul |
| Mandla   | Mandla<br>(district-level<br>overlap with<br>Jabalpur) | 60,901   | Work Started                      | 25-Jan |
| Raisen   | Mandideep                                              | 83,617   | Work Started                      | 24-Nov |
| Raisen   | Bareli                                                 | 16,436   | Work Started                      | 25-Jan |
| Sehore   | Nasrullaganj                                           | 12,636   | Work Started                      | 25-Mar |
| Sagar    | Jatara                                                 | 10,358   | Work Started                      | 24-Nov |
| Sagar    | Hatta                                                  | 6,799    | Work Started                      | 25-Jan |
| Sagar    | Damoh                                                  | 9,289    | Financial Evaluation<br>Pending   | 25-May |
| Sagar    | Badagaon                                               | 1,958    | Received at State<br>SLTC Pending | 25-May |

*Sources: Six Monthly Progress Report by Govt. of Madhya Pradesh in OA No. 606 of 2018 for State of Madhya Pradesh (Compliance of MSW Management Rules, 2016 and Other Environmental Issues), National Green Tribunal, September 2025*

**Table A - 9 Wet waste processing facilities under the Narmada River basin ULBs**

| S.No | District<br>Name | ULB<br>Code | ULB Name      | Plant Type       | To | Sub Category                                |
|------|------------------|-------------|---------------|------------------|----|---------------------------------------------|
| 1    | Alirajpur        | 802433      | Alirajpur (M) | Waste<br>Compost |    | Aerobic (Windrow<br>Compost) Without<br>RDF |
| 2    | Alirajpur        | 802432      | Jobat (NP)    | Waste<br>Compost |    | Aerobic (Windrow<br>Compost) Without<br>RDF |
| 3    | Anuppur          | 802421      | Amarkantak    | Waste<br>Compost |    | Pit-Based / Vermi                           |
| 4    | Anuppur          | 802419      | Anuppur (M)   | Waste<br>Compost |    | Aerobic (Windrow<br>Compost) Without<br>RDF |

|    |          |        |                        |                     |                                             |
|----|----------|--------|------------------------|---------------------|---------------------------------------------|
| 5  | Anuppur  | 900691 | Bangawan<br>(Rajnagar) | Waste To<br>Compost | Pit-Based / Vermi                           |
| 6  | Anuppur  | 802416 | Bijuri (M)             | Waste To<br>Compost | Aerobic (Windrow<br>Compost) With RDF       |
| 7  | Anuppur  | 900692 | Dola                   | Waste To<br>Compost | Pit-Based / Vermi                           |
| 8  | Anuppur  | 900693 | Dumarkachar            | Waste To<br>Compost | Pit-Based / Vermi                           |
| 9  | Anuppur  | 802420 | Jaithari               | Waste To<br>Compost | Aerobic (Windrow<br>Compost) Without<br>RDF |
| 10 | Anuppur  | 802417 | Kotma                  | Waste To<br>Compost | Aerobic (Windrow<br>Compost) Without<br>RDF |
| 11 | Anuppur  | 802418 | Pasan (M)              | Waste To<br>Compost | Aerobic (Windrow<br>Compost) With RDF       |
| 12 |          | 900156 | Shadhora               | Waste To<br>Compost | Pit-Based / Vermi                           |
| 13 | Balaghat | 802398 | Baihar (NP)            | Waste To<br>Compost | Pit-Based / Vermi                           |
| 14 |          | 802397 | Balaghat (M)           | Waste To<br>Compost | Pit-Based / Vermi                           |
| 15 | Barwani  | 802286 | Anjad (NP)             | Waste To<br>Compost | Aerobic (Windrow<br>Compost) With RDF       |
| 16 |          | 802285 | Badwani                | Waste To<br>Compost | Pit-Based / Vermi                           |
| 17 |          | 900677 | Niwali Burjurg         | Waste To<br>Compost | Aerobic (Windrow<br>Compost) With RDF       |
| 18 |          | 802289 | Pansemal (NP)          | Waste To<br>Compost | Aerobic (Windrow<br>Compost) Without<br>RDF |
| 19 |          | 802287 | Rajpur (M)             | Waste To<br>Compost | Pit-Based / Vermi                           |

|    |            |        |                        |                                                              |
|----|------------|--------|------------------------|--------------------------------------------------------------|
| 20 |            | 802291 | Sendhwa (M)            | Waste To Aerobic (Windrow<br>Compost Compost) Without<br>RDF |
| 21 |            | 900678 | Thikari                | Waste To Aerobic (Windrow<br>Compost Compost) With RDF       |
| 22 | Betul      | 802340 | Amla                   | Waste To Pit-Based / Vermi<br>Compost                        |
| 23 |            | 802334 | Athner (NP)            | Waste To Pit-Based / Vermi<br>Compost                        |
| 24 |            | 802335 | Betul (M)              | Waste To Aerobic (Windrow<br>Compost Compost)                |
| 25 | Betul      | 802336 | Betul-Bazar (NP)       | Waste To Pit-Based / Vermi<br>Compost                        |
| 26 |            | 802333 | Bhainsdehi (NP)        | Waste To Pit-Based / Vermi<br>Compost                        |
| 27 |            | 802339 | Multai (M)             | Waste To Pit-Based / Vermi<br>Compost                        |
| 28 |            | 900703 | Shahpur                | Waste To Pit-Based / Vermi<br>Compost                        |
| 29 | Bhopal     | 802311 | Berasia                | Waste To Pit-Based / Vermi<br>Compost                        |
| 30 |            | 802312 | Bhopal (M Corp.)       | Waste To Aerobic (Windrow<br>Compost Compost) Without<br>RDF |
| 31 |            | 802312 | Bhopal (M Corp.)       | Waste To Anaerobic Without<br>Compost RDF                    |
| 32 | Burhanpur  | 802439 | Burhanpur (M<br>Corp.) | Waste To Aerobic (Windrow<br>Compost Compost) Without<br>RDF |
| 33 |            | 802441 | Nepanagar              | Waste To Pit-Based / Vermi<br>Compost                        |
| 34 | Chhindwara | 802377 | Amarwara (M)           | Waste To Pit-Based / Vermi<br>Compost                        |

|    |       |        |                 |                                                   |
|----|-------|--------|-----------------|---------------------------------------------------|
| 35 |       | 802380 | Jamai (M)       | Waste To Pit-Based / Vermi Compost                |
| 36 | Damoh | 802167 | Damoh           | Waste To Pit-Based / Vermi Compost                |
| 37 |       | 802168 | Tendukheda (NP) | Waste To Pit-Based / Vermi Compost                |
| 38 | Dewas | 802254 | Bagli (NP)      | Waste To Pit-Based / Vermi Compost                |
| 39 |       | 802248 | Dewas (M Corp.) | Waste To Aerobic ...<br>(incomplete in your text) |
| 40 | Dewas | 802248 | Dewas (M Corp.) | Waste To Aerobic (Windrow Compost) Without RDF    |
| 41 |       | 802249 | Kannod (NP)     | Waste To Aerobic (Windrow Compost) With RDF       |
| 42 |       | 802251 | Kantaphod (NP)  | Waste To Pit-Based / Vermi Compost                |
| 43 |       | 802253 | Karnawad        | Waste To Pit-Based / Vermi Compost                |
| 44 |       | 802256 | Khategaon (NP)  | Waste To Pit-Based / Vermi Compost                |
| 45 |       | 802244 | Tonk Khurd (NP) | Waste To Pit-Based / Vermi Compost                |
| 46 | Dhar  | 802257 | Badnawar (NP)   | Waste To Pit-Based / Vermi Compost                |
| 47 |       | 802264 | Dahi (NP)       | Waste To Aerobic (Windrow Compost) Without RDF    |
| 48 |       | 802266 | Dhamnod (NP)    | Waste To Pit-Based / Vermi Compost                |
| 49 |       | 802260 | Dhar (M)        | Waste To Pit-Based / Vermi Compost                |

|    |             |        |                 |                                                |
|----|-------------|--------|-----------------|------------------------------------------------|
| 50 |             | 802267 | Dharampuri (NP) | Waste To Pit-Based / Vermi Compost             |
| 51 |             | 802263 | Kukshi (NP)     | Waste To Aerobic (Windrow Compost) With RDF    |
| 52 |             | 802265 | Manawar (M)     | Waste To Pit-Based / Vermi Compost             |
| 53 |             | 802262 | Mandav (NP)     | Waste To Pit-Based / Vermi Compost             |
| 54 |             | 802261 | Pithampur (M)   | Waste To Aerobic (Windrow Compost) Without RDF |
| 55 |             | 802258 | Rajgarh (NP)    | Waste To Pit-Based / Vermi Compost             |
| 56 |             | 802259 | Sardarpur       | Waste To Aerobic (Windrow Compost) Without RDF |
| 57 | Dindori     | 802371 | Dindori (NP)    | Waste To Pit-Based / Vermi Compost             |
| 58 | -           | 802370 | Shahpura (NP)   | Waste To Pit-Based / Vermi Compost             |
| 59 | Harda       | 802342 | Harda (M)       | Waste To Aerobic (Windrow Compost) Without RDF |
| 60 | Harda       | 802341 | Khirkiya        | Waste To - Compost                             |
| 61 | Harda       | 900704 | Sirali          | Waste To Pit-Based / Vermi Compost             |
| 62 | Harda       | 802343 | Timarni (NP)    | Waste To Pit-Based / Vermi Compost             |
| 63 | Hoshangabad | 802347 | Babai (NP)      | Waste To Pit-Based / Vermi Compost             |
| 64 | Hoshangabad | 802346 | Hoshangabad (M) | Waste To Pit-Based / Vermi Compost             |

|    |             |        |                 |                                                |
|----|-------------|--------|-----------------|------------------------------------------------|
| 65 | Hoshangabad | 802345 | Itarsi (M)      | Waste To Pit-Based / Vermi Compost             |
| 66 | Hoshangabad | 802350 | Pachmarhi Cantt | Waste To Aerobic (Windrow Compost) Without RDF |
| 67 | Hoshangabad | 802349 | Pipariya (M)    | Waste To Pit-Based / Vermi Compost             |
| 68 | Hoshangabad | 802344 | Seoni-Malwa (M) | Waste To Anaerobic Without RDF                 |
| 69 | Hoshangabad | 802348 | Sohagpur (NP)   | Waste To Pit-Based / Vermi Compost             |
| 70 | Hoshangabad | 900171 | Vankhedi        | Waste To Aerobic (Windrow Compost) Without RDF |
| 71 | Indore      | 802270 | Betma           | Waste To Pit-Based / Vermi Compost             |
| 72 | Indore      | 802269 | Depalpur (NP)   | Waste To Pit-Based / Vermi Compost             |
| 73 | Indore      | 802271 | Hatod (NP)      | Waste To Pit-Based / Vermi Compost             |
| 74 | Indore      | 802273 | Indore          | Waste To Aerobic (Windrow Compost) Without RDF |
| 75 | Indore      | 802273 | Indore          | Waste To Aerobic (Windrow Compost) Without RDF |
| 76 | Indore      | 802273 | Indore          | Waste To Aerobic (Windrow Compost) Without RDF |
| 77 | Indore      | 802273 | Indore          | Waste To Aerobic (Windrow Compost) Without RDF |



|    |        |        |                          |                                                              |
|----|--------|--------|--------------------------|--------------------------------------------------------------|
| 78 | Indore | 802273 | Indore                   | Waste To Aerobic (Windrow<br>Compost Compost) Without<br>RDF |
| 79 | Indore | 802273 | Indore                   | Waste To Aerobic (Windrow<br>Compost Compost) Without<br>RDF |
| 80 | Indore | 802273 | Indore                   | Waste To Aerobic (Windrow<br>Compost Compost) Without<br>RDF |
| 81 | Indore | 802273 | Indore                   | Waste To Aerobic (Windrow<br>Compost Compost) Without<br>RDF |
| 82 | Indore | 802273 | Indore                   | Waste To Aerobic (Windrow<br>Compost Compost) Without<br>RDF |
| 83 | Indore | 802273 | Indore                   | Waste To Aerobic (Windrow<br>Compost Compost) Without<br>RDF |
| 84 | Indore | 802273 | Indore                   | Waste To Aerobic (Windrow<br>Compost Compost) Without<br>RDF |
| 85 | Indore | 802275 | Mhow Cantt               | Waste To Aerobic (Windrow<br>Compost Compost) Without<br>RDF |
| 86 | Indore | 802276 | Mhowgaon (NP)            | Waste To Pit-Based / Vermi<br>Compost                        |
| 87 | Indore | 802274 | Rau (NP)                 | Waste To Pit-Based / Vermi<br>Compost                        |
| 88 | Indore | 802268 | Runji-Gautampura<br>(NP) | Waste To Pit-Based / Vermi<br>Compost                        |
| 89 | Indore | 802272 | Sanwer                   | Waste To Pit-Based / Vermi<br>Compost                        |

|     |          |        |                   |                                                              |
|-----|----------|--------|-------------------|--------------------------------------------------------------|
| 90  | Jabalpur | 802363 | Barela (NP)       | Waste To Pit-Based / Vermi<br>Compost                        |
| 91  | Jabalpur | 802362 | Bhedaghat         | Waste To Aerobic (Windrow<br>Compost Compost) Without<br>RDF |
| 92  | Jabalpur | 802360 | Jabalpur Cantt    | Waste To Aerobic (Windrow<br>Compost Compost) Without<br>RDF |
| 93  | Jabalpur | 802357 | Katangi (NP)      | Waste To Pit-Based / Vermi<br>Compost                        |
| 94  | Jabalpur | 802356 | Manjholi_J        | Waste To Pit-Based / Vermi<br>Compost                        |
| 95  | Jabalpur | 802364 | Panagar           | Waste To Pit-Based / Vermi<br>Compost                        |
| 96  | Jabalpur | 802358 | Patan_MP          | Waste To Pit-Based / Vermi<br>Compost                        |
| 97  | Jabalpur | 802359 | Shahpur Bhitoni   | Waste To Pit-Based / Vermi<br>Compost                        |
| 98  | Jhabua   | 802429 | Jhabua (M)        | Waste To Pit-Based / Vermi<br>Compost                        |
| 99  | Jhabua   | 900157 | Meghnagar         | Waste To Pit-Based / Vermi<br>Compost                        |
| 100 | Jhabua   | 802428 | Petlawad (NP)     | Waste To Pit-Based / Vermi<br>Compost                        |
| 101 | Jhabua   | 802430 | Ranapur           | Waste To Pit-Based / Vermi<br>Compost                        |
| 102 | Jhabua   | 802427 | Thandla (NP)      | Waste To Pit-Based / Vermi<br>Compost                        |
| 103 | Khandwa  | 802434 | Chhanera (NP)     | Waste To Pit-Based / Vermi<br>Compost                        |
| 104 | Khandwa  | 802435 | Khandwa (M Corp.) | Waste To Aerobic (Windrow<br>Compost Compost) Without<br>RDF |

|     |          |        |                      |                                                |
|-----|----------|--------|----------------------|------------------------------------------------|
| 105 | Khandwa  | 802437 | Mundi (NP)           | Waste To Pit-Based / Vermi Compost             |
| 106 | Khandwa  | 802436 | Omkareshwar (NP)     | Waste To Pit-Based / Vermi Compost             |
| 107 | Khandwa  | 802438 | Pandhana (NP)        | Waste To Pit-Based / Vermi Compost             |
| 108 | Khargone | 802278 | Barwaha (M)          | Waste To Pit-Based / Vermi Compost             |
| 109 | Khargone | 802283 | Bhikangaon (NP)      | Waste To Pit-Based / Vermi Compost             |
| 110 | Khargone | 900679 | Bistaan              | Waste To Pit-Based / Vermi Compost             |
| 111 | Khargone | 900158 | Karahi Padliya Khurd | Waste To Pit-Based / Vermi Compost             |
| 112 | Khargone | 802282 | Kasrawad             | Waste To Pit-Based / Vermi Compost             |
| 113 | Khargone | 802284 | Khargone (M)         | Waste To Aerobic (Windrow Compost) Without RDF |
| 114 | Khargone | 802280 | Maheshwar (NP)       | Waste To Pit-Based / Vermi Compost             |
| 115 | Khargone | 802281 | Mandleshwar          | Waste To Pit-Based / Vermi Compost             |
| 116 | Khargone | 802279 | Sanawad (M)          | Waste To Pit-Based / Vermi Compost             |
| 117 | Mandla   | 802374 | Bamhani (NP)         | Waste To Pit-Based / Vermi Compost             |
| 118 | Mandla   | 802375 | Bhua Bhicchhia       | Waste To Pit-Based / Vermi Compost             |
| 119 | Mandla   | 802373 | Mandla               | Waste To Pit-Based / Vermi Compost             |
| 120 | Mandla   | 802376 | Nainpur              | Waste To Aerobic (Windrow Compost) With RDF    |

|     |                 |        |                         |                                                |
|-----|-----------------|--------|-------------------------|------------------------------------------------|
| 121 | Mandla          | 802372 | Niwas                   | Waste To Pit-Based / Vermi Compost             |
| 122 | Murwara (Katni) | 802351 | Katni                   | Waste To Aerobic (Windrow Compost) With RDF    |
| 123 | Narsimhapur     | 900163 | Chichli                 | Waste To Pit-Based / Vermi Compost             |
| 124 | Narsimhapur     | 802366 | Gadarwara (M)           | Waste To Pit-Based / Vermi Compost             |
| 125 | Narsimhapur     | 802365 | Gotegaon (NP)           | Waste To Aerobic (Windrow Compost) Without RDF |
| 126 | Narsimhapur     | 802368 | Kareli (M)              | Waste To Pit-Based / Vermi Compost             |
| 127 | Narsimhapur     | 802367 | Narsinghpur             | Waste To Pit-Based / Vermi Compost             |
| 128 | Narsimhapur     | 900159 | Sainkheda               | Waste To Pit-Based / Vermi Compost             |
| 129 | Narsimhapur     | 900162 | Salichouka (Bawaikalan) | Waste To Aerobic (Windrow Compost) Without RDF |
| 130 | Narsimhapur     | 802369 | Tendukheda (NP)         | Waste To Pit-Based / Vermi Compost             |
| 131 | Raisen          | 802330 | Baadi                   | Waste To Pit-Based / Vermi Compost             |
| 132 | Raisen          | 802329 | Bareli                  | Waste To Pit-Based / Vermi Compost             |
| 133 | Raisen          | 802325 | Begamganj (M)           | Waste To Pit-Based / Vermi Compost             |
| 134 | Raisen          | 802324 | Gairatganj (NP)         | Waste To Pit-Based / Vermi Compost             |
| 135 | Raisen          | 802327 | Mandideep               | Waste To Pit-Based / Vermi Compost             |

|     |        |        |                   |                                        |
|-----|--------|--------|-------------------|----------------------------------------|
| 136 | Raisen | 802328 | Obedullaganj (NP) | Waste To Pit-Based / Vermi<br>Compost  |
| 137 | Raisen | 802323 | Raisen (M)        | Waste To Pit-Based / Vermi<br>Compost  |
| 138 | Raisen | 802322 | Sanchi (NP)       | Waste To Pit-Based / Vermi<br>Compost  |
| 139 | Raisen | 802331 | Silwani           | Waste To Pit-Based / Vermi<br>Compost  |
| 140 | Raisen | 802326 | Sultanpur_R       | Waste To Pit-Based / Vermi<br>Compost  |
| 141 | Raisen | 802332 | Udaipura          | Waste To Pit-Based / Vermi<br>Compost  |
| 142 | Sagar  | 802159 | Sagar (M Corp.)   | Waste To Anaerobic With<br>Compost RDF |
| 143 | Sagar  | 802160 | Sagar Cantt (CB)  | Waste To Pit-Based / Vermi<br>Compost  |
| 144 | Sehore | 802315 | Ashta (M)         | Waste To Pit-Based / Vermi<br>Compost  |
| 145 | Sehore | 802320 | Budni (NP)        | Waste To Pit-Based / Vermi<br>Compost  |
| 146 | Sehore | 802318 | ICHHAWAR          | Waste To Pit-Based / Vermi<br>Compost  |
| 147 | Sehore | 802317 | Jawar (NP)        | Waste To Pit-Based / Vermi<br>Compost  |
| 148 | Sehore | 802316 | Kothri (NP)       | Waste To Pit-Based / Vermi<br>Compost  |
| 149 | Sehore | 802319 | Nasrullaganj (NP) | Waste To Pit-Based / Vermi<br>Compost  |
| 150 | Sehore | 802321 | Rehti (NP)        | Waste To Pit-Based / Vermi<br>Compost  |
| 151 | Sehore | 802314 | Sehore (M)        | Waste To Pit-Based / Vermi<br>Compost  |

|     |        |        |                      |       |                     |                                                 |
|-----|--------|--------|----------------------|-------|---------------------|-------------------------------------------------|
| 152 | Sehore | 900127 | Shahganj<br>Parishad | Nagar | Waste To<br>Compost | Pit-Based / Vermi                               |
| 153 | Seoni  | 802394 | BARGHAT              |       | Waste To<br>Compost | Aerobic (Windrow<br>Compost) Without<br>RDF     |
| 154 | Seoni  | 900688 | CHAPARA              |       | Waste To<br>Compost | — (Sub Category<br>missing in data<br>provided) |
| 155 | Seoni  | 900689 | KEWLARI              |       | Waste To<br>Compost | Pit-Based / Vermi                               |
| 156 | Seoni  | 802392 | LAKHNADOAN           |       | Waste To<br>Compost | Pit-Based / Vermi                               |
| 157 | Seoni  | 802393 | Seoni (M)            |       | Waste To<br>Compost | Pit-Based / Vermi                               |

*Source: Solid Waste Management Annual Report 2022-23, Madhya Pradesh Pollution Control Board, Letter No. 2195 Dt. 29.8.2023*

**Table A - 10 List of dry waste processing facilities under the Narmada River basin ULBs**

| S.No | District<br>Name | ULB<br>Code | ULB Name      | Plant Type                                | Sub Category   |
|------|------------------|-------------|---------------|-------------------------------------------|----------------|
| 1    | Alirajpur        | 802433      | Alirajpur (M) | Material<br>Recovery<br>Facility<br>(MRF) | Semi Automated |
| 2    |                  | 802432      | Jobat (NP)    | Material<br>Recovery<br>Facility<br>(MRF) | Manual         |
| 3    | Anuppur          | 802421      | Amarkantak    | Material<br>Recovery<br>Facility<br>(MRF) | Manual         |

|    |        |                        |                                           |        |
|----|--------|------------------------|-------------------------------------------|--------|
| 4  | 802419 | Anuppur (M)            | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 5  | 900691 | Bangawan<br>(Rajnagar) | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 6  | 802416 | Bijuri (M)             | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 7  | 900692 | Dola                   | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 8  | 900693 | Dumarkachar            | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 9  | 802420 | Jaithari               | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 10 | 802417 | Kotma (M)              | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 11 | 802418 | Pasan (M)              | Material<br>Recovery<br>Facility<br>(MRF) | Manual |

|    |          |        |                |                                  |                |
|----|----------|--------|----------------|----------------------------------|----------------|
| 12 | Balaghat | 802398 | Baihar (NP)    | Material Recovery Facility (MRF) | Manual         |
| 13 |          | 802397 | Balaghat (M)   | Material Recovery Facility (MRF) | Semi Automated |
| 14 | Barwani  | 802286 | Anjad (NP)     | Material Recovery Facility (MRF) | Manual         |
| 15 |          | 802285 | Barwani (M)    | Material Recovery Facility (MRF) | Semi Automated |
| 16 |          | 900677 | Niwali Burjurg | Material Recovery Facility (MRF) | Manual         |
| 17 |          | 802288 | Palsud (NP)    | Material Recovery Facility (MRF) | Manual         |
| 18 |          | 802289 | Pansemal (NP)  | Material Recovery Facility (MRF) | Manual         |
| 19 |          | 802287 | Rajpur (NP)    | Material Recovery Facility (MRF) | Manual         |



|    |        |        |                  |                                           |        |
|----|--------|--------|------------------|-------------------------------------------|--------|
| 20 |        | 802291 | Sendhwa (M)      | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 21 | Betul  | 802340 | Amla             | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 22 |        | 802335 | Betul (M)        | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 23 |        | 802336 | Betul-Bazar (NP) | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 24 |        | 802333 | Bhainsdehi (NP)  | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 25 |        | 802339 | Multai (M)       | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 26 |        | 900703 | Shahpur          | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 27 | Bhopal | 802311 | Berasia (M)      | Material<br>Recovery<br>Facility<br>(MRF) | Manual |

|    |           |        |                     |                                  |                |
|----|-----------|--------|---------------------|----------------------------------|----------------|
| 28 |           | 802312 | Bhopal (M Corp.)    | Material Recovery Facility (MRF) | Semi Automated |
| 29 |           | 802312 | Bhopal (M Corp.)    | Material Recovery Facility (MRF) | Semi Automated |
| 30 |           | 802312 | Bhopal (M Corp.)    | Material Recovery Facility (MRF) | Semi Automated |
| 31 |           | 802312 | Bhopal (M Corp.)    | Material Recovery Facility (MRF) | Semi Automated |
| 32 |           | 802312 | Bhopal (M Corp.)    | Material Recovery Facility (MRF) | Semi Automated |
| 33 |           | 802312 | Bhopal (M Corp.)    | Material Recovery Facility (MRF) | Semi Automated |
| 34 | Burhanpur | 802439 | Burhanpur (M Corp.) | Material Recovery Facility (MRF) | Semi Automated |
| 35 |           | 802441 | Nepanagar (M)       | Material Recovery Facility (MRF) | Manual         |

|    |            |        |                  |                                  |                |
|----|------------|--------|------------------|----------------------------------|----------------|
| 36 |            | 802440 | Shahpur (NP)     | Material Recovery Facility (MRF) | Manual         |
| 37 | Chhindwara | 802377 | Amarwara (M)     | Material Recovery Facility (MRF) | Manual         |
| 38 |            | 802379 | Chaurai Khas (M) | Material Recovery Facility (MRF) | Manual         |
| 39 |            | 802386 | Chhindwara       | Material Recovery Facility (MRF) | Semi Automated |
| 40 |            | 802380 | Junnardeo        | Material Recovery Facility (MRF) | Semi Automated |
| 41 | Damoh      | 802167 | Damoh (M)        | Material Recovery Facility (MRF) | Manual         |
| 42 |            | 802164 | Hatta (M)        | Material Recovery Facility (MRF) | Manual         |
| 43 |            | 802166 | Hindoriya        | Material Recovery Facility (MRF) | Manual         |

|    |       |        |                 |                                  |                |
|----|-------|--------|-----------------|----------------------------------|----------------|
| 44 |       | 900165 | Patera          | Material Recovery Facility (MRF) | Manual         |
| 45 |       | 802165 | Pathariya       | Material Recovery Facility (MRF) | Manual         |
| 46 |       | 802168 | Tendukheda (NP) | Material Recovery Facility (MRF) | Manual         |
| 47 | Dewas | 802254 | Bagli (NP)      | Material Recovery Facility (MRF) | Manual         |
| 48 |       | 802245 | Bhaurasa (NP)   | Material Recovery Facility (MRF) | Manual         |
| 49 |       | 802248 | Dewas (M Corp.) | Material Recovery Facility (MRF) | Semi Automated |
| 50 |       | 802255 | Hatpipliya      | Material Recovery Facility (MRF) | Manual         |
| 51 |       | 802249 | Kannod (NP)     | Material Recovery Facility (MRF) | Manual         |

|    |        |                 |                                           |        |
|----|--------|-----------------|-------------------------------------------|--------|
| 52 | 802251 | Kantaphod (NP)  | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 53 | 802253 | Karnawad        | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 54 | 802256 | Khategaon       | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 55 | 802256 | Khategaon (NP)  | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 56 | 802250 | Loharda (NP)    | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 57 | 900166 | Nemawar         | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 58 | 802247 | Pipalrawan (NP) | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 59 | 802252 | Satwas (NP)     | Material<br>Recovery<br>Facility<br>(MRF) | Manual |

|    |      |        |                 |                                           |                |
|----|------|--------|-----------------|-------------------------------------------|----------------|
| 60 |      | 802246 | Sonkatch (NP)   | Material<br>Recovery<br>Facility<br>(MRF) | Manual         |
| 61 |      | 802244 | Tonk Khurd (NP) | Material<br>Recovery<br>Facility<br>(MRF) | Manual         |
| 62 | Dhar | 802257 | Badnawar (NP)   | Material<br>Recovery<br>Facility<br>(MRF) | Semi Automated |
| 63 |      | 802264 | Dahi (NP)       | Material<br>Recovery<br>Facility<br>(MRF) | Manual         |
| 64 |      | 802266 | Dhamnood (NP)   | Material<br>Recovery<br>Facility<br>(MRF) | Manual         |
| 65 |      | 802260 | Dhar (M)        | Material<br>Recovery<br>Facility<br>(MRF) | Semi Automated |
| 66 | Dhar | 802263 | Kukshi (NP)     | Material<br>Recovery<br>Facility<br>(MRF) | Semi Automated |
| 67 | Dhar | 802265 | Manawar (M)     | Material<br>Recovery<br>Facility<br>(MRF) | Manual         |

|    |         |        |                |                                  |                 |
|----|---------|--------|----------------|----------------------------------|-----------------|
| 68 | Dhar    | 802262 | Mandav (NP)    | Material Recovery Facility (MRF) | Manual          |
| 69 | Dhar    | 802261 | Pithampur (M)  | Material Recovery Facility (MRF) | Semi Automated  |
| 70 | Dhar    | 802258 | Rajgarh (NP)   | Material Recovery Facility (MRF) | Manual          |
| 71 | Dhar    | 802259 | Sardarpur (NP) | Material Recovery Facility (MRF) | Fully Automated |
| 72 | Dindori | 802371 | Dindori (NP)   | Material Recovery Facility (MRF) | Manual          |
| 73 | Dindori | 802370 | SHAHPURA_D     | Material Recovery Facility (MRF) | Manual          |
| 74 | Harda   | 802341 | KHIRKIYA       | Material Recovery Facility (MRF) | Manual          |
| 75 | Harda   | 900704 | SIRALI         | Material Recovery Facility (MRF) | Manual          |

|    |             |        |                 |                                  |                |
|----|-------------|--------|-----------------|----------------------------------|----------------|
| 76 | Harda       | 802343 | Timarni (NP)    | Material Recovery Facility (MRF) | Manual         |
| 77 | Hoshangabad | 802347 | Babai (NP)      | Material Recovery Facility (MRF) | Manual         |
| 78 | Hoshangabad | 802346 | Hoshangabad (M) | Material Recovery Facility (MRF) | Semi Automated |
| 79 | Hoshangabad | 802345 | Itarsi (M)      | Material Recovery Facility (MRF) | Manual         |
| 80 | Hoshangabad | 802350 | PACHMARHI CANTT | Material Recovery Facility (MRF) | Manual         |
| 81 | Hoshangabad | 802349 | Pipariya (M)    | Material Recovery Facility (MRF) | Manual         |
| 82 | Hoshangabad | 802344 | SEONI MALWA     | Material Recovery Facility (MRF) | Manual         |
| 83 | Hoshangabad | 802348 | Sohagpur (NP)   | Material Recovery Facility (MRF) | Manual         |



|    |             |        |               |                                  |                |
|----|-------------|--------|---------------|----------------------------------|----------------|
| 84 | Hoshangabad | 900171 | Vankhedi      | Material Recovery Facility (MRF) | Manual         |
| 85 | Indore      | 802270 | BETMA         | Material Recovery Facility (MRF) | Manual         |
| 86 | Indore      | 802269 | Depalpur (NP) | Material Recovery Facility (MRF) | Manual         |
| 87 | Indore      | 802271 | Hatod (NP)    | Material Recovery Facility (MRF) | Manual         |
| 88 | Indore      | 802273 | INDORE        | Material Recovery Facility (MRF) | Manual         |
| 89 | Indore      | 802273 | INDORE        | Material Recovery Facility (MRF) | Manual         |
| 90 | Indore      | 802273 | INDORE        | Material Recovery Facility (MRF) | Manual         |
| 91 | Indore      | 802273 | INDORE        | Material Recovery Facility (MRF) | Semi Automated |

|    |        |        |                       |                                  |                 |
|----|--------|--------|-----------------------|----------------------------------|-----------------|
| 92 | Indore | 802273 | INDORE                | Material Recovery Facility (MRF) | Fully Automated |
| 93 | Indore | 802273 | INDORE                | Material Recovery Facility (MRF) | Manual          |
| 94 | Indore | 802277 | Manpur (NP)           | Material Recovery Facility (MRF) | Manual          |
| 95 | Indore | 802275 | Mhow Cantt (CB)       | Material Recovery Facility (MRF) | Manual          |
| 96 | Indore | 802276 | Mhowgaon (NP)         | Material Recovery Facility (MRF) | Manual          |
| 97 | Indore | 802274 | Rau (NP)              | Material Recovery Facility (MRF) | Manual          |
| 98 | Indore | 802268 | Runji-Gautampura (NP) | Material Recovery Facility (MRF) | Manual          |
| 99 | Indore | 802272 | SANWER                | Material Recovery Facility (MRF) | Manual          |

|     |          |        |                   |                                           |        |
|-----|----------|--------|-------------------|-------------------------------------------|--------|
| 100 | Shahdol  | 900694 | Bakho             | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 101 | Jabalpur | 802363 | Barela (NP)       | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 102 | Jabalpur | 802363 | BERALA_M          | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 103 | Jabalpur | 802362 | BHEDAGHAT         | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 104 | Jabalpur | 802360 | JABALPUR<br>CANTT | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 105 | Jabalpur | 802357 | Katangi (NP)      | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 106 | Jabalpur | 802356 | MANJHOLI_J        | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 107 | Jabalpur | 802364 | PANAGAR           | Material<br>Recovery<br>Facility<br>(MRF) | Manual |

|     |          |        |                 |                                  |                 |
|-----|----------|--------|-----------------|----------------------------------|-----------------|
| 108 | Jabalpur | 802358 | PATAN_MP        | Material Recovery Facility (MRF) | Manual          |
| 109 | Jabalpur | 802359 | SHAHPUR BHITONI | Material Recovery Facility (MRF) | Manual          |
| 110 | Jhabua   | 802429 | Jhabua (M)      | Material Recovery Facility (MRF) | Manual          |
| 111 | Jhabua   | 900157 | MEGHNAGAR       | Material Recovery Facility (MRF) | Fully Automated |
| 112 | Jhabua   | 802428 | Petlawad (NP)   | Material Recovery Facility (MRF) | Manual          |
| 113 | Jhabua   | 802430 | RANAPUR         | Material Recovery Facility (MRF) | Manual          |
| 114 | Jhabua   | 802427 | Thandla (NP)    | Material Recovery Facility (MRF) | Manual          |
| 115 | Khandwa  | 802434 | Chhanera (NP)   | Material Recovery Facility (MRF) | Manual          |

|     |          |        |                     |                                  |                 |
|-----|----------|--------|---------------------|----------------------------------|-----------------|
| 116 | Khandwa  | 802435 | Khandwa (M Corp.)   | Material Recovery Facility (MRF) | Semi Automated  |
| 117 | Khandwa  | 802437 | Mundi (NP)          | Material Recovery Facility (MRF) | Fully Automated |
| 118 | Khandwa  | 802436 | Omkareshwar (NP)    | Material Recovery Facility (MRF) | Manual          |
| 119 | Khandwa  | 802438 | PANDHANA            | Material Recovery Facility (MRF) | Manual          |
| 120 | Khargaon | 802278 | Barwaha (M)         | Material Recovery Facility (MRF) | Manual          |
| 121 | Khargaon | 802283 | Bhikangaon (NP)     | Material Recovery Facility (MRF) | Manual          |
| 122 | Khargaon | 900679 | BISTAAN             | Material Recovery Facility (MRF) | Semi Automated  |
| 123 | Khargaon | 900158 | KARAH PADLIYA KHURD | Material Recovery Facility (MRF) | Manual          |

|     |          |        |                |                                  |                |
|-----|----------|--------|----------------|----------------------------------|----------------|
| 124 | Khargaon | 802282 | KASRAWAD       | Material Recovery Facility (MRF) | Manual         |
| 125 | Khargaon | 802284 | KHARGONE       | Material Recovery Facility (MRF) | Semi Automated |
| 126 | Khargaon | 802280 | Maheshwar (NP) | Material Recovery Facility (MRF) | Manual         |
| 127 | Khargaon | 802281 | MANDLESHWAR    | Material Recovery Facility (MRF) | Manual         |
| 128 | Khargaon | 802279 | SANAWAD        | Material Recovery Facility (MRF) | Semi Automated |
| 129 | Mandla   | 802374 | Bamhani (NP)   | Material Recovery Facility (MRF) | Manual         |
| 130 | Mandla   | 802375 | BHUA BHICHHIA  | Material Recovery Facility (MRF) | Manual         |
| 131 | Mandla   | 802373 | Mandla (M)     | Material Recovery Facility (MRF) | Manual         |

|     |                 |        |               |                                  |                |
|-----|-----------------|--------|---------------|----------------------------------|----------------|
| 132 | Mandla          | 802376 | Nainpur (M)   | Material Recovery Facility (MRF) | Manual         |
| 133 | Mandla          | 802372 | NIWAS         | Material Recovery Facility (MRF) | Manual         |
| 134 | Murwara (Katni) | 802351 | KATNI         | Material Recovery Facility (MRF) | Semi Automated |
| 135 | Narsimhapur     | 900163 | CHICHLI       | Material Recovery Facility (MRF) | Manual         |
| 136 | Narsimhapur     | 802366 | Gadarwara (M) | Material Recovery Facility (MRF) | Semi Automated |
| 137 | Narsimhapur     | 802365 | Gotegaon (NP) | Material Recovery Facility (MRF) | Manual         |
| 138 | Narsimhapur     | 802368 | Kareli (M)    | Material Recovery Facility (MRF) | Manual         |
| 139 | Narsimhapur     | 802367 | NARSINGHPUR   | Material Recovery Facility (MRF) | Semi Automated |

|     |             |        |                            |                                           |        |
|-----|-------------|--------|----------------------------|-------------------------------------------|--------|
| 140 | Narsimhapur | 900159 | SAINKHEDA                  | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 141 | Narsimhapur | 900162 | Salichouka<br>(Bawaikalan) | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 142 | Narsimhapur | 802369 | Tendukheda (NP)            | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 143 | Raisen      | 802330 | BAADI                      | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 144 | Raisen      | 802329 | Baraily (NP)               | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 145 | Raisen      | 802325 | Begamganj (M)              | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 146 | Raisen      | 802324 | Gairatganj (NP)            | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 147 | Raisen      | 802327 | MANDIDEEP                  | Material<br>Recovery<br>Facility<br>(MRF) | Manual |



|     |        |        |                   |                                           |        |
|-----|--------|--------|-------------------|-------------------------------------------|--------|
| 148 | Raisen | 802328 | Obedullaganj (NP) | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 149 | Raisen | 802323 | Raisen (M)        | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 150 | Raisen | 802322 | Sanchi (NP)       | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 151 | Raisen | 802331 | SILWANI           | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 152 | Raisen | 802326 | Sultanpur (NP)    | Material<br>Recovery<br>Facility<br>(MRF) | Manual |
| 153 | Raisen | 802332 | UDAIPURA          | Material<br>Recovery<br>Facility (MRF)    | Manual |

*Source: Solid Waste Management Annual Report 2022-23, Madhya Pradesh Pollution Control Board, Letter No. 2195 Dt. 29.8.2023*

*Table A - 11 District-wise Status of Hazardous Waste Management in Narmada Basin, Madhya Pradesh*

| Hazardous Waste Management |                             |                               |                   |                                    |                                                                                                                       |                                                                                                                                                                                                 |
|----------------------------|-----------------------------|-------------------------------|-------------------|------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S.No.                      | Districts                   | Block (ULB)                   | Collection center | Location of treatment and Disposal | Gaps and Challenges                                                                                                   | References                                                                                                                                                                                      |
| 1                          | Alirajpur                   | Alirajpur<br>Bhavara<br>Jobat | yes Available     | TSDf facility Dhar district.       | Required skills training for the personnel working in the sites                                                       | <a href="https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Alirajpur.pdf">https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Alirajpur.pdf</a>                                                               |
| 2                          | Anuppur<br>(Whole District) | District                      | Not Available     | TSDf facility Dhar district.       | Required skills training for the personnel working in the sites                                                       | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Anuppur&amp;pdf=/proc/Tech/DEP%20Anuppur.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Anuppur&amp;pdf=/proc/Tech/DEP%20Anuppur.pdf</a>   |
| 3                          | Balaghat                    | Baihar                        | Not required      | TSDf facility Dhar district.       | 01 TSDf is proposed in the Mandla district at Industrial Area Maneri                                                  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Balaghat&amp;pdf=/proc/Tech/BALAGHAT_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Balaghat&amp;pdf=/proc/Tech/BALAGHAT_2023.pdf</a> |
| 4                          | Barwani                     | Barwani<br>Niwali<br>Pansemal | Not Available     | TSDf facility Dhar district.       | persons working in the site with appropriate training, equipment and the information necessary to ensure their safety | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Barwani&amp;pdf=/proc/Tech/Barwani_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Barwani&amp;pdf=/proc/Tech/Barwani_2023.pdf</a>     |

|   |                               |            |                                 |                                        |                                                                        |                                                                                                                                                                                                         |
|---|-------------------------------|------------|---------------------------------|----------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                               | Rajpur     |                                 |                                        |                                                                        |                                                                                                                                                                                                         |
|   |                               | Sendhwa    |                                 |                                        |                                                                        |                                                                                                                                                                                                         |
|   |                               | Thikiri    |                                 |                                        |                                                                        |                                                                                                                                                                                                         |
|   |                               | Amla       |                                 |                                        |                                                                        |                                                                                                                                                                                                         |
|   |                               | Betul      |                                 | TSDF facility Dhar                     |                                                                        |                                                                                                                                                                                                         |
| 5 | Betul<br>(Whole District)     | Bhaisdehi  | Available                       | district.                              | No Gap identified                                                      | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Betul&amp;pdf=/proc/Tech/Betul_23.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Betul&amp;pdf=/proc/Tech/Betul_23.pdf</a>                         |
|   |                               | Multai     |                                 |                                        |                                                                        |                                                                                                                                                                                                         |
|   |                               | Shahpur    |                                 |                                        |                                                                        |                                                                                                                                                                                                         |
| 6 | Burhanpur                     | Nepanagar  | Not available                   | TSDF, Dhar district                    | No Gap identified                                                      | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Burhanpur&amp;pdf=/proc/Tech/BURHANPUR_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Burhanpur&amp;pdf=/proc/Tech/BURHANPUR_2023.pdf</a>     |
|   |                               | Amarwara   |                                 |                                        |                                                                        |                                                                                                                                                                                                         |
| 7 | Chindwara<br>(Whole District) | Junnardev  | 1 Collection center in district | TSDF, Dhar district                    | No Gap identified                                                      | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Chhindwara&amp;pdf=/proc/Tech/CHHINDWARA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Chhindwara&amp;pdf=/proc/Tech/CHHINDWARA_2023.pdf</a> |
|   |                               | Tamiya     |                                 |                                        |                                                                        |                                                                                                                                                                                                         |
| 8 | Damoh                         | Tendukheda | Not available                   | Not linked with the facilities of TSDF | ULBs are required to be linked with TSDF and Waste be sent as per rule | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Damoh&amp;pdf=/proc/Tech/Damoh_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Damoh&amp;pdf=/proc/Tech/Damoh_2023.pdf</a>                     |
|   |                               | Bagli      |                                 |                                        |                                                                        |                                                                                                                                                                                                         |
| 9 | Dewas                         | Dewas      | Yes Available                   | TSDF, Dhar district                    | No gap identified                                                      |                                                                                                                                                                                                         |

|    |                          |            |               |                     |                                                   |                                                                                                                                                                                                                               |
|----|--------------------------|------------|---------------|---------------------|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                          | Kannod     |               |                     |                                                   | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dewas&amp;pdf=/proc/Tech/DEWAS_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dewas&amp;pdf=/proc/Tech/DEWAS_2023.pdf</a>                                           |
|    |                          | Khategaon  |               |                     |                                                   |                                                                                                                                                                                                                               |
|    |                          | Dhar       |               |                     |                                                   |                                                                                                                                                                                                                               |
|    |                          | Dharamपुरi |               |                     |                                                   |                                                                                                                                                                                                                               |
| 10 | Dhar (Whole District)    | Gandhwani  | Yes Available | TSDF, Dhar district | In all ULBs collection units must be established. | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dhar&amp;pdf=/proc/Tech/DHAR_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dhar&amp;pdf=/proc/Tech/DHAR_2023.pdf</a>                                               |
|    |                          | Kukshi     |               |                     |                                                   |                                                                                                                                                                                                                               |
|    |                          | Manawar    |               |                     |                                                   |                                                                                                                                                                                                                               |
|    |                          | Sardarpur  |               |                     |                                                   |                                                                                                                                                                                                                               |
|    |                          | Dindori    |               |                     |                                                   |                                                                                                                                                                                                                               |
| 11 | Dindori (Whole District) | Shahpura   | Yes Available | TSDF, Dhar district | No Gap identified                                 | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dindori&amp;pdf=/proc/Tech/DIN DORI_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dindori&amp;pdf=/proc/Tech/DIN DORI_2023.pdf</a>                                 |
|    |                          | Harsud     |               |                     |                                                   |                                                                                                                                                                                                                               |
| 12 | Khandwa                  | Khandwa    | Not Available | TSDF, Dhar District | No Gap identified                                 | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Khandwa%20(East%20Nimar)&amp;pdf=/proc/Tech/Khandwa_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Khandwa%20(East%20Nimar)&amp;pdf=/proc/Tech/Khandwa_2023.pdf</a> |
|    |                          | Pandhana   |               |                     |                                                   |                                                                                                                                                                                                                               |
|    |                          | Harda      |               |                     |                                                   |                                                                                                                                                                                                                               |
| 13 | Harda                    | Khirkia    | yes Available | TSDF, Dhar District | No Gap identified                                 | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Harda&amp;pdf=/proc/Tech/harda_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Harda&amp;pdf=/proc/Tech/harda_2023.pdf</a>                                           |
|    |                          | Timurni    |               |                     |                                                   |                                                                                                                                                                                                                               |

|    |            |             |                                   |                     |                                                      |                                                                                                                                                                                                               |
|----|------------|-------------|-----------------------------------|---------------------|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |            | Babai       |                                   |                     |                                                      |                                                                                                                                                                                                               |
|    |            | Bankheri    |                                   |                     |                                                      |                                                                                                                                                                                                               |
|    |            | Hoshangabad |                                   |                     |                                                      |                                                                                                                                                                                                               |
| 14 | Hosangabad | Itarsi      | No Collection<br>Center available | TSDF, Dhar District | Collection centers are<br>required to be established | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Hoshangabad&amp;pdf=/proc/Tech/Narmadapuram_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Hoshangabad&amp;pdf=/proc/Tech/Narmadapuram_2023.pdf</a> |
|    |            | Piparia     |                                   |                     |                                                      |                                                                                                                                                                                                               |
|    |            | Seonimalwa  |                                   |                     |                                                      |                                                                                                                                                                                                               |
|    |            | Sohagpur    |                                   |                     |                                                      |                                                                                                                                                                                                               |
| 15 | Indore     | Mhow        | Not Available                     | TSDF, Dhar District | Not Available                                        | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Indore&amp;pdf=/proc/Tech/INDORE_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Indore&amp;pdf=/proc/Tech/INDORE_2023.pdf</a>                       |
|    |            | Jabalpur    |                                   |                     |                                                      |                                                                                                                                                                                                               |
|    |            | Kundam      |                                   |                     |                                                      |                                                                                                                                                                                                               |
| 16 | Jabalpur   | Majholi     | Yes available                     | TSDF, Dhar District | No Gap identified                                    | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jabalpur&amp;pdf=/proc/Tech/Jabalpur_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jabalpur&amp;pdf=/proc/Tech/Jabalpur_2023.pdf</a>               |
|    |            | Patan       |                                   |                     |                                                      |                                                                                                                                                                                                               |
|    |            | Shahpura    |                                   |                     |                                                      |                                                                                                                                                                                                               |
|    |            | Shihora     |                                   |                     |                                                      |                                                                                                                                                                                                               |
| 17 |            | Jhabua      | Not available                     | TSDF, Dhar District |                                                      |                                                                                                                                                                                                               |

|    |                            |                                                     |                           |                     |                                                  |                                                                                                                                                                                                             |
|----|----------------------------|-----------------------------------------------------|---------------------------|---------------------|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | Jhabua<br>(Whole District) | Ranapur                                             |                           |                     | Hazardous waste collections are required in ULBs | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jhabua&amp;pdf=/proc/Tech/JHABUA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jhabua&amp;pdf=/proc/Tech/JHABUA_2023.pdf</a>                     |
| 18 | Katni<br>(Whole District)  | Bahuriband<br>Dhimarkhera<br>Rathi<br>Bichhiya      | Not available             | TSDF, Dhar District | Collection centers are required                  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Katni&amp;pdf=/proc/Tech/KATNI_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Katni&amp;pdf=/proc/Tech/KATNI_2023.pdf</a>                         |
| 19 | Mandla                     | Mandla<br>Nainpur<br>Niwas<br>Gadarwara<br>Gotegaon | Yes available             | TSDF, Dhar District | No gap identified                                | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Mandla&amp;pdf=/proc/Tech/MANDLA.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Mandla&amp;pdf=/proc/Tech/MANDLA.pdf</a>                               |
| 20 | Narshingpur                | Kareli<br>Narshingpur<br>Tendukheda<br>Bareli       | Yes available             | TSDF, Dhar District | No gap identified                                | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Narsinghpur&amp;pdf=/proc/Tech/NARSINGHPUR_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Narsinghpur&amp;pdf=/proc/Tech/NARSINGHPUR_2023.pdf</a> |
| 21 | Raisen                     | Begamganj<br>Gairatganj<br>Goharganj                | Directly linked with TSDF | TSDF, Dhar District | No Gap identified                                | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Raisen&amp;pdf=/proc/Tech/Raisen_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Raisen&amp;pdf=/proc/Tech/Raisen_2023.pdf</a>                     |

|    |            |                  |               |                     |                                           |                                                                                                                                                                                           |
|----|------------|------------------|---------------|---------------------|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |            | Raisen           |               |                     |                                           |                                                                                                                                                                                           |
|    |            | Silvani          |               |                     |                                           |                                                                                                                                                                                           |
|    |            | Udaipura         |               |                     |                                           |                                                                                                                                                                                           |
| 22 | Sagar      | Deori            | Not required  | TSDF Dhar           | No Gap identified                         | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sagar&amp;pdf=/proc/Tech/Sagar_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sagar&amp;pdf=/proc/Tech/Sagar_2023.pdf</a>       |
|    |            | Kesli            |               |                     |                                           |                                                                                                                                                                                           |
|    |            | Ashta            |               |                     |                                           |                                                                                                                                                                                           |
|    |            | Budhni           |               |                     |                                           |                                                                                                                                                                                           |
| 23 | Sehore     | Ichawar          | Yes available | TSDF, Dhar District | No gap identified                         | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sehore&amp;pdf=/proc/Tech/SEHORE_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sehore&amp;pdf=/proc/Tech/SEHORE_2023.pdf</a>   |
|    |            | Nasrullaganj     |               |                     |                                           |                                                                                                                                                                                           |
|    |            | Sehore           |               |                     |                                           |                                                                                                                                                                                           |
|    |            | Ghansaur         |               |                     |                                           |                                                                                                                                                                                           |
| 24 | Seoni      | Lakhnadon        | Yes available | TSDF Dhar           | No Gap identified                         | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Seoni&amp;pdf=/proc/Tech/Seoni_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Seoni&amp;pdf=/proc/Tech/Seoni_2023.pdf</a>       |
|    |            | Bandhogarh       |               |                     |                                           |                                                                                                                                                                                           |
| 25 | Umaria     | (Whole District) | Not available | TSDF Dhar           | Collection centers need to be established | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Umaria&amp;pdf=/proc/Tech/UMARIYA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Umaria&amp;pdf=/proc/Tech/UMARIYA_2023.pdf</a> |
|    |            | Barwah           |               |                     |                                           |                                                                                                                                                                                           |
| 26 | West Nimar | Bhagwanpura      | Not available | TSDF, Dhar          | No Gap identified                         | <a href="https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Khargone.pdf">https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Khargone.pdf</a>                                                           |
|    |            | Bhikangaon       |               |                     |                                           |                                                                                                                                                                                           |

Jhirniya  
Kasrawas  
Khargone  
Maheshwar  
Seagon

\*Source: MPCB District environment plan

*Table A - 12 District-wise Status of Biomedical Waste Management in Narmada Basin, Madhya Pradesh*

| S.No | Districts                   | Block (ULB)                   | Biomedical Waste Management |                                     |                                                                                     | References                                                                                                                                                                                    |
|------|-----------------------------|-------------------------------|-----------------------------|-------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      |                             |                               | Treatment and disposal at   | District level monitoring Committee | Gaps and Challenges                                                                 |                                                                                                                                                                                               |
| 1    | Alirajpur                   | Alirajpur<br>Bhavara<br>Jobat | CBWTF Indore                | Yes formed                          | Inventory Updation required.<br>Awareness programs should be<br>runned time to time | <a href="https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Alirajpur.pdf">https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Alirajpur.pdf</a>                                                             |
| 2    | Anuppur<br>(Whole District) | District                      | CBWTF Umari                 | Yes Formed                          | Barcoding on biomedical waste<br>generated is to be implemented                     | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Anuppur&amp;pdf=/proc/Tech/DEP%20Anuppur.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Anuppur&amp;pdf=/proc/Tech/DEP%20Anuppur.pdf</a> |



|   |                           |                                                                       |                                                                              |            |                                                                |                                                                                                                                                                                                     |
|---|---------------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------------|------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3 | Balaghat                  | Baihar                                                                | CBMWTF Seoni                                                                 | Yes Formed | Barcoding on biomedical waste generated is to be implemented   | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Balaghat&amp;pdf=/proc/Tech/BALAGHAT_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Balaghat&amp;pdf=/proc/Tech/BALAGHAT_2023.pdf</a>     |
| 4 | Barwani                   | Barwani<br>Niwali<br>Pansemal<br>Rajpur<br>Sendhwa<br>Thikiri<br>Amla | CBWTFs Facility established in Indore Dist. M/s. Hoswin Incinerator Pvt. Ltd | Yes Formed | Regularly awareness programs is to be runned by the authority. | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Barwani&amp;pdf=/proc/Tech/Badwani_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Barwani&amp;pdf=/proc/Tech/Badwani_2023.pdf</a>         |
| 5 | Betul<br>(Whole District) | Betul<br>Bhaisdehi<br>Multai<br>Shahpur                               | CBWTF operating in Sehore                                                    | Yes formed | No Gap identified                                              | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Betul&amp;pdf=/proc/Tech/Betul_23.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Betul&amp;pdf=/proc/Tech/Betul_23.pdf</a>                     |
| 6 | Burhanpur                 | Nepanagar                                                             | CBWTF M/s. Medisure Incinerators Dist-Khandwa                                | Yes Formed | No Gap identified                                              | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Burhanpur&amp;pdf=/proc/Tech/BURHANPUR_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Burhanpur&amp;pdf=/proc/Tech/BURHANPUR_2023.pdf</a> |
| 7 |                           | Amarwara<br>Junnardev                                                 | CBWTF Seoni District                                                         | Yes Formed | No Gaps identified                                             |                                                                                                                                                                                                     |

|    |                               |                                                             |                                                              |            |                    |                                                                                                                                                                                                         |
|----|-------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | Chindwara<br>(Whole District) | Tamiya                                                      |                                                              |            |                    | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Chhindwara&amp;pdf=/proc/Tech/CHHINDWARA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Chhindwara&amp;pdf=/proc/Tech/CHHINDWARA_2023.pdf</a> |
| 8  | Damoh                         | Tendukheda                                                  | CBWTF situated at Satna/Sagar District                       | Yes formed | No Gaps identified | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Damoh&amp;pdf=/proc/Tech/Damoh_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Damoh&amp;pdf=/proc/Tech/Damoh_2023.pdf</a>                     |
| 9  | Dewas                         | Bagli<br>Dewas<br>Kannod<br>Khategaon<br>Dhar<br>Dharampuri | CBWTF Ujjain District. (M/s. Hostech Eco Management Pvt Ltd) | Yes Formed | No Gaps identified | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dewas&amp;pdf=/proc/Tech/DEWAS_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dewas&amp;pdf=/proc/Tech/DEWAS_2023.pdf</a>                     |
| 10 | Dhar<br>(Whole District)      | Gandhwani<br>Kukshi<br>Manawar<br>Sardarpur                 | M/s Hoswin Incinerator Private Limited, Indore.              | Yes Formed | No Gaps identified | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dhar&amp;pdf=/proc/Tech/DHAR_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dhar&amp;pdf=/proc/Tech/DHAR_2023.pdf</a>                         |
| 11 | Dindori<br>(Whole District)   | Dindori<br>Shahpura                                         | CBWTF Facility at Dindori                                    | Yes Formed | No Gaps identified | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dindori&amp;pdf=/proc/Tech/DINDORI_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dindori&amp;pdf=/proc/Tech/DINDORI_2023.pdf</a>             |
| 12 | Khandwa                       | Harsud                                                      |                                                              | Yes Formed | No Gap identified  |                                                                                                                                                                                                         |

|    |            |         |                                                       |                                                                 |            |                   |                                                                                                                                                                                                                               |
|----|------------|---------|-------------------------------------------------------|-----------------------------------------------------------------|------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |            | Khandwa | M/s. Medisure<br>Incinerators,<br>Village<br>Pandhana | Bilankheda, Dist.<br>Khandwa                                    |            |                   | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Khandwa%20(East%20Nimar)&amp;pdf=/proc/Tech/Khandwa_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Khandwa%20(East%20Nimar)&amp;pdf=/proc/Tech/Khandwa_2023.pdf</a> |
| 13 | Harda      | Harda   | Khirkiya                                              | Not Found                                                       | Yes Formed | No Gap identified | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Harda&amp;pdf=/proc/Tech/harda_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Harda&amp;pdf=/proc/Tech/harda_2023.pdf</a>                                           |
|    |            |         | Timurni                                               |                                                                 |            |                   |                                                                                                                                                                                                                               |
|    |            |         | Babai                                                 |                                                                 |            |                   |                                                                                                                                                                                                                               |
|    |            |         | Bankheri                                              |                                                                 |            |                   |                                                                                                                                                                                                                               |
|    |            |         | Hoshangabad                                           |                                                                 |            |                   |                                                                                                                                                                                                                               |
| 14 | Hosangabad |         | Itarsi                                                | Not Found                                                       | Yes        | No Gap identified | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Hoshangabad&amp;pdf=/proc/Tech/Narmadapuram_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Hoshangabad&amp;pdf=/proc/Tech/Narmadapuram_2023.pdf</a>                 |
|    |            |         | Piparia                                               |                                                                 |            |                   |                                                                                                                                                                                                                               |
|    |            |         | Seonimalwa                                            |                                                                 |            |                   |                                                                                                                                                                                                                               |
|    |            |         | Sohagpur                                              |                                                                 |            |                   |                                                                                                                                                                                                                               |
| 15 | Indore     |         | Mhow                                                  | M/s. Hoswin<br>incinerator at<br>Sanwer<br>Road CBWTF<br>Indore | Yes Formed | No Gap identified | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Indore&amp;pdf=/proc/Tech/INDORE_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Indore&amp;pdf=/proc/Tech/INDORE_2023.pdf</a>                                       |
| 16 | Jabalpur   |         | Jabalpur                                              |                                                                 | Yes Formed | No Gap identified |                                                                                                                                                                                                                               |

|    |                         |             |                                                 |               |                   |                                                                                                                                                                                                             |
|----|-------------------------|-------------|-------------------------------------------------|---------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                         | Kundam      |                                                 |               |                   |                                                                                                                                                                                                             |
|    |                         | Majholi     |                                                 |               |                   |                                                                                                                                                                                                             |
|    |                         | Patan       | CBWTF Jabalpur District                         |               |                   | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jabalpur&amp;pdf=/proc/Tech/Jabalpur_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jabalpur&amp;pdf=/proc/Tech/Jabalpur_2023.pdf</a>             |
|    |                         | Shahpura    |                                                 |               |                   |                                                                                                                                                                                                             |
|    |                         | Shihora     |                                                 |               |                   |                                                                                                                                                                                                             |
| 17 | Jhabua (Whole District) | Jhabua      | M/s Hoswin Incinerator Private Limited, Indore. | Yes formed    | No Gap identified | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jhabua&amp;pdf=/proc/Tech/JHABUA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jhabua&amp;pdf=/proc/Tech/JHABUA_2023.pdf</a>                     |
|    |                         | Ranapur     |                                                 |               |                   |                                                                                                                                                                                                             |
| 18 | Katni (Whole District)  | Bahuriband  |                                                 |               |                   |                                                                                                                                                                                                             |
|    |                         | Dhimarkhera | CBWTF Jabalpur                                  | Yes formed    | No Gap identified | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Katni&amp;pdf=/proc/Tech/KATNI_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Katni&amp;pdf=/proc/Tech/KATNI_2023.pdf</a>                         |
|    |                         | Rathi       |                                                 |               |                   |                                                                                                                                                                                                             |
|    |                         | Bichhiya    |                                                 |               |                   |                                                                                                                                                                                                             |
| 19 | Mandla                  | Mandla      | CBWTF Seoni                                     | Yes Available | No Gap identified | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Mandla&amp;pdf=/proc/Tech/MANDLA.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Mandla&amp;pdf=/proc/Tech/MANDLA.pdf</a>                               |
|    |                         | Nainpur     |                                                 |               |                   |                                                                                                                                                                                                             |
|    |                         | Niwas       |                                                 |               |                   |                                                                                                                                                                                                             |
|    |                         | Gadarwara   |                                                 |               |                   |                                                                                                                                                                                                             |
| 20 | Narshingpur             | Gotegaon    | CBWTF Narshingpur                               | Yes Available | No Gap identified | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Narsinghpur&amp;pdf=/proc/Tech/NARSINGHPUR_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Narsinghpur&amp;pdf=/proc/Tech/NARSINGHPUR_2023.pdf</a> |
|    |                         | Kareli      |                                                 |               |                   |                                                                                                                                                                                                             |
|    |                         | Narshingpur |                                                 |               |                   |                                                                                                                                                                                                             |

|    |        |              |                                                 |               |                                                           |                                                                                                                                                                                           |
|----|--------|--------------|-------------------------------------------------|---------------|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |        | Tendukheda   |                                                 |               |                                                           |                                                                                                                                                                                           |
|    |        | Bareli       |                                                 |               |                                                           |                                                                                                                                                                                           |
|    |        | Begamganj    |                                                 |               |                                                           |                                                                                                                                                                                           |
|    |        | Gairatganj   |                                                 |               |                                                           |                                                                                                                                                                                           |
| 21 | Raisen | Goharganj    | CBWTF, Raisen                                   | Yes Formed    | No Gap identified                                         | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Raisen&amp;pdf=/proc/Tech/Raisen_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Raisen&amp;pdf=/proc/Tech/Raisen_2023.pdf</a>   |
|    |        | Raisen       |                                                 |               |                                                           |                                                                                                                                                                                           |
|    |        | Silvani      |                                                 |               |                                                           |                                                                                                                                                                                           |
|    |        | Udaipura     |                                                 |               |                                                           |                                                                                                                                                                                           |
| 22 | Sagar  | Deori        | CBWTF Sagar                                     | yes formed    | No Gap identified                                         | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sagar&amp;pdf=/proc/Tech/Sagar_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sagar&amp;pdf=/proc/Tech/Sagar_2023.pdf</a>       |
|    |        | Kesli        |                                                 |               |                                                           |                                                                                                                                                                                           |
|    |        | Ashta        |                                                 |               |                                                           |                                                                                                                                                                                           |
| 23 | Sehore | Budhni       | (M/s Environment Protection Corporation, Sehore | Yes Available | No Gap identified                                         | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sehore&amp;pdf=/proc/Tech/SEHO RE_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sehore&amp;pdf=/proc/Tech/SEHO RE_2023.pdf</a> |
|    |        | Ichawar      |                                                 |               |                                                           |                                                                                                                                                                                           |
|    |        | Nasrullaganj |                                                 |               |                                                           |                                                                                                                                                                                           |
|    |        | Sehore       |                                                 |               |                                                           |                                                                                                                                                                                           |
| 24 | Seoni  | Ghansaur     | CBWTF Seoni                                     | yes formed    | Bar code system is to be implemented with full efficiency | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Seoni&amp;pdf=/proc/Tech/Seoni_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Seoni&amp;pdf=/proc/Tech/Seoni_2023.pdf</a>       |
|    |        | Lakhnadon    |                                                 |               |                                                           |                                                                                                                                                                                           |

|    |            |                                                                                      |                                                                                                 |            |                   |                                                                                                                                                                                           |
|----|------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 25 | Umaria     | Bandhogarh<br>(Whole District)<br>Barwah                                             | CBWTF Umaria                                                                                    | yes formed | No Gap identified | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Umaria&amp;pdf=/proc/Tech/UMARIYA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Umaria&amp;pdf=/proc/Tech/UMARIYA_2023.pdf</a> |
| 26 | West Nimar | Bhagwanpura<br>Bhikangaon<br>Jhirniya<br>Kasrawas<br>Khargone<br>Maheshwar<br>Seagon | CBWTFs Facility established in Khandwa Dist.<br>M/s. Medisure Incinerators, Village-Bilankheda, | Yes formed | No Gap identified | <a href="https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Khargone.pdf">https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Khargone.pdf</a>                                                           |

\*Source: MPCB District environment plan

*Table A - 13 District-wise Status of E-Waste Management in Narmada Basin, Madhya Pradesh*

| S.No. | Districts | Block (ULB) | E-Waste Management |                                          |                     | References |
|-------|-----------|-------------|--------------------|------------------------------------------|---------------------|------------|
|       |           |             | Collection Points  | Linkage among Stakeholders to channelize | Gaps and challenges |            |

| recycling and dismantling |                          |                                                               |               |                                           |                                                                                                  |                                                                                                                                                                                                 |
|---------------------------|--------------------------|---------------------------------------------------------------|---------------|-------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                         | Alirajpur                | Alirajpur<br>Bhavara<br>Jobat                                 | Not available | Not linked                                | E Waste Collection Centres are required and linkage with recyclers and dismantlers are required. | <a href="https://www.mppcb.mp.gov.in/proc/Tech/h/DEP%20Alirajpur.pdf">https://www.mppcb.mp.gov.in/proc/Tech/h/DEP%20Alirajpur.pdf</a>                                                           |
| 2                         | Anuppur (Whole District) | District                                                      | Not available | Not linked                                | E Waste Collection Centres are required and linkage with recyclers and dismantlers are required. | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Anuppur&amp;pdf=/proc/Tech/DEP%20Anuppur.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Anuppur&amp;pdf=/proc/Tech/DEP%20Anuppur.pdf</a>   |
| 3                         | Balaghat                 | Baihar                                                        | Not available | Linkage with recyclers at Indore District | Awareness regarding regulation of illegal recycling/dismantling is to be done                    | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Balaghat&amp;pdf=/proc/Tech/BALAGHAT_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Balaghat&amp;pdf=/proc/Tech/BALAGHAT_2023.pdf</a> |
| 4                         | Barwani                  | Barwani<br>Niwali<br>Pansemal<br>Rajpur<br>Sendhwa<br>Thikiri | Available     | Not linked                                | ULBs are required to be linked with authorized recyclers/Dismantlers.                            | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Barwani&amp;pdf=/proc/Tech/Badwani_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Barwani&amp;pdf=/proc/Tech/Badwani_2023.pdf</a>     |
| 5                         |                          | Amla                                                          |               | Not linked                                |                                                                                                  |                                                                                                                                                                                                 |

|    |                                  |                                       |                                                                       |             |                                                                                  |                                                                                                                                                                                                         |
|----|----------------------------------|---------------------------------------|-----------------------------------------------------------------------|-------------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                  | Betul                                 | 01 collection                                                         |             |                                                                                  |                                                                                                                                                                                                         |
|    | Betul<br>(Whole<br>District)     | Bhaisdehi<br>Multai<br>Shahpur        | points<br>at District head<br>quarter<br>Betul                        |             | ULBs are required to be<br>linked with authorized<br>recyclers/Dismantlers.      | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Betul&amp;pdf=/proc/Tech/Betul_23.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Betul&amp;pdf=/proc/Tech/Betul_23.pdf</a>                         |
| 6  | Burhanpur                        | Nepanagar                             | Available at<br>district<br>Headquarter                               | Not Linked  | ULBs are required to be<br>linked with authorized<br>recyclers/Dismantlers.      | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Burhanpur&amp;pdf=/proc/Tech/BURHANPUR_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Burhanpur&amp;pdf=/proc/Tech/BURHANPUR_2023.pdf</a>     |
| 7  | Chindwara<br>(Whole<br>District) | Amarwara<br>Junnardev<br>Tamiya       | 02 collection<br>points<br>at District head<br>quarter<br>Chhindwara. | Linked      | No Gap identified                                                                | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Chhindwara&amp;pdf=/proc/Tech/CHHINDWARA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Chhindwara&amp;pdf=/proc/Tech/CHHINDWARA_2023.pdf</a> |
| 8  | Damoh                            | Tendukheda                            | Not available                                                         | Not linked  | ULBs are required to be<br>linked with the authorized<br>recyclers/ dismantlers. | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Damoh&amp;pdf=/proc/Tech/Damoh_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Damoh&amp;pdf=/proc/Tech/Damoh_2023.pdf</a>                     |
| 9  | Dewas                            | Bagli<br>Dewas<br>Kannod<br>Khategaon | Yes available                                                         | 20%v linked | ULBs are required to be<br>linked with authorized<br>recyclers/Dismantlers       | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dewas&amp;pdf=/proc/Tech/DEWAS_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dewas&amp;pdf=/proc/Tech/DEWAS_2023.pdf</a>                     |
| 10 |                                  | Dhar<br>Dharampuri                    | 3 collection<br>centers are                                           | Not Linked  |                                                                                  |                                                                                                                                                                                                         |



|    |                                |                                                       |               |            |                                                                                                                                                              |                                                                                                                                                                                                                               |
|----|--------------------------------|-------------------------------------------------------|---------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                | Gandhwani                                             | available in  |            |                                                                                                                                                              |                                                                                                                                                                                                                               |
|    | Dhar<br>(Whole<br>District)    | Kukshi<br>Manawar<br>Sardarpur                        | District      |            | ULBs are required to be<br>linked with authorized<br>recyclers/Dismantlers                                                                                   | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dhar&amp;pdf=/proc/Tech/DHAR_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dhar&amp;pdf=/proc/Tech/DHAR_2023.pdf</a>                                               |
| 11 | Dindori<br>(Whole<br>District) | Dindori<br>Shahpura                                   | Not available | Not linked | ULBs are required to be<br>linked with authorized<br>recyclers/Dismantlers                                                                                   | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dindori&amp;pdf=/proc/Tech/DIN_DORI_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dindori&amp;pdf=/proc/Tech/DIN_DORI_2023.pdf</a>                                 |
| 12 | Khandwa                        | Harsud<br>Khandwa<br>Pandhana                         | Yes Available | Not Linked | ULBs are required to be<br>linked with authorized<br>recyclers/Dismantlers.                                                                                  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Khandwa%20(East%20Nimar)&amp;pdf=/proc/Tech/Khandwa_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Khandwa%20(East%20Nimar)&amp;pdf=/proc/Tech/Khandwa_2023.pdf</a> |
| 13 | Harda                          | Harda<br>Khirkhya<br>Timurni                          | Not available | Not linked | Collection Centers are<br>required and "ULBs are<br>required to be linked with<br>authorized<br>recyclers/Dismantlers."                                      | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Harda&amp;pdf=/proc/Tech/harda_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Harda&amp;pdf=/proc/Tech/harda_2023.pdf</a>                                           |
| 14 | Hosangabad                     | Babai<br>Bankheri<br>Hoshangabad<br>Itarsi<br>Piparia | Not available | Not linked | E-Waste Collection<br>Point/collection centers<br>required to be Established<br>and ULBs required to be<br>linked with authorized<br>Recyclers/ Dismantlers. | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Hoshangabad&amp;pdf=/proc/Tech/Narmadapuram_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Hoshangabad&amp;pdf=/proc/Tech/Narmadapuram_2023.pdf</a>                 |

|    |                         |             |                                       |                                                                               |                                                                                                                                               |                                                                                                                                                                                                 |
|----|-------------------------|-------------|---------------------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                         | Seonimalwa  |                                       |                                                                               |                                                                                                                                               |                                                                                                                                                                                                 |
|    |                         | Sohagpur    |                                       |                                                                               |                                                                                                                                               |                                                                                                                                                                                                 |
| 15 | Indore                  | Mhow        | 4 E waste collection points available | Only Indore Municipal Corporation has linkage with the Recyclers/ Dismantlers | ULBs are required to be linked with authorized recyclers/Dismantlers                                                                          | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Indore&amp;pdf=/proc/Tech/INDORE_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Indore&amp;pdf=/proc/Tech/INDORE_2023.pdf</a>         |
|    |                         | Jabalpur    |                                       |                                                                               |                                                                                                                                               |                                                                                                                                                                                                 |
|    |                         | Kundam      |                                       |                                                                               |                                                                                                                                               |                                                                                                                                                                                                 |
| 16 | Jabalpur                | Majholi     | Yes available                         | E-waste generation, already linkage with recyclers at indore district.        | ULB are required to be linked with authorized recyclers/ Dismantlers                                                                          | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jabalpur&amp;pdf=/proc/Tech/Jabalpur_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jabalpur&amp;pdf=/proc/Tech/Jabalpur_2023.pdf</a> |
|    |                         | Patan       |                                       |                                                                               |                                                                                                                                               |                                                                                                                                                                                                 |
|    |                         | Shahpura    |                                       |                                                                               |                                                                                                                                               |                                                                                                                                                                                                 |
|    |                         | Shihora     |                                       |                                                                               |                                                                                                                                               |                                                                                                                                                                                                 |
|    |                         | Jhabua      |                                       |                                                                               | E-Waste Collection Point/collection centers required to be Established and ULBs required to be linked with authorized Recyclers/ Dismantlers. | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jhabua&amp;pdf=/proc/Tech/JHABUA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jhabua&amp;pdf=/proc/Tech/JHABUA_2023.pdf</a>         |
| 17 | Jhabua (Whole District) | Ranapur     | No e waste Collection center          | Not linked                                                                    |                                                                                                                                               |                                                                                                                                                                                                 |
|    |                         | Bahuriband  |                                       |                                                                               |                                                                                                                                               |                                                                                                                                                                                                 |
| 18 |                         | Dhimarkhera | Not Available                         | Not linked                                                                    | ULB's is required to hand over the e-waste collected in their jurisdiction to the                                                             |                                                                                                                                                                                                 |

|    |                           |                                                                 |                                                       |                                                      |                                                                                                                                   |                                                                                                                                                                                                             |
|----|---------------------------|-----------------------------------------------------------------|-------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | Katni<br>(Whole District) | Rathi                                                           |                                                       |                                                      | MPPCB authorized Ewaste recycler or dismantle by executing an MOU with the recycler/dismantler.                                   | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Katni&amp;pdf=/proc/Tech/KATNI_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Katni&amp;pdf=/proc/Tech/KATNI_2023.pdf</a>                         |
| 19 | Mandla                    | Bichhiya<br>Mandla<br>Nainpur<br>Niwas<br>Gadarwara<br>Gotegaon | Not available                                         | Linkage with authorized recyclers at Indore District | 1 E waste collection point and recycling is required and ULBs are required to be linked with authorized dismantler and recyclers. | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Mandla&amp;pdf=/proc/Tech/MANDLA.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Mandla&amp;pdf=/proc/Tech/MANDLA.pdf</a>                               |
| 20 | Narshingpur               | Kareli<br>Narshingpur<br>Tendukheda<br>Bareli<br>Begamganj      | Not available                                         | Linkage with authorized recyclers at Indore District | ULB are required to be linked with authorized recyclers/Dismantlers                                                               | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Narsinghpur&amp;pdf=/proc/Tech/NARSINGHPUR_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Narsinghpur&amp;pdf=/proc/Tech/NARSINGHPUR_2023.pdf</a> |
| 21 | Raisen                    | Gairatganj<br>Goharganj<br>Raisen<br>Silvani                    | 2 Collection points are available within the district | Linked with the authorized recyclers.                | No Gap identified                                                                                                                 | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Raisen&amp;pdf=/proc/Tech/Raisen_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Raisen&amp;pdf=/proc/Tech/Raisen_2023.pdf</a>                     |

|    |            |                             |                               |                                                   |                                                                      |                                                                                                                                                                                           |
|----|------------|-----------------------------|-------------------------------|---------------------------------------------------|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |            | Udaipura                    |                               |                                                   |                                                                      |                                                                                                                                                                                           |
| 22 | Sagar      | Deori                       | Not available                 | Not linked                                        | ULB are required to be linked with authorized recyclers/Dismantlers  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sagar&amp;pdf=/proc/Tech/Sagar_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sagar&amp;pdf=/proc/Tech/Sagar_2023.pdf</a>       |
|    |            | Kesli                       |                               |                                                   |                                                                      |                                                                                                                                                                                           |
|    |            | Ashta                       |                               |                                                   |                                                                      |                                                                                                                                                                                           |
| 23 | Sehore     | Budhni                      | 1 Collection center available | Linkage with authorized recycler/Dismantler       | No Gap identified                                                    | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sehore&amp;pdf=/proc/Tech/SEHORE_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sehore&amp;pdf=/proc/Tech/SEHORE_2023.pdf</a>   |
|    |            | Ichawar                     |                               |                                                   |                                                                      |                                                                                                                                                                                           |
|    |            | Nasrullaganj                |                               |                                                   |                                                                      |                                                                                                                                                                                           |
|    |            | Sehore                      |                               |                                                   |                                                                      |                                                                                                                                                                                           |
| 24 | Seoni      | Ghansaur                    | Not available                 | already linkage with recyclers at Indore district | Collection centers are required                                      | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Seoni&amp;pdf=/proc/Tech/Seoni_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Seoni&amp;pdf=/proc/Tech/Seoni_2023.pdf</a>       |
|    |            | Lakhnadon                   |                               |                                                   |                                                                      |                                                                                                                                                                                           |
| 25 | Umaria     | Bandhogarh (Whole District) | Not available                 | Not linked                                        | ULB are required to be linked with authorized recyclers/Dismantlers  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Umaria&amp;pdf=/proc/Tech/UMARIYA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Umaria&amp;pdf=/proc/Tech/UMARIYA_2023.pdf</a> |
|    |            | Barwah                      |                               |                                                   |                                                                      |                                                                                                                                                                                           |
| 26 | West Nimar | Bhagwanpura                 | Yes available                 | No linked                                         | ULBs are required to be linked with authorized recyclers/Dismantlers | <a href="https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Khargone.pdf">https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Khargone.pdf</a>                                                           |
|    |            | Bhikangaon                  |                               |                                                   |                                                                      |                                                                                                                                                                                           |
|    |            | Jhirniya                    |                               |                                                   |                                                                      |                                                                                                                                                                                           |
|    |            | Kasrawas                    |                               |                                                   |                                                                      |                                                                                                                                                                                           |

Khargone  
Maheshwar  
Seagon

\*Source: MPCB District environment plan

*Table A - 14 District-wise Status of Plastic Waste Management in Narmada Basin, Madhya Pradesh*

| Plastic waste Management |           |             |                         |                                                              |                                 |                                                                                      |                                                                                                                                     |
|--------------------------|-----------|-------------|-------------------------|--------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| S.No.                    | Districts | Block (ULB) | Door to Door Collection | Plastic waste collection centers                             | Plastic waste Disposal Facility | Gaps and Challenges                                                                  | References                                                                                                                          |
| 1                        | Alirajpur | Alirajpur   | Partial                 | 1 plastic waste collection centre is established at the MRF. | Not available                   | 100% Door to Door collection of PW, recycling and disposal facility is also required | <a href="https://www.mppcb.m.p.gov.in/proc/Tech/DEP%20Alirajpur.pdf">https://www.mppcb.m.p.gov.in/proc/Tech/DEP%20Alirajpur.pdf</a> |
|                          |           | Bhavara     | Partial                 | Not Available                                                | Not available                   | 100% Door to Door collection of PW, recycling and disposal facility is also required |                                                                                                                                     |
|                          |           | Jobat       | Partial                 | Not Available                                                | Not Available                   | 100% Door to Door collection of PW, recycling                                        |                                                                                                                                     |

|   |                             |          |               |                        |               |                                                                                                    |                                                                                                                                                                                                 |
|---|-----------------------------|----------|---------------|------------------------|---------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                             |          |               |                        |               | and disposal facility is also required                                                             |                                                                                                                                                                                                 |
| 2 | Anuppur<br>(Whole District) | District | Not Available | Not Available          | Not Available | PW recycling facility is needed, educational awareness needed, and PW collection centers required. | <a href="https://www.mppcb.mpp.gov.in/PdfView.aspx?h=Anuppur&amp;pdf=/proc/Tech/DEP%20Anuppur.pdf">https://www.mppcb.mpp.gov.in/PdfView.aspx?h=Anuppur&amp;pdf=/proc/Tech/DEP%20Anuppur.pdf</a> |
| 3 | Balaghat                    | Baihar   | full          | Not Available          | Not Available | 01 Plastic Waste Collection centers is required.                                                   | <a href="https://www.mppcb.mpp.gov.in/PdfView.aspx?h=Balaghat&amp;pdf=/proc/Tech/BALAGHAT2023.pdf">https://www.mppcb.mpp.gov.in/PdfView.aspx?h=Balaghat&amp;pdf=/proc/Tech/BALAGHAT2023.pdf</a> |
|   |                             | Barwani  | 100%          | Collected door to door | Available     | No gap identified                                                                                  |                                                                                                                                                                                                 |
|   |                             | Niwali   | 100%          | Not available          | Not Available | Plastic waste collection and disposal centers are required.                                        |                                                                                                                                                                                                 |
| 4 | Barwani                     | Pansemal | 100%          | Not available          | Available     | PW collection needs to be opened                                                                   | <a href="https://www.mppcb.mpp.gov.in/PdfView.aspx?h=Barwani&amp;pdf=/proc/Tech/Badwani_2023.pdf">https://www.mppcb.mpp.gov.in/PdfView.aspx?h=Barwani&amp;pdf=/proc/Tech/Badwani_2023.pdf</a>   |
|   |                             | Rajpur   | 100%          | Not available          | Available     | PW collection needs to be opened                                                                   |                                                                                                                                                                                                 |
|   |                             | Sendhwa  | 100%          | Not available          | Not Available | Plastic waste collection and disposal centers are required.                                        |                                                                                                                                                                                                 |

|   |                            |           |      |                                        |               |                                                                                                                                                    |                                                                                                                                                                                                           |
|---|----------------------------|-----------|------|----------------------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                            | Thikiri   | 100% | Not available                          | Not Available | Plastic waste collection and disposal centers are required.                                                                                        |                                                                                                                                                                                                           |
|   |                            | Amla      |      |                                        |               |                                                                                                                                                    |                                                                                                                                                                                                           |
| 5 | Betul (Whole District)     | Betul     |      |                                        |               | Collection of plastic waste from Panchayat level to be established.                                                                                | <a href="https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Betul&amp;pdf=/proc/Tech/Betul_23.pdf">https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Betul&amp;pdf=/proc/Tech/Betul_23.pdf</a>                         |
|   |                            | Bhaisdehi | 100% | Available only at district headquarter | Available     |                                                                                                                                                    |                                                                                                                                                                                                           |
|   |                            | Multai    |      |                                        |               |                                                                                                                                                    |                                                                                                                                                                                                           |
|   |                            | Shahpur   |      |                                        |               |                                                                                                                                                    |                                                                                                                                                                                                           |
| 6 | Burhanpur                  | Nepanagar | 100% | Not required                           | Not available | Access to plastic waste disposal facility shall be provided                                                                                        | <a href="https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Burhanpur&amp;pdf=/proc/Tech/BURHANPUR_2023.pdf">https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Burhanpur&amp;pdf=/proc/Tech/BURHANPUR_2023.pdf</a>     |
|   |                            | Amarwara  |      |                                        |               | Transfer points and material recovery facility to be developed at identified locations. and Involvement of informal sector /NGO shall be taken up. | <a href="https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Chhindwara&amp;pdf=/proc/Tech/CHHINDWARA_2023.pdf">https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Chhindwara&amp;pdf=/proc/Tech/CHHINDWARA_2023.pdf</a> |
| 7 | Chindwara (Whole District) | Junnardev | 100% | Yes, only at district head quarter.    | Yes available |                                                                                                                                                    |                                                                                                                                                                                                           |
|   |                            | Tamiya    |      |                                        |               |                                                                                                                                                    |                                                                                                                                                                                                           |

|    |                       |                 |               |               |                                                       |                                                              |                                                                                                                                                                                       |
|----|-----------------------|-----------------|---------------|---------------|-------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8  | Damoh                 | Tendukheda      | 100%          | Not Required  | Not available                                         | Plastic waste collection and disposal centers are required.  | <a href="https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Damoh&amp;pdf=/proc/Tech/Damoh_2023.pdf">https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Damoh&amp;pdf=/proc/Tech/Damoh_2023.pdf</a> |
|    |                       | Bagli           | 100%          | Not Required  | Not Available                                         | PW collection and disposal centers are required.             |                                                                                                                                                                                       |
| 9  | Dewas                 |                 |               |               | Plastic Waste is being recycled to                    |                                                              |                                                                                                                                                                                       |
|    |                       | Dewas           | Not Available | Not Available | Use in Road Making and Co Processing in Cement Plants | Door-to-door collection and collection centers are required. | <a href="https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Dewas&amp;pdf=/proc/Tech/DEWAS_2023.pdf">https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Dewas&amp;pdf=/proc/Tech/DEWAS_2023.pdf</a> |
|    |                       | Kannod          | 100%          | Not Required  | Not Available                                         | PW collection and disposal centers are required.             |                                                                                                                                                                                       |
| 10 | Dhar (Whole District) | Khategaon       | 100%          | Not Required  | Not Available                                         | Plastic waste collection and disposal centers are required.  |                                                                                                                                                                                       |
|    |                       | Dhar Dharampuri | 100%          | Yes available | Plastic waste sent to                                 | ULB's and village panchayat must collect the                 | <a href="https://www.mppcb.m.p.gov.in/PdfView.aspx">https://www.mppcb.m.p.gov.in/PdfView.aspx</a>                                                                                     |



|    |                          |           |         |               |                                      |                                                           |                                                                                                                                                                                                                                 |
|----|--------------------------|-----------|---------|---------------|--------------------------------------|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                          | Gandhwani |         |               | cement plant for co processing       | plastic waste generated by their jurisdiction             | <a href="#">?h=Dhar&amp;pdf=/proc/Tech/DHAR_2023.pdf</a>                                                                                                                                                                        |
|    |                          | Kukshi    |         |               |                                      |                                                           |                                                                                                                                                                                                                                 |
|    |                          | Manawar   |         |               |                                      |                                                           |                                                                                                                                                                                                                                 |
|    |                          | Sardarpur |         |               |                                      |                                                           |                                                                                                                                                                                                                                 |
|    |                          | Dindori   |         |               |                                      |                                                           | <a href="https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Dindori&amp;pdf=/proc/Tech/DINDORI_2023.pdf">https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Dindori&amp;pdf=/proc/Tech/DINDORI_2023.pdf</a>                                   |
| 11 | Dindori (Whole District) | Shahpura  | Partial | Not available | District has access to PW recycling. | Door-to-door collection and collection centers are needed |                                                                                                                                                                                                                                 |
|    |                          | Harsud    | 100%    | Not required  | Not Available                        | PW Collection center and disposal facility is required    | <a href="https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Khandwa%20(East%20Nimar)&amp;pdf=/proc/Tech/Khandwa_2023.pdf">https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Khandwa%20(East%20Nimar)&amp;pdf=/proc/Tech/Khandwa_2023.pdf</a> |
| 12 | Khandwa                  | Khandwa   | 100%    | Available     | Not Available                        | PW disposal facility is required                          |                                                                                                                                                                                                                                 |
|    |                          | Pandhana  | 100%    | Not required  | Not Available                        | PW disposal facility is required                          |                                                                                                                                                                                                                                 |
|    |                          | Harda     | 100%    | Available     | Yes available                        | No gap identified                                         | <a href="https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Harda&amp;pdf=/proc/Tech/harda_2023.pdf">https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Harda&amp;pdf=/proc/Tech/harda_2023.pdf</a>                                           |
| 13 | Harda                    | Khirkhya  | 100%    | Available     | Yes available                        | No gap identified                                         |                                                                                                                                                                                                                                 |
|    |                          | Timurni   | 100%    | Available     | Yes available                        | No gap identified                                         |                                                                                                                                                                                                                                 |
| 14 | Hosangabad               | Babai     | 100%    | Yes available | Recycling facility is available      | No gap identified                                         | <a href="https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Hoshangabad&amp;pdf">https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Hoshangabad&amp;pdf</a>                                                                                   |

|    |        |             |      |                           |                                                                                     |                   |                                                                                                                                                   |
|----|--------|-------------|------|---------------------------|-------------------------------------------------------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
|    |        | Bankheri    | 100% | Available at MRF centers  | Available in District Headquarters                                                  | No gap identified | <a href="#">=/proc/Tech/Narmadapuram_2023.pdf</a>                                                                                                 |
|    |        | Hoshangabad | 100% | Yes available             | Recycling facility is available                                                     | No gap identified |                                                                                                                                                   |
|    |        | Itarsi      | 90%  | Collection at MRF centers | Available in District Headquarters                                                  | No gap identified |                                                                                                                                                   |
|    |        | Piparia     | 100% | Yes available             | District has adequate No. of Plastic Waste recycling /utilization or disposal units | No gap identified |                                                                                                                                                   |
|    |        | Seonimalwa  | 100% | Collection at MRF centers | Available in District Headquarters                                                  | No gap identified |                                                                                                                                                   |
|    |        | Sohagpur    | 100% | Yes available             | Available                                                                           | No gap identified |                                                                                                                                                   |
| 15 | Indore | Mhow        | 100% | Yes, Collected in MRFs    | disposal done by the help of dust cleaner,                                          | No gap identified | <a href="https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Indore&amp;pdf=/proc/">https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Indore&amp;pdf=/proc/</a> |

|    |          |          |               |                       |                                                    |                                                  |
|----|----------|----------|---------------|-----------------------|----------------------------------------------------|--------------------------------------------------|
|    |          |          |               | shredding,<br>bailing |                                                    | Tech/INDORE_2023.pdf                             |
| 16 | Jabalpur | Jabalpur | 100%          | Available             | Plastic waste is disposed to Waste to Energy plant | 01 Plastic Waste Collection centers is required. |
|    |          | Kundam   | Not Available | Not Available         | Not Available                                      | Not Available                                    |
|    |          | Majholi  | 100%          | Yes available         | Plastic waste is disposed to Waste to Energy plant | 01 Plastic Waste Collection centers is required. |
|    |          | Patan    | 100%          | Available             | Plastic waste is disposed to Waste to Energy plant | 01 Plastic Waste Collection centers is required. |
|    |          | Shahpura | 100%          | Available             | Plastic waste is disposed to Waste to Energy plant | 01 Plastic Waste Collection centers is required. |

[https://www.mppcb.m  
p.gov.in/PdfView.aspx  
?h=Jabalpur&pdf=/pro  
c/Tech/Jabalpur\\_2023.  
pdf](https://www.mppcb.m<br/>p.gov.in/PdfView.aspx<br/>?h=Jabalpur&pdf=/pro<br/>c/Tech/Jabalpur_2023.<br/>pdf)

|    |                         |                                    |      |               |                                                                               |                                                                                                                                                    |                                                                                                                                                                                           |
|----|-------------------------|------------------------------------|------|---------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                         | Shihora                            | 100% | Available     | Plastic waste is disposed to Waste to Energy plant                            | 01 Plastic Waste Collection centers is required.                                                                                                   |                                                                                                                                                                                           |
| 17 | Jhabua (Whole District) | Jhabua<br>Ranapur                  | 100% | Available     | Yes, Plastic waste send to cement plant for coprocessing                      | No gap identified                                                                                                                                  | <a href="https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Jhabua&amp;pdf=/proc/Tech/JHABUA_2023.pdf">https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Jhabua&amp;pdf=/proc/Tech/JHABUA_2023.pdf</a> |
| 18 | Katni (Whole District)  | Bahuriband<br>Dhimarkhera<br>Rathi | 100% | Not available | Yes, District has access to PW recycling / utilization or disposal facilities | Collection centers are required                                                                                                                    | <a href="https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Katni&amp;pdf=/proc/Tech/KATNI_2023.pdf">https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Katni&amp;pdf=/proc/Tech/KATNI_2023.pdf</a>     |
| 19 | Mandla                  | Bichhiya                           | 100% | Not available | Not Available                                                                 | Transfer points and material recovery facility to be developed at identified locations. and Involvement of informal sector /NGO shall be taken up. | <a href="https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Mandla&amp;pdf=/proc/Tech/MANDLA.pdf">https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Mandla&amp;pdf=/proc/Tech/MANDLA.pdf</a>           |

|    |             |             |      |               |               |                                                        |                                                                                                                                                                                                                                                                             |
|----|-------------|-------------|------|---------------|---------------|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |             | Mandla      | 100% | Not available | Not Available | 01 Plastic Waste<br>Collection centers is<br>required. |                                                                                                                                                                                                                                                                             |
|    |             | Nainpur     | 100% | Not available | Not Available | PW processing facility is<br>required                  |                                                                                                                                                                                                                                                                             |
|    |             | Niwas       | 100% | Not available | Not Available | 01 Plastic Waste<br>Collection centers is<br>required. |                                                                                                                                                                                                                                                                             |
|    |             | Gadarwara   | 100% | Available     | Not Available | PW processing unit is<br>required                      |                                                                                                                                                                                                                                                                             |
|    |             | Gotegaon    | 100% | Not Available | Not Available | PW processing unit is<br>required                      |                                                                                                                                                                                                                                                                             |
| 20 | Narshingpur | Kareli      | 100% | Not Available | Not Available | PW processing unit is<br>required                      | <a href="https://www.mppcb.m&lt;br/&gt;p.gov.in/PdfView.aspx&lt;br/&gt;?h=Narsinghpur&amp;pdf=&lt;br/&gt;/proc/Tech/NARSING&lt;br/&gt;HPUR_2023.pdf">https://www.mppcb.m<br/>p.gov.in/PdfView.aspx<br/>?h=Narsinghpur&amp;pdf=<br/>/proc/Tech/NARSING<br/>HPUR_2023.pdf</a> |
|    |             | Narshingpur | 100% | Not Available | Not available | PW processing unit is<br>required                      |                                                                                                                                                                                                                                                                             |
|    |             | Tendukheda  | 100% | Not Available | Not Available | PW processing unit is<br>required                      |                                                                                                                                                                                                                                                                             |
| 21 | Raisen      | Bareli      | 100% | Available     | Not Available | No gap identified                                      | <a href="https://www.mppcb.m&lt;br/&gt;p.gov.in/PdfView.aspx">https://www.mppcb.m<br/>p.gov.in/PdfView.aspx</a>                                                                                                                                                             |
|    |             | Begamganj   | 100% | Available     | Available     | No gap identified                                      | <a href="https://www.mppcb.m&lt;br/&gt;p.gov.in/PdfView.aspx">https://www.mppcb.m<br/>p.gov.in/PdfView.aspx</a>                                                                                                                                                             |

|    |       |            |               |               |                                                                                      |                                                              |
|----|-------|------------|---------------|---------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------|
|    |       |            |               |               | District has adequate                                                                | <a href="#">?h=Raisen&amp;pdf=/proc/Tech/Raisen_2023.pdf</a> |
|    |       | Gairatganj | 80%           | Available     | No. of Plastic Waste recycling / utilization or disposal units                       | Door to door collection efficiency require to be 100%        |
|    |       | Goharganj  | Not Available | Not Available | Not Available                                                                        | Not Available                                                |
|    |       | Raisen     | 90%           | Available     | District has adequate No. of Plastic Waste recycling / utilization or disposal units | Door to door collection efficiency require to be 100%        |
|    |       | Silvani    | 80%           | Not available | Available                                                                            | Plastic Waste Collection centers are required.               |
|    |       | Udaipura   | 100%          | Not available | Available                                                                            | Plastic Waste Collection centers is required.                |
| 22 | Sagar | Deori      | 100%          | Yes available | Yes available                                                                        | No gap identified                                            |

|    |        |              |               |                                   |                                                   |                                                                                             |                                                                                                                                                                                           |
|----|--------|--------------|---------------|-----------------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |        | Kesli        | Not Available | Not Available                     | Not Available                                     | Not Available                                                                               | <a href="https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Sagar&amp;pdf=/proc/Tech/Sagar_2023.pdf">https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Sagar&amp;pdf=/proc/Tech/Sagar_2023.pdf</a>     |
|    |        | Ashta        | 95%           | Not available                     | Not Available                                     | Plastic Waste Collection centers and processing units is required.                          |                                                                                                                                                                                           |
|    |        | Budhni       | Not Available | Not Available                     | Not Available                                     | Not Available                                                                               | <a href="https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Sehore&amp;pdf=/proc/Tech/SEHORE_2023.pdf">https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Sehore&amp;pdf=/proc/Tech/SEHORE_2023.pdf</a> |
| 23 | Sehore | Ichawar      | Not Available | Not Available                     | Not Available                                     | Not Available                                                                               |                                                                                                                                                                                           |
|    |        | Nasrullaganj | 100%          | Local body setup own MRF facility | Not Available                                     | Plastic Waste processing units are required.                                                |                                                                                                                                                                                           |
|    |        | Sehore       | 60%           | 1 available                       | Plastic waste is segregated and sell to recyclers | Plastic Waste Collection centers and processing units is required.                          |                                                                                                                                                                                           |
|    |        | Ghansaur     | 85%           | Not available                     | Not Available                                     | Plastic Waste door to door collection, Collection centers and processing units are required | <a href="https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Seoni&amp;pdf=/proc/Tech/Seoni_2023.pdf">https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Seoni&amp;pdf=/proc/Tech/Seoni_2023.pdf</a>     |
| 24 | Seoni  | Lakhnadon    | 100%          | Not available                     | Not Available                                     | Plastic Waste Collection centers and                                                        |                                                                                                                                                                                           |

|    |            |                             |               |                          |                                                                                                                               |                                                  |                                                                                                                                                                                             |
|----|------------|-----------------------------|---------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |            |                             |               |                          |                                                                                                                               | processing units are required                    |                                                                                                                                                                                             |
|    |            |                             |               |                          | District has access to PW recycling through the Material recovery facility established at dump sites of every ULB in district |                                                  | <a href="https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Umaria&amp;pdf=/proc/Tech/UMARIYA_2023.pdf">https://www.mppcb.m.p.gov.in/PdfView.aspx?h=Umaria&amp;pdf=/proc/Tech/UMARIYA_2023.pdf</a> |
| 25 | Umaria     | Bandhogarh (Whole District) | Partial       | Available at local level |                                                                                                                               | No gap identified                                |                                                                                                                                                                                             |
|    |            | Barwah                      | 100%          | Not required             | Not Available                                                                                                                 | 01 Plastic Waste Collection centers is required. |                                                                                                                                                                                             |
| 26 | West Nimar | Bhagwanpura                 | Not Available | Not Available            | Not Available                                                                                                                 | Not Available                                    | <a href="https://www.mppcb.m.p.gov.in/proc/Tech/DEP%20Khargone.pdf">https://www.mppcb.m.p.gov.in/proc/Tech/DEP%20Khargone.pdf</a>                                                           |
|    |            | Bhikangaon                  | 100%          | Not required             | Not Available                                                                                                                 | Plastic Waste processing units are required      |                                                                                                                                                                                             |
|    |            | Jhirniya                    | Not Available | Not Available            | Not Available                                                                                                                 | Not Available                                    |                                                                                                                                                                                             |



|           |               |               |               |                                             |
|-----------|---------------|---------------|---------------|---------------------------------------------|
| Kasrawas  | 100%          | Not required  | Not Available | Plastic Waste processing units are required |
| Khargone  | 100%          | Yes available | Not Available | Plastic Waste processing units are required |
| Maheshwar | 100%          | Not required  | Not Available | Plastic Waste processing units are required |
| Seagon    | Not Available | Not Available | Not Available | Not Available                               |

\*Source: MPCB District environment plan

*Table A - 15 District-wise Status of C&D Waste Management in Narmada Basin, Madhya Pradesh*

| C&D Waste Management |           |             |                                                                           |                    |                                                         |                                           |                                                                                                                                   |
|----------------------|-----------|-------------|---------------------------------------------------------------------------|--------------------|---------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| S.No.                | Districts | Block (ULB) | Collection and deposition facility                                        | Recycling Facility | Use of recycled waste                                   | Gaps and Challenges                       | References                                                                                                                        |
| 1                    | Alirajpur | Alirajpur   | Available                                                                 | Not available      | C&D waste is being used to dump in the low-lying areas. | C&D waste processing unit required        |                                                                                                                                   |
|                      |           | Bhavara     | C&D waste is collected separately and is used to dump in low lying areas, | Not available      | C&D waste is being used to dump in the low-lying areas. | Not available                             | <a href="https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Alirajpur.pdf">https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Alirajpur.pdf</a> |
|                      |           | Jobat       | Separate collection is done deposition points are not required            | Not Available      | C&D waste is being used to dump in the low-lying areas. | C&D waste recycling facility is required. |                                                                                                                                   |

|   |                             |          |               |               |                                                                                                                      |                                                                                                           |                                                                                                                                                                                                 |
|---|-----------------------------|----------|---------------|---------------|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 | Anuppur<br>(Whole District) | District | Not Available | Not Available | Currently, C&D waste is mostly utilized by the local bodies for facilitating different repair and construction works | C&D waste collection and recycling facilities are required.                                               | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Anuppur&amp;pdf=/proc/Tech/DEP%20Anuppur.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Anuppur&amp;pdf=/proc/Tech/DEP%20Anuppur.pdf</a>   |
| 3 | Balaghat                    | Baihar   | Not required  | Not required  | Not required                                                                                                         | Quantity of C&D waste generator is very less                                                              | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Balaghat&amp;pdf=/proc/Tech/BALAGHAT_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Balaghat&amp;pdf=/proc/Tech/BALAGHAT_2023.pdf</a> |
| 4 | Barwani                     | Barwani  | Not Available | Not Available | No Information                                                                                                       | Separate collection of C&D waste, establishment of C&D waste collection & recycling facility is required. | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Barwani&amp;pdf=/proc/Tech/Barwani_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Barwani&amp;pdf=/proc/Tech/Barwani_2023.pdf</a>     |
|   |                             | Niwali   | Not Available | Not Available | No Information                                                                                                       | C&D waste recycling                                                                                       |                                                                                                                                                                                                 |

|   |                        |                            |                            |               |                |                                         |                                                                                                                             |
|---|------------------------|----------------------------|----------------------------|---------------|----------------|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
|   |                        |                            |                            |               |                | facility to be established.             |                                                                                                                             |
|   |                        | Pansemal                   | Not Available              | Not Available | No Information | C&D waste process plant to be required. |                                                                                                                             |
|   |                        | Rajpur                     | Not Available              | Not Available | No Information | C&D waste process plant to be required. |                                                                                                                             |
|   |                        | Sendhwa                    | Not Available              | Not Available | No Information | C&D waste process plant to be required. |                                                                                                                             |
|   |                        | Thikiri                    | Not Available              | Not Available | No Information | C&D waste process plant to be required. |                                                                                                                             |
| 5 | Betul (Whole District) | Amla<br>Betul<br>Bhaisdehi | Yes, available in all ULBs | Not Available | Not available  | Local C&D waste management plans can be | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Betul&amp;p">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Betul&amp;p</a> |

|   |                            |                                 |                       |                                                                             |                                                        |                                                                        |                                                                                                                                                                                                         |
|---|----------------------------|---------------------------------|-----------------------|-----------------------------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                            | Multai                          |                       |                                                                             |                                                        | integrated to develop common collection and recycling facilities       | <a href="#">df=/proc/Tech/Betu_1_23.pdf</a>                                                                                                                                                             |
|   |                            | Shahpur                         |                       |                                                                             |                                                        |                                                                        |                                                                                                                                                                                                         |
| 6 | Burhanpur                  | Nepanagar                       | Not available         | Not available                                                               | C&D waste is being used to dump in the low-lying areas | C&D waste processing plant to be required.                             | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Burhanpur&amp;pdf=/proc/Tech/BURHANPUR_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Burhanpur&amp;pdf=/proc/Tech/BURHANPUR_2023.pdf</a>     |
| 7 | Chindwara (Whole District) | Amarwara<br>Junnardev<br>Tamiya | Available at all ULBs | YES M/s dadaji traders sonpur teh. + dist. Chhindwara third party contract. | Not available                                          | C&D waste processing plants are also to be established in village area | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Chhindwara&amp;pdf=/proc/Tech/CHHINDWARA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Chhindwara&amp;pdf=/proc/Tech/CHHINDWARA_2023.pdf</a> |
| 8 | Damoh                      | Tendukheda                      | Available             | Not available                                                               | Dumped to low lying areas                              | C&D waste processing plant required.                                   | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Damoh&amp;pdf=/proc/Tech/Damoh_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Damoh&amp;pdf=/proc/Tech/Damoh_2023.pdf</a>                     |
| 9 | Dewas                      | Bagli                           | Not Available         | Not required                                                                | Dumped to low lying areas                              | C&D waste processing                                                   | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dewas&amp;pdf=/proc/Tech/Dewas_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dewas&amp;pdf=/proc/Tech/Dewas_2023.pdf</a>                     |

|    |                       |                                           |                                    |               |                               |                                                                                                            |                                                                                                                                                                                 |
|----|-----------------------|-------------------------------------------|------------------------------------|---------------|-------------------------------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                       | Dewas                                     | 1 collection facility is available | Not available | Proposed to make paver blocks | plant required.<br>required new 02collection point in city and C&D Waste recycling facility required01 No. | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dewas&amp;pdf=/proc/Tech/DEWAS_2023.pdf">w.aspx?h=Dewas&amp;pdf=/proc/Tech/DEWAS_2023.pdf</a>                               |
|    |                       | Kannod                                    | Not Available                      | Not required  | Dumped to low lying areas     | C&D waste processing plant required.                                                                       |                                                                                                                                                                                 |
|    |                       | Khategaon                                 | Not Available                      | Not required  | Dumped to low lying areas     | C&D waste processing plant required.                                                                       |                                                                                                                                                                                 |
| 10 | Dhar (Whole District) | Dhar<br>Dharamपुरी<br>Gandhwani<br>Kukshi | Available in each UIBs             | Not Available | Filling Low lying areas       | C&D waste processing plant required.                                                                       | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dhar&amp;pdf=/proc/Tech/DHAR_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dhar&amp;pdf=/proc/Tech/DHAR_2023.pdf</a> |

|    |                             |           |               |               |                                                                                    |                                                |                                                                                                                                                                                                                               |
|----|-----------------------------|-----------|---------------|---------------|------------------------------------------------------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                             | Manawar   |               |               |                                                                                    |                                                |                                                                                                                                                                                                                               |
|    |                             | Sardarpur |               |               |                                                                                    |                                                |                                                                                                                                                                                                                               |
|    |                             | Dindori   |               |               |                                                                                    |                                                | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dindori&amp;pdf=/proc/Tech/DINDORI_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dindori&amp;pdf=/proc/Tech/DINDORI_2023.pdf</a>                                   |
| 11 | Dindori<br>(Whole District) | Shahpura  | Not available | Not Available | Utilized by local bodies for facilitating different repair and construction works. | C&D waste processing plant required.           |                                                                                                                                                                                                                               |
|    |                             |           |               |               |                                                                                    | C&D waste recycling facilities be established. |                                                                                                                                                                                                                               |
|    |                             | Harsud    | Not required  | Not required  | Dumped in low lying areas                                                          | and C&D waste processing Plant required.       | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Khandwa%20(East%20Nimar)&amp;pdf=/proc/Tech/Khandwa_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Khandwa%20(East%20Nimar)&amp;pdf=/proc/Tech/Khandwa_2023.pdf</a> |
| 12 | Khandwa                     |           |               |               |                                                                                    | C&D waste recycling facilities be established. |                                                                                                                                                                                                                               |
|    |                             | Khandwa   | Not Available | Not available | Dumped in low lying areas                                                          | and C&D waste processing                       |                                                                                                                                                                                                                               |

|    |       |          |               |               |                                                                                           |                                                |
|----|-------|----------|---------------|---------------|-------------------------------------------------------------------------------------------|------------------------------------------------|
|    |       |          |               |               |                                                                                           | Plant required.                                |
|    |       |          |               |               |                                                                                           | C&D waste recycling facilities be established. |
|    |       | Pandhana | Not Required  | Not required  | Dumped in low lying areas                                                                 | and C&D waste processing Plant required.       |
|    |       | Harda    | Yes Available | Yes available | Collected and stored C&D waste is reused for filling of low-lying areas and road filling. | No Gap identified                              |
| 13 | Harda | Khirkiya | Yes Available | Yes available | Collected and stored C&D waste is reused for filling of low-lying areas and road filling. | No Gap identified                              |
|    |       | Timurni  | Yes Available | Yes available | Collected and stored C&D waste is reused for filling of low-lying areas and road filling. | No Gap identified                              |

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|    |            |             |                                                              |               |                                                                                                                |                                                                 |
|----|------------|-------------|--------------------------------------------------------------|---------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| 14 | Hosangabad | Babai       | Provided at dump site                                        | Not Available | Used for Construction activities                                                                               | C&D waste processing facility is required                       |
|    |            | Bankheri    | Not available                                                | Not Available | Used for construction activities in PM Awas Yojna                                                              | C&D waste recycling facility available within Municipal Council |
|    |            | Hoshangabad | Separate collection point of C&D Waste Provided at dump site | Not Available | Collected and stored C&D waste is reused for filling of land restoration, road & PMAY construction activities. | C&D waste recycling facility available within Municipal Council |
|    |            | Itarsi      | Provided at dump site                                        | Not Available | Used for Construction activities                                                                               | C&D waste processing facility is required                       |
|    |            | Piparia     | Provided at dump site                                        | Not Available | Used for Construction activities                                                                               | C&D waste processing                                            |

[https://www.mppcb.mp.gov.in/PdfView.aspx?h=Hoshangabad&pdf=/proc/Tech/Narmadapuram\\_2023.pdf](https://www.mppcb.mp.gov.in/PdfView.aspx?h=Hoshangabad&pdf=/proc/Tech/Narmadapuram_2023.pdf)

|    |          |            |                                                              |               |                                                                                                                |                                                          |                                                                                                                                                                                         |
|----|----------|------------|--------------------------------------------------------------|---------------|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |          |            |                                                              |               |                                                                                                                | facility is required                                     |                                                                                                                                                                                         |
|    |          | Seonimalwa | Separate collection point of C&D Waste Provided at dump site | Not Available | Used for Construction activities                                                                               | C&D waste processing facility is required                |                                                                                                                                                                                         |
|    |          | Sohagpur   | Not available                                                | Not Available | Collected and stored C&D waste is reused for filling of land restoration, road & PMAY construction activities. | C&D waste collection and processing facility is required |                                                                                                                                                                                         |
| 15 | Indore   | Mhow       | Not required                                                 | Not required  | Not required                                                                                                   | C&D waste collection and processing facility is required | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Indore&amp;pdf=/proc/Tech/INDORE_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Indore&amp;pdf=/proc/Tech/INDORE_2023.pdf</a> |
| 16 | Jabalpur | Jabalpur   | Available                                                    | Yes available | Used in nonstructural concrete                                                                                 | No Gap identified                                        | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jabalpur">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jabalpur</a>                                                                   |
|    |          | Kundam     | Not available                                                | Not available | Not available                                                                                                  | Not available                                            |                                                                                                                                                                                         |

|    |                               |                                    |                                            |               |                                                                                                         |                                                |                                                                                                                                                                                                             |
|----|-------------------------------|------------------------------------|--------------------------------------------|---------------|---------------------------------------------------------------------------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                               | Majholi                            | Not required<br>Collection is<br>very less | Not required  | Not required                                                                                            | No Gap<br>identified                           | <a href="#">&amp;pdf=/proc/Tech/J<br/>abalpur_2023.pdf</a>                                                                                                                                                  |
|    |                               | Patan                              | Not required<br>small town                 | Not required  | Not required                                                                                            | No Gap<br>identified                           |                                                                                                                                                                                                             |
|    |                               | Shahpura                           | Not required                               | Not required  | Not required                                                                                            | No Gap<br>identified                           |                                                                                                                                                                                                             |
|    |                               | Shihora                            | Not required                               | Not required  | Not required                                                                                            | No Gap<br>identified                           |                                                                                                                                                                                                             |
| 17 | Jhabua<br>(Whole<br>District) | Jhabua<br><br>Ranapur              | Not available                              | Not available | Filling into low lying areas                                                                            | C&D waste<br>processing<br>unit is<br>required | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jhabua&amp;pdf=/proc/Tech/JHABUA_2023.pdf">https://www.mppcb<br/>.mp.gov.in/PdfVie<br/>w.aspx?h=Jhabua&amp;<br/>pdf=/proc/Tech/JH<br/>ABUA_2023.pdf</a> |
| 18 | Katni (Whole<br>District)     | Bahuriband<br>Dhimarkhera<br>Rathi | Not available                              | Not available | ULB's are currently collecting<br>the C& D waste is Filling into<br>Low lying areas in the<br>district. | C&D waste<br>processing<br>unit is<br>required | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Katni&amp;pdf=/proc/Tech/KATNI_2023.pdf">https://www.mppcb<br/>.mp.gov.in/PdfVie<br/>w.aspx?h=Katni&amp;p<br/>df=/proc/Tech/KAT<br/>NI_2023.pdf</a>     |
| 19 | Mandla                        | Bichhiya<br><br>Mandla             | Not required                               | Not required  | Not required                                                                                            | No Gap<br>identified                           | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Mandla">https://www.mppcb<br/>.mp.gov.in/PdfVie<br/>w.aspx?h=Mandla</a>                                                                                 |

|    |             |             |               |              |                                                                                                |                   |                                                                                                                                                                                                               |
|----|-------------|-------------|---------------|--------------|------------------------------------------------------------------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |             | Nainpur     | Not required  | Not required | Not required                                                                                   | No Gap identified | <a href="#">&amp;pdf=/proc/Tech/MANDLA.pdf</a>                                                                                                                                                                |
|    |             | Niwas       | Not required  | Not required | Not required                                                                                   | No Gap identified |                                                                                                                                                                                                               |
|    |             | Gadarwara   | Not required  | Not required | Not required                                                                                   | No Gap identified |                                                                                                                                                                                                               |
|    |             | Gotegaon    | Not required  | Not required | Not required                                                                                   | No Gap identified | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Narsinghpur&amp;pdf=/proc/Tech/NARSINGHPU_R_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Narsinghpur&amp;pdf=/proc/Tech/NARSINGHPU_R_2023.pdf</a> |
| 20 | Narshingpur | Kareli      | Not required  | Not required | Not required                                                                                   | No Gap identified |                                                                                                                                                                                                               |
|    |             | Narshingpur | Not required  | Not required | Not required                                                                                   | No Gap identified |                                                                                                                                                                                                               |
|    |             | Tendukheda  | Not required  | Not required | Not required                                                                                   | No Gap identified |                                                                                                                                                                                                               |
|    |             | Bareli      | Yes available | Not required | Collected and stored C&D waste is reused for filling of land and PMAY construction activities. | No Gap identified | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Raisen&amp;pdf=/proc/Tech/Raisen_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Raisen&amp;pdf=/proc/Tech/Raisen_2023.pdf</a>                       |
| 21 | Raisen      | Begamganj   | Not available | Not required | Collected and stored C&D waste is reused for filling of                                        | No Gap identified |                                                                                                                                                                                                               |

|    |       |            |                        |                                        |                                                                                                |                   |
|----|-------|------------|------------------------|----------------------------------------|------------------------------------------------------------------------------------------------|-------------------|
|    |       |            |                        | land and PMAY construction activities. |                                                                                                |                   |
|    |       | Gairatganj | Yes available          | Not required                           | Collected and stored C&D waste is reused for filling of land and PMAY construction activities. | No Gap identified |
|    |       | Goharganj  | Not available          | Not available                          | Not available                                                                                  | Not available     |
|    |       | Raisen     | Available              | Not required                           | Collected and stored C&D waste is reused for filling of land and PMAY construction activities. | No Gap identified |
|    |       | Silvani    | Available              | Not required                           | Collected and stored C&D waste is reused for filling of land and PMAY construction activities. | No Gap identified |
|    |       | Udaipura   | Provided at Dump sites | Not required                           | Collected and stored C&D waste is reused for filling of land and PMAY construction activities. | No Gap identified |
| 22 | Sagar | Deori      | available              | Yes available                          | available                                                                                      | No Gap identified |
|    |       | Kesli      | Not available          | Not available                          | Not available                                                                                  | Not available     |

<https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sagar&p>

|    |        |              |                                                                |                                          |                                                                                                |                               |                                                                                                                                                                                         |
|----|--------|--------------|----------------------------------------------------------------|------------------------------------------|------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |        | Ashta        | Available                                                      | Collected and disposed to low lying area | Not required                                                                                   | No Gap identified             |                                                                                                                                                                                         |
|    |        | Budhni       | Not available                                                  | Not available                            | Not available                                                                                  | Not available                 |                                                                                                                                                                                         |
|    |        | Ichawar      | Not available                                                  | Not available                            | Not available                                                                                  | Not available                 |                                                                                                                                                                                         |
| 23 | Sehore | Nasrullaganj | Separate collection point for C&D Waste- Provided at dump site | Not required                             | Collected and stored C&D waste is reused for filling of land and PMAY construction activities. | No Gap identified             | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sehore&amp;pdf=/proc/Tech/SEHORE_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sehore&amp;pdf=/proc/Tech/SEHORE_2023.pdf</a> |
|    |        | Sehore       | Available                                                      | No facility exists                       | Yes                                                                                            | C&D recycling facility needed |                                                                                                                                                                                         |
|    |        | Ghansaur     | Not required                                                   | Not required                             | Not required                                                                                   | No Gap identified             | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Seoni&amp;pdf=/proc/Tech/Seoni_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Seoni&amp;pdf=/proc/Tech/Seoni_2023.pdf</a>     |
| 24 | Seoni  | Lakhnadon    | Not required                                                   | Not required                             | Not required                                                                                   | No Gap identified             |                                                                                                                                                                                         |

|    |            |                                |               |               |                                                                                                           |                   |                                                                                                                                                                                           |
|----|------------|--------------------------------|---------------|---------------|-----------------------------------------------------------------------------------------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 25 | Umaria     | Bandhogarh<br>(Whole District) | Not available | Not available | C&D waste is mostly utilized by the local bodies for facilitating different repair and construction works | No Gap identified | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Umaria&amp;pdf=/proc/Tech/UMARIYA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Umaria&amp;pdf=/proc/Tech/UMARIYA_2023.pdf</a> |
|    |            | Barwah                         | Not required  | Not required  | Not required                                                                                              | No Gap identified |                                                                                                                                                                                           |
|    |            | Bhagwanpura                    | Not available | Not available | Not available                                                                                             | Not available     |                                                                                                                                                                                           |
|    |            | Bhikangaon                     | Not required  | Not required  | Not required                                                                                              | No Gap identified |                                                                                                                                                                                           |
|    |            | Jhirniya                       | Not available | Not available | Not available                                                                                             | Not available     |                                                                                                                                                                                           |
| 26 | West Nimar | Kasrawas                       | Not required  | Not required  | Not required                                                                                              | No Gap identified | <a href="https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Khargone.pdf">https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Khargone.pdf</a>                                                           |
|    |            | Khargone                       | Available     | Yes available | C&D waste is mostly utilized by the local bodies for facilitating different repair and construction works | No Gap identified |                                                                                                                                                                                           |
|    |            | Maheshwar                      | Not required  | Not required  | Not required                                                                                              | No Gap identified |                                                                                                                                                                                           |
|    |            | Seagon                         | Not available | Not available | Not available                                                                                             | Not available     |                                                                                                                                                                                           |

\*Source: MPCB District environment plan

*Table A - 16 Operational STPs details in Narmada Basin, Madhya Pradesh*

| <b><u>S.No.</u></b> | <b>District</b> | <b>ULBs</b>                                 | <b>Existing STP Capacity<br/>(MLD)</b> | <b>Average Capacity<br/>Being Utilized (MLD)</b> | <b>Reuse (MLD)</b> | <b>Operational Status of<br/>STP</b> |
|---------------------|-----------------|---------------------------------------------|----------------------------------------|--------------------------------------------------|--------------------|--------------------------------------|
| 1                   | Anuppur         | Amarkantak                                  | 1.2                                    | 0.365                                            | 0.08               | World Bank, Operational<br>July 2024 |
| 2                   | Burhanpur       | Burhanpur (M<br>Corp.)                      | 3                                      | 2.3                                              | 0                  | Operational                          |
| 3                   | Burhanpur       | Burhanpur (M<br>Corp.)-Boharda              | 21                                     | 14                                               | 5.94               | AMRUT, Operational Mar<br>2021       |
| 4                   | Dewas           | Dewas (M<br>Corp.) - Balawli                | 12                                     | 2.32                                             | 0.7                | Operational                          |
| 5                   | Dewas           | Dewas (M<br>Corp.) - Nanda<br>Nagar, Mendki | 14                                     | 5.44                                             | 1.24               | UDISSMT, Operational<br>Dec 2020     |
| 6                   | Dewas           | Dewas (Saroday<br>Nagar)                    | 12                                     | 12                                               | 0                  | UDISSMT, Operational<br>Oct 2021     |



|    |          |                      |       |       |      |                            |
|----|----------|----------------------|-------|-------|------|----------------------------|
|    |          |                      |       |       |      | World Bank, Operational    |
| 7  | Dhar     | Dharampuri           | 12    | 1.01  | 0.2  | April 2022                 |
| 8  | Dindori  | Dindori              | 3.85  | 1.155 | 0.35 | Vishesh Nidhi              |
|    |          | Jabalpur (M Corp.) - |       |       |      | Unoperational, diverted to |
| 9  | Jabalpur | Kathonda             | 50    | 0     | 0    | 32 MLD STP Kathonda        |
|    |          | Jabalpur (M Corp.) - |       |       |      |                            |
| 10 | Jabalpur | Gwarighat            | 0.55  | 0.24  | 0.1  | Operational                |
|    |          | Jabalpur (M Corp.) - |       |       |      |                            |
| 11 | Jabalpur | Gulatual             | 0.5   | 0.12  | 0.02 | Operational                |
|    |          | Jabalpur (Zone       |       |       |      | AMRUT, Operational Nov     |
| 12 | Jabalpur | II Kathonda)         | 25.51 | 25.51 | 15   | 2022                       |
|    |          | Jabalpur Zone        |       |       |      |                            |
|    |          | three and four at    |       |       |      | AMRUT, Operational Sep     |
| 13 | Jabalpur | Lalpur               | 48    | 34.22 | 27   | 2024                       |

|    |          |                  |      |       |       |                         |
|----|----------|------------------|------|-------|-------|-------------------------|
|    |          |                  |      |       |       | AMRUT, Operational Mar  |
| 14 | Jabalpur | Jabalpur Zone 5  | 29   | 19.88 | 20    | 2024                    |
|    |          | Bhedaghat        |      |       |       | World Bank, Operational |
| 15 | Jabalpur | (Panchwat)       | 0.43 | 0.38  | 0.37  | Dec 2023                |
|    |          | Bhedaghat        |      |       |       | World Bank, Operational |
| 16 | Jabalpur | (Lameta)         | 0.12 | 0.084 | 0.08  | Dec 2023                |
|    |          | Bhedaghat        |      |       |       | World Bank, Operational |
| 17 | Jabalpur | (Gopalpur)       | 0.22 | 0.147 | 0.08  | Dec 2023                |
|    |          | Bhedaghat        |      |       |       | World Bank, Operational |
| 18 | Jabalpur | (Bhopurda)       | 0.06 | 0.043 | 0.014 | Dec 2023                |
|    |          | Bhedaghat        |      |       |       | World Bank, Operational |
| 19 | Jabalpur | (Lametaghat)     | 0.06 | 0.043 | 0.014 | Dec 2023                |
|    |          | Omkareshwar      |      |       |       |                         |
|    |          | (Near            |      |       |       | Vishesh Nidhi,          |
| 20 | Khandwa  | Viradharsham)    | 11.5 | 0.385 | 0.1   | Operational July 2024   |
|    |          | Omkareshwar      |      |       |       |                         |
|    |          | (Trenching       |      |       |       | Vishesh Nidhi,          |
| 21 | Khandwa  | Ground, Village) | 6.45 | 3.1   | 0.9   | Operational Oct 2024    |

|    |             |                               |      |       |      |                                         |
|----|-------------|-------------------------------|------|-------|------|-----------------------------------------|
|    |             | Khargone (M)-                 |      |       |      | AMRUT, Operational                      |
| 22 | Khargone    | Ward No.14                    | 17.6 | 4     | 3.52 | May 2021                                |
| 23 | Mandla      | Mandla                        | 10   | 3.41  | 0.12 | Operational                             |
|    |             | Narsingpur<br>(Dedwara        |      |       |      |                                         |
| 24 | Narsinghpur | Region, Near<br>WTP)          | 6.25 | 1.875 | 0.56 | KFW                                     |
|    |             | Narsingpur                    |      |       |      |                                         |
| 25 | Narsinghpur | (Naktua Region,<br>Near Jail) | 2.75 | 0.825 | 0.25 | KFW                                     |
|    |             | Budhni (Near<br>Dindayal      |      |       |      |                                         |
| 26 | Sehore      | Convent School)               | 2.2  | 1.38  | 1    | Vishesh Nidhi,<br>Operational July 2022 |
|    |             | Budhni (Vill-                 |      |       |      |                                         |
| 27 | Sehore      | Mana)                         | 1.08 | 0.69  | 0.45 | Vishesh Nidhi,<br>Operational July 2022 |
|    |             | Sehore (M) -                  |      |       |      |                                         |
| 28 | Sehore      | Junia Wada                    | 12   | 0.67  | 0.17 | AMRUT, Operational<br>2018              |

Source: Government of Madhya Pradesh. (2024). Action taken report in OA No. 606 of 2018 (Compliance of MSW Management Rules, 2016 and other environmental issues). National Green Tribunal.

*Table A - 17 Under Construction STPs details in Narmada Basin, Madhya Pradesh*

| S. No.   | Name of Location | Capacity of Physical | Status        | Completion | Scheme |                  |        |         |
|----------|------------------|----------------------|---------------|------------|--------|------------------|--------|---------|
| District | ULBs             | Plant (MLD)          | Progress (%)  | Timeline   |        |                  |        |         |
| 1        | Alirajpur        | Jobat (NP)           | Jobat (NP)    | 0.5        | 0      | Work in progress | Mar-26 | SBM 2.0 |
| 2        | Alirajpur        | Alirajpur (M)        | Alirajpur (M) | 3          | 0      | Work in progress | Dec-25 | SBM 2.0 |
| 3        | Balaghat         | Baihar (NP)          | Baihar (NP)   | 1.5        | 0      | Work in progress | Feb-26 | SBM 2.0 |
| 4        | Barwani          | Badwani              | Bheelkhera    | 9          | 92     | Work in progress | Jun-25 |         |
|          |                  |                      | Village       |            |        |                  |        |         |
| 5        | Barwani          | Sendhwa              | Semalia       | 8.5        | 72     | Work in progress | Sep-25 |         |
| 6        | barwani          | Thikari              | Thikari       | 2          | 0      | Work in progress | Feb-26 |         |
| 7        | Barwani          | Palsud (NP)          | Palsud (NP)   | 0.8        | 0      | Work in progress | Jan-26 | SBM 2.0 |
| 8        | Betul            | Shahpur (NP)         | Shahpur (NP)  | 1          | 0      | Work in progress | Mar-26 | SBM 2.0 |
| 9        | Betul            | Bhanishedi           | Bhanishedi    | 0.6        | 0      | Work in progress | Mar-26 | SBM 2.0 |
| 10       | Burhanpur        | Nepanagar            | Nepanagar     | 1          | 0      | Work in progress | Feb-26 | SBM 2.0 |
| 11       | Burhanpur        | Nepanagar            | Nepanagar     | 0.7        | 0      | Work in progress | Feb-26 | SBM 2.0 |

|    |             |                           |                        |      |    |                                                                    |        |                  |
|----|-------------|---------------------------|------------------------|------|----|--------------------------------------------------------------------|--------|------------------|
| 12 | Chhindwara  | Jamai (NP)                | Jamai (NP)             | 3    | 0  | Work in progress                                                   | Feb-26 | SBM 2.0          |
| 13 | Dhar        | Manavar                   | Manavar                | 4.5  | 0  | Work in progress                                                   | Dec-25 | SBM 2.0          |
| 14 | Dhar        | Dhamnod                   | Dhamnod                | 6.68 | 67 | Work in progress                                                   | Sep-26 | ADB              |
| 15 | Hoshangabad | Hoshangabad               | Kishanpur,<br>Rashulia | 21   | 33 | Work in progress                                                   | Dec-25 |                  |
| 16 | Jabalpur    | Panagar (M)               | Panagar (M)            | 3.8  | 0  | Work in progress                                                   | Mar-26 | SBM 2.0          |
| 17 | Jabalpur    | Jabalpur (Civil<br>Lines) | Civil Line             | 5    | 2  | Work in progress                                                   | Jun-25 |                  |
| 18 | Jhabua      | Jhabua                    | Jhabua                 | 5    | 0  | Work in progress                                                   | Dec-25 | SBM 2.0          |
| 19 | Jhabua      | Jhabua                    | Jhabua                 | 3    | 0  | Work in progress                                                   | Aug-26 | AMRUT<br>2.0     |
| 20 | khargone    | Maheshwar                 | Maheshwar              | 4.91 | 48 | Contract<br>Terminated on<br>06.09.2024; rebid<br>for balance work | Dec-25 |                  |
| 21 | Khargone    | Mandleshwar               | Mandleshwar            | 3    | 86 | Work in progress                                                   | Jun-25 | Vishesh<br>Nidhi |

|    |             |                   |                   |      |    |                                                           |        |            |
|----|-------------|-------------------|-------------------|------|----|-----------------------------------------------------------|--------|------------|
| 22 | Khargone    | Sanavad           | Sanavad           | 5.58 | 42 | Work in progress                                          | Jun-25 | ADB        |
| 23 | Khargone    | Kasrawad (NP)     | Kasrawad (NP)     | 2.5  | 0  | Work in progress                                          | Feb-26 | SBM 2.0    |
| 24 | Mandla      | Mandla            | Ward No. 23       | 7.75 | 80 | Work in progress                                          | May-25 |            |
| 25 | Mandla      | Mandla            | Village Gaunjhi   | 1.75 | 80 | Work in progress                                          | Jun-25 |            |
| 26 | Narsinghpur | Gotegaon (NP)     | Gotegaon (NP)     | 1    | 0  | Work in progress                                          | Mar-26 | SBM 2.0    |
| 27 | Raisen      | Obedullaganj (NP) | Obedullaganj (NP) | 2.7  | 0  | Work in progress                                          | Feb-26 | SBM 2.0    |
| 28 | Seoni       | Lakhandon (NP)    | Lakhandon (NP)    | 1    | 0  | Work in progress                                          | Mar-26 | SBM 2.0    |
| 29 | Sehore      | Nasrullaganj      | Ward No.6         | 4.2  | 99 | Contract Terminated on 06.09.2024; rebid for balance work | Jun-25 | World Bank |
| 30 | Sehore      | Ichhawar (NP)     | Ichhawar (NP)     | 1    | 0  | Work in progress                                          | Mar-26 | SBM 2.0    |

\*Source: MPCB District environment plan

*Table A - 18 District-wise Status of Domestic Sewage Status in Narmada Basin, Madhya Pradesh*

| Domestic Sewage Status |                          |                  |                                        |                                              |                                       |                                           |                       |                      |                                                       |                                                                                                                                                                                                   |
|------------------------|--------------------------|------------------|----------------------------------------|----------------------------------------------|---------------------------------------|-------------------------------------------|-----------------------|----------------------|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S.No.                  | Districts                | No of bore wells | Nalas/ Drain s/Cree ks meeti ng Rivers | Quantity of domestic sewage generate d (MLD) | Perce n tage of untreat ed sewage (%) | Quant ity of sewage e flowin g into lakes | No of STPs avail able | No of STPs requi red | No of ULBs have partial undergr ound sewerage network | References                                                                                                                                                                                        |
| 1                      | Alirajpur                | NA               | 225                                    | 8.4                                          | 100                                   | NA                                        | 0                     | 2                    | 1                                                     | <a href="https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Alirajpur.pdf">https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Alirajpur.pdf</a>                                                                 |
| 2                      | Anuppur (Whole District) | 2096             | 3                                      | 20                                           | 100                                   | NIL                                       | 0                     | 10                   | 1                                                     | <a href="https://www.mppcb.mp.gov.in/Pdf/View.aspx?h=Anuppur&amp;pdf=/proc/Tech/DEP%20Anuppur.pdf">https://www.mppcb.mp.gov.in/Pdf/View.aspx?h=Anuppur&amp;pdf=/proc/Tech/DEP%20Anuppur.pdf</a>   |
| 3                      | Balaghat                 | 2991             | 6                                      | 19                                           | 100                                   | 0.1 KLD                                   | 0                     | 8                    | Nil                                                   | <a href="https://www.mppcb.mp.gov.in/Pdf/View.aspx?h=Balaghat&amp;pdf=/proc/Tech/BALAGHAT_2023.pdf">https://www.mppcb.mp.gov.in/Pdf/View.aspx?h=Balaghat&amp;pdf=/proc/Tech/BALAGHAT_2023.pdf</a> |
| 4                      | Barwani                  | 16360            | 23                                     | 12.312                                       | 100                                   | NA                                        | 0                     | 2                    | 1                                                     | <a href="https://www.mppcb.mp.gov.in/Pdf/View.aspx?h=Barwani&amp;pdf=/proc/Tech/Badwani_2023.pdf">https://www.mppcb.mp.gov.in/Pdf/View.aspx?h=Barwani&amp;pdf=/proc/Tech/Badwani_2023.pdf</a>     |

|    |                            |      |     |       |       |     |     |      |    |                                                                                                                                                                                                         |
|----|----------------------------|------|-----|-------|-------|-----|-----|------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5  | Betul (Whole District)     | NA   | 10  | 80    | 100   | NIL | 0   | 7    | 2  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Betul&amp;pdf=/proc/Tech/Betul_23.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Betul&amp;pdf=/proc/Tech/Betul_23.pdf</a>                         |
| 6  | Burhanpur                  | NA   | 55  | 27.76 | 74.78 | 0   | 1   | None | 1  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Burhanpur&amp;pdf=/proc/Tech/BURHANPUR_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Burhanpur&amp;pdf=/proc/Tech/BURHANPUR_2023.pdf</a>     |
| 7  | Chindwara (Whole District) | NA   | 10  | 100   | 50%   | 0   | 0   | 6    | 1  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Chhindwara&amp;pdf=/proc/Tech/CHHINDWARA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Chhindwara&amp;pdf=/proc/Tech/CHHINDWARA_2023.pdf</a> |
| 8  | Damoh                      | NA   | 17  | 136   | -     | Nil | 0   | 6    | 6  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Damoh&amp;pdf=/proc/Tech/Damoh_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Damoh&amp;pdf=/proc/Tech/Damoh_2023.pdf</a>                     |
| 9  | Dewas                      | NA   | 56  | 29    | 83    | Nil | 3   | 1    | 13 | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dewas&amp;pdf=/proc/Tech/DEWAS_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dewas&amp;pdf=/proc/Tech/DEWAS_2023.pdf</a>                     |
| 10 | Dhar                       | NA   | 407 | 47.4  | 98.86 | NIL | 1   | 10   | 1  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dhar&amp;pdf=/proc/Tech/DHAR_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dhar&amp;pdf=/proc/Tech/DHAR_2023.pdf</a>                         |
| 11 | Dindori                    | NA   | 6   | 3.49  | -     | 0   | 0   | 2    | 1  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dindori&amp;pdf=/proc/Tech/DINDORI_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dindori&amp;pdf=/proc/Tech/DINDORI_2023.pdf</a>             |
| 12 | Khandwa                    | 7678 | NIL | 23.64 | 97.25 | NIL | NIL | 1    | 1  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Khandwa%20(East%">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Khandwa%20(East%</a>                                                                   |



|    |              |      |     |       |     |     |     |    |      |                                                                                                                                                                                                               |
|----|--------------|------|-----|-------|-----|-----|-----|----|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |              |      |     |       |     |     |     |    |      | <a href="#">20Nimar)&amp;pdf=/proc/Tech/Khandwa_2023.pdf</a>                                                                                                                                                  |
| 13 | Harda        | 1056 | Nil | 11.8  | 100 | NIL | 0   | 4  | 0    | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Harda&amp;pdf=/proc/Tech/harda_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Harda&amp;pdf=/proc/Tech/harda_2023.pdf</a>                           |
| 14 | Narmadapuram | 5800 | 4   | 35    | 100 | NIL | Nil | 8  | 8    | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Hoshangabad&amp;pdf=/proc/Tech/Narmadapuram_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Hoshangabad&amp;pdf=/proc/Tech/Narmadapuram_2023.pdf</a> |
| 15 | Indore       | NA   | 56  | 475   | 0   | Nil | 11  | 0  | None | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Indore&amp;pdf=/proc/Tech/INDORE_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Indore&amp;pdf=/proc/Tech/INDORE_2023.pdf</a>                       |
| 16 | Jabalpur     | 8832 | 9   | 230   | 60  | NIL | 4   | 18 | 2    | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jabalpur&amp;pdf=/proc/Tech/Jabalpur_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jabalpur&amp;pdf=/proc/Tech/Jabalpur_2023.pdf</a>               |
| 17 | Jhabua       | NA   | 275 | 1.8   | 100 | NIL | 0   | 2  |      | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jhabua&amp;pdf=/proc/Tech/JHABUA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jhabua&amp;pdf=/proc/Tech/JHABUA_2023.pdf</a>                       |
| 18 | Katni        | 1235 | 3   | 20    | NIL | Nil | NIL | 4  | NIL  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Katni&amp;pdf=/proc/Tech/KATNI_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Katni&amp;pdf=/proc/Tech/KATNI_2023.pdf</a>                           |
| 19 | Mandla       | 3180 | 16  | 10.25 | 95  | NIL | 1   | 6  | 1    | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Mandla&amp;pdf=/proc/Tech/MANDLA.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Mandla&amp;pdf=/proc/Tech/MANDLA.pdf</a>                                 |

|    |             |      |    |    |     |       |     |    |     |                                                                                                                                                                                                             |
|----|-------------|------|----|----|-----|-------|-----|----|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 20 | Narshingpur | 4738 | 10 | 30 | 100 | 1 MLD | NIL | 10 | NIL | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Narsinghpur&amp;pdf=/proc/Tech/NARSINGHPUR_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Narsinghpur&amp;pdf=/proc/Tech/NARSINGHPUR_2023.pdf</a> |
|----|-------------|------|----|----|-----|-------|-----|----|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

\*Source: MPCB District environment plan

**Table A - 19 District-wise Status of Industrial Wastewater Status in Narmada Basin, Madhya Pradesh**

| <b>Industrial Wastewater Status</b> |                          |                                                |                                                |                                           |                                             |  | <b>References</b>                                                                                                                                                                               |
|-------------------------------------|--------------------------|------------------------------------------------|------------------------------------------------|-------------------------------------------|---------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>S.No.</b>                        | <b>Districts</b>         | <b>Quantity of industrial wastewater (MLD)</b> | <b>No of Industries discharging wastewater</b> | <b>No of Industries meeting Standards</b> | <b>Common Effluent Treatment Facilities</b> |  |                                                                                                                                                                                                 |
| 1                                   | Alirajpur                | 0                                              | 0                                              | All                                       | NIL                                         |  | <a href="https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Alirajpur.pdf">https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Alirajpur.pdf</a>                                                               |
| 2                                   | Anuppur (Whole District) | 3.9                                            | 346                                            | 346                                       | NIL                                         |  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Anuppur&amp;pdf=/proc/Tech/DEP%20Anuppur.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Anuppur&amp;pdf=/proc/Tech/DEP%20Anuppur.pdf</a>   |
| 3                                   | Balaghat                 | 16                                             | 30                                             | 30                                        | NIL                                         |  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Balaghat&amp;pdf=/proc/Tech/BALAGHAT_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Balaghat&amp;pdf=/proc/Tech/BALAGHAT_2023.pdf</a> |
| 4                                   | Barwani                  | 1                                              | 3                                              | 3                                         | NIL                                         |  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Barwani&amp;pdf=/proc/Tech/Badwani_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Barwani&amp;pdf=/proc/Tech/Badwani_2023.pdf</a>     |

|    |                            |        |     |     |      |                                                                                                                                                                                                                               |
|----|----------------------------|--------|-----|-----|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5  | Betul (Whole District)     | 51.99  | 0   | NA  | NIL  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Betul&amp;pdf=/proc/Tech/Betul_23.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Betul&amp;pdf=/proc/Tech/Betul_23.pdf</a>                                               |
| 6  | Burhanpur                  | 1.07   | 75  | 75  | 1    | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Burhanpur&amp;pdf=/proc/Tech/BURHANPUR_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Burhanpur&amp;pdf=/proc/Tech/BURHANPUR_2023.pdf</a>                           |
| 7  | Chindwara (Whole District) | 46.433 | NIL | 100 | Nil  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Chhindwara&amp;pdf=/proc/Tech/CHHINDWARA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Chhindwara&amp;pdf=/proc/Tech/CHHINDWARA_2023.pdf</a>                       |
| 8  | Damoh                      | 0      | 0   | 11  | None | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Damoh&amp;pdf=/proc/Tech/Damoh_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Damoh&amp;pdf=/proc/Tech/Damoh_2023.pdf</a>                                           |
| 9  | Dewas                      | 4.696  | 0   | 437 | NA   | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dewas&amp;pdf=/proc/Tech/DEWAS_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dewas&amp;pdf=/proc/Tech/DEWAS_2023.pdf</a>                                           |
| 10 | Dhar                       | 18.6   | NIL | NIL | NIL  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dhar&amp;pdf=/proc/Tech/DHAR_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dhar&amp;pdf=/proc/Tech/DHAR_2023.pdf</a>                                               |
| 11 | Dindori                    | 0      | 0   | All | Nil  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dindori&amp;pdf=/proc/Tech/DINDORI_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Dindori&amp;pdf=/proc/Tech/DINDORI_2023.pdf</a>                                   |
| 12 | Khandwa                    | 39.601 | 6   | 6   | NA   | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Khandwa%20(East%20Nimar)&amp;pdf=/proc/Tech/Khandwa_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Khandwa%20(East%20Nimar)&amp;pdf=/proc/Tech/Khandwa_2023.pdf</a> |
| 13 | Harda                      | 110KLD | 0   | 11  | NIL  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Harda&amp;pdf=/proc/Tech/harda_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Harda&amp;pdf=/proc/Tech/harda_2023.pdf</a>                                           |
| 14 | Narmadapuram               | 25     | Nil | NA  | Nil  | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Hoshangabad&amp;pdf=/proc/Tech/Narmadapuram_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Hoshangabad&amp;pdf=/proc/Tech/Narmadapuram_2023.pdf</a>                 |
| 15 | Indore                     | 7.3    | 385 | 385 | 1    | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Indore&amp;pdf=/proc/Tech/INDORE_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Indore&amp;pdf=/proc/Tech/INDORE_2023.pdf</a>                                       |

|    |             |           |     |     |     |                                                                                                                                                                                                             |
|----|-------------|-----------|-----|-----|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 16 | Jabalpur    | 8         | 30  | 30  | NIL | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jabalpur&amp;pdf=/proc/Tech/Jabalpur_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jabalpur&amp;pdf=/proc/Tech/Jabalpur_2023.pdf</a>             |
| 17 | Jhabua      | 720 KLD   | 0   | 0   | 1   | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jhabua&amp;pdf=/proc/Tech/JHABUA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Jhabua&amp;pdf=/proc/Tech/JHABUA_2023.pdf</a>                     |
| 18 | Katni       | 140 KLD   | NIL | 40  | NIL | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Katni&amp;pdf=/proc/Tech/KATNI_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Katni&amp;pdf=/proc/Tech/KATNI_2023.pdf</a>                         |
| 19 | Mandla      | 0.9       | NIL | 10  | NIL | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Mandla&amp;pdf=/proc/Tech/MANDLA.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Mandla&amp;pdf=/proc/Tech/MANDLA.pdf</a>                               |
| 20 | Narshingpur | 1006      | 15  | 15  | NIL | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Narsinghpur&amp;pdf=/proc/Tech/NARSINGHPUR_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Narsinghpur&amp;pdf=/proc/Tech/NARSINGHPUR_2023.pdf</a> |
| 21 | Raisen      | 13.082    | Nil | 381 | Nil | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Raisen&amp;pdf=/proc/Tech/Raisen_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Raisen&amp;pdf=/proc/Tech/Raisen_2023.pdf</a>                     |
| 22 | Sagar       | 15360 KLD | 7   | 7   | NIL | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sagar&amp;pdf=/proc/Tech/Sagar_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sagar&amp;pdf=/proc/Tech/Sagar_2023.pdf</a>                         |
| 23 | Sehore      | 19.2      | 24  | 24  | Nil | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sehore&amp;pdf=/proc/Tech/SEHORE_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Sehore&amp;pdf=/proc/Tech/SEHORE_2023.pdf</a>                     |
| 24 | Seoni       | 10.5      | 7   | 7   | Nil | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Seoni&amp;pdf=/proc/Tech/Seoni_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Seoni&amp;pdf=/proc/Tech/Seoni_2023.pdf</a>                         |
| 25 | Umaria      | 489 KLD   | 0   | 220 | NIL | <a href="https://www.mppcb.mp.gov.in/PdfView.aspx?h=Umaria&amp;pdf=/proc/Tech/UMARIYA_2023.pdf">https://www.mppcb.mp.gov.in/PdfView.aspx?h=Umaria&amp;pdf=/proc/Tech/UMARIYA_2023.pdf</a>                   |
| 26 | West Nimar  | 22.28     | 17  | 17  | Nil | <a href="https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Khangone.pdf">https://www.mppcb.mp.gov.in/proc/Tech/DEP%20Khangone.pdf</a>                                                                             |

\*Source: MPCB District environment plan



