Water Quality Status of Maharashtra

2019-20

Maharashtra Pollution Control Board
महाराष्ट्र प्रदूषण नियंत्रण मंडळ
The Energy & Resources Institute

Water Quality Status of Maharashtra 2019-20

(Compilation of Water Quality Data Recorded by MPCB)

February 2021

Prepared by

The Energy and Resources Institute

...towards global sustainable development

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MAHARASHTRA POLLUTION CONTROL BOARD

Preface

Maharashtra Pollution Control Board is monitoring water quality in Maharashtra to comply with the mandate of Water (Prevention & Control of Pollution) Act, 1974 and to disseminate status of water quality in the State of Maharashtra. Board is monitoring water quality under National Water Monitoring Programme (NWMP) and State Water Monitoring Programme (SWMP) at various locations as per the Uniform Monitoring Protocol of Central Pollution Control Board / MoEF, New Delhi.

This document contains compilation & statistical analysis of Water Quality Monitoring data observed at 294 monitoring stations during the period April 2019 to March 2020. Also National Sanitation Foundation, USA's formula has been used to calculate Water Quality Index (WQI) to depict the water quality in an easy to understand the general public at large. The WQI is also used to compare with the water quality of last few years.

Also presents a comparison for the trend in water quality index for intra-basin analysis for the past thirteen years. Graphical presentation of water quality trend for last 10 years of 294 stations and also riverwise is added in this report. Spatial presentation of water quality indices for the peak summer and post monsoon months is shown for the year 2019-20. Among the basins in 2019-20 year, west flowing rivers recorded majority of the observations in 'Good to Excellent" category followed by Tapi basin and Godavari basin. In 2019-20 "Pranhita & others" sub-basin of Godavari basin has recorded the highest percentage of observations in Good to Excellent category followed by Krishna Upper, West flowing rivers, Wardha & Godavari Upper. Spatial maps have been generated in GIS platform to present the status of water quality at a glance. Also maps showing status of surface and ground water quality are attached. I trust findings of this report will help all concerned departments to prepare suitable action plans for improvement of water quality.

I place a record of gratitude to *Hon'ble Minister for Environment, Shri Aditya Thackeray, Hon'ble Minister of State for Environment, Shri Sanjay Bansode, Hon'ble Principal Secretary (Environment) Govt. of Maharashtra, Ms Manisha Mhaiskar, IAS and Hon'ble Chairman, MPC Board, Shri Sudhir Shrivastava* for having guided through the process.

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Date: February 2021

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Abbreviations

BIS	Bureau of Indian Standards
BOD	Biochemical Oxygen Demand
CAGR	Compound Annual Growth Rate
CGWB	Central Ground Water Board
CPCB	Central Pollution Control Board
CWC	Central Water Commission
DO	Dissolved Oxygen
FC	Fecal Coliform
GIS	Geographical Information System
GSDA	Ground water Surveys & Development Agency
GW	Ground Water
MoEF	Ministry of Environment and Forests
MPCB	Maharashtra Pollution Control Board
NSFWQI	National Sanitation Foundation Water Quality Index
NWMP	National Water Quality Monitoring Program
pH	Power of Hydrogen
RO	Regional Office
SD	Standards Deviation
Shp	Shape files
SPCBs	State Pollution Control Boards
SW	Surface Water
SWMP	State Water Quality Monitoring Program
TDS	Total Dissolved Solids
WHO	World Health Organisation
WQI	Water Quality Index
WQMS	Water Quality Monitoring Stations

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Executive Summary

Water resources whether fresh or marine, not only cater to human needs for water, but are also complex ecosystems that are home to a rich diversity of plants, vertebrates, invertebrates and microbes. They provide numerous ecosystem services like regulating nutrient cycles, carbon sequestration, regulation of microclimate and more. However, the growing population and anthropogenic activities have been exerting immense pressure on these ecosystems. In case of fresh water resources; municipal sewage, agricultural run-off and industrial effluents get discharged into streams, lakes and rivers thereby making these water resources unsuitable for drinking purpose. Since water is a universal solvent, most of the pollutants (chemicals) get dissolved easily which leads to deterioration of the overall water quality. Therefore, it is necessary to conduct regular monitoring of water resources. It not only helps in recording the levels of various pollutants in water bodies but also help policymakers and government bodies to formulate policies and interventions to help conserve these resources, while also minimizing the impacts on human health and environment.

Water quality is assessed by collecting water samples for lab analysis of various physical, chemical and biological parameters or by using probes which can record data such as pH, temperature at a single point in time or logged at regular intervals over an extended period. In India, water quality management is executed under the provisions of the Water (Prevention and Control of pollution) Act, 1974[1]. The main objective of this act is to restore and maintain the quality of all national aquatic resources by prevention and control of pollution. This act empowers the Central Pollution Control Board (CPCB) at the apex level and State Pollution Control Board (SPCB) at the state level as the regulatory authorities to monitor and maintain water quality.

Maharashtra Pollution Control Board (MPCB), being the state nodal agency under CPCB, regularly monitors the water quality across 294 Water Quality Monitoring Stations (WQMS) for both surface water (176 on rivers, 36 on sea/creeks, 12 on drains, 4 dams) and ground water (29 borewells, 35 dug-well, 1 handpump, 1 tubewell) under two programs- National Water Quality Monitoring Program (NWMP) and State Water Quality Monitoring Program (SWMP). MPCB conducts monitoring of surface water samples on a monthly basis while ground water samples are monitored twice a year.

This annual water quality report presents the status of surface and ground water quality in Maharashtra, for the year 2019-20, based on statisticaly analysed data. The status of water quality is depicted in the form of illustrations and spatial representations. The report comprises information of Water Quality Index (WQI) for surface water which includes 5 major basins- Tapi, Godavari, Krishna, and West Flowing, as well as the water samples representing saline (sea/creek) and ground water. The WQI provides a comprehensive value which is indicative of the overall water quality of a particular water body at a particular period after assessing several water quality parameters for that particular water body. The index simplifies the complex parametric data into comprehensive information for easy understanding. It also helps to identify on going and future problems with the water in the region. The WQI in this report has been calculated using the formula developed by National Sanitation Foundation (NSF) and modified by CPCB.

[1]http://mpcb.gov.in/envtdata/QAQC-%20An%20Overview-%20VAM.pdf

Surface Water Quality

Each surface water (SW) sample undergoes testing and analysis for total 43 parameters decided by MPCB. These 43 parameters are divided into 4 sections namely Field observations (6), Core Parameters (9), General Parameters (18), and Trace Metals (10).Out of 43, 4 parameters namely pH, Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD) and Fecal Coliform (FC) gets considered for calculating Water Quality Index (WQI). For its easy interpretation, color codes are assigned which depicts the water quality of that particular SW sample/water body. Assigned color codes and its interpretation (remark) can be shown in Table No. 1

Table No. 1: Classification of Water Quality for Surface Water

Water Quality Index - Surface Water			
WQI	**Quality Classification**	**Remarks**	**Colour Code**
63-100	Good to Excellent	Non-Polluted	
50-63	Medium to Good	Non-Polluted	
38-50	Bad	Polluted	
38 and less	Bad to very Bad	Heavily Polluted	

Source: http://www.mpcb.gov.in/envtdata/Ebulletin_pdf/E_bulletin_Oct2016.pdf

In 2019-20, water quality monitoring was done at about 228 stations which are installed at various waterbodies (rivers, creek, sea and nallahs). In case of river WQMS (Tapi, Godavari, Krishna and West flowing rivers) classification is done based on basin and sub basins (Table No. 2). It is important to note that, 205 WQMS recorded annual average WQI in 'Non-polluted' category (166 WQMS under 'Good to Excellent' and 39 WQMS under 'Medium to Good'). 22 WQMS recorded annual average WQI in 'Polluted' category (15 WQMS under 'Bad' and 7 under 'Bad to Very Bad'). Only 1 WQMS installed at Kadwa River, Nashik district was found to be 'Dry' throughout the monitoring period.

Table No. 2: Annual Average WQI for surface WQMS in various basins and sub basins

Basin	Sub basin	Rivers	G2E	M2G	B	B2V	Dry	Grand Total
Tapi	Tapi Upper	Tapi, Purna, Pedhi	5					5
	Tapi Middle	Tapi, Girna, Rangavali, Amravati, Bori, Burai, Gomai, Hiwara, Kan, Mor, Panzara, Titur, Waghur,	14	1				15
Godavari 1	Godavari Upper	Godavari, Darna	17	2			1	20
	Godavari Middle	Godavari, Bindusara	10	1				11
	Manjra	Godavari, Manjra	2					2
Godavari 2	Wardha	Wardha, Painganga	12					12
	Wainganga	Kolar, Kanhan, Wainganga	11		2	2		15
	Pranhita & Others	Wainganga	1					1
Krishna	Bhima Upper	Bhima, Nira, Chandrabhaga, Mutha, Ghod, Indrayani, Pawana, Sina, Vel, Mula-Mutha	15	11	9	1		36
	Krishna Upper	Krishna, Panchganga, Koyna, Urmodi, Venna	21					21
Coastal	West Flowing Rivers	Kalu, Ulhas, Patalganga, Bhatsa, Vashishti, Mithi, Kundalika, Savitri, Amba, Kundalik, Muchkundi, Surya, Tansa, Vaitarna,	41		1			42
	Sea/Creek		14	22				36
Nallah	Nallah	Rabodi nallah, Colour Chem nallah, Sandoz nalla, BPT Navapur, Tarapur MIDC nallah, Pimpal-Paneri nallah, Chikali Nallah,Nallah at Alkai Mandir,Moti Nallah and Lowki Nallah	3	2	3	4		12
Grand Total			**166**	**39**	**15**	**7**	**1**	**228**

Legend

G2E: Good to Excellent	M2G: Medium to Good	B: Bad	B2V: Bad to Very bad	Dry	No data

As seen in Figure No. 1, In terms of the number of observations falling under the 'Good to Excellent' WQI category, except for 3 sub basins (Godavari Upper, Godavari Middle and Manjra), all other sub basins recorded a marginal increase. In Godavari Upper sub basin, as compared to previous year (2018-19); an increasing trend was observed for observations coming under the category of 'Medium to Good' (19% to 24%) followed by 'Bad'(3.7% to 5.5), 'Bad to very Bad' (0% to 0.4%) and 'Dry' (11% to 13%). In 2019-20, Godavari Middle (17% to 29%) and Manjra (17% to 45%) witnessed sizable increase in observations declared under 'Dry' category as compared to previous year (2018-19). Similar amount of increase in 'Dry' category observations were observed in Wainganga sub basin (1.6% to 12.2%). Sub basins coming under the Godavari basin namely Manjra, Wardha and Pranhita & others did not record any single observation under 'Polluted' remark ('Bad' and 'Bad to Very Bad' WQI category) in 2019-20.

It is important to note that the share of observations recorded as 'Dry' was increased as compared to 2018-19 except at Tapi Middle and Bhima Upper while Pranhita & others sub basin recorded no observation under 'Dry' category.

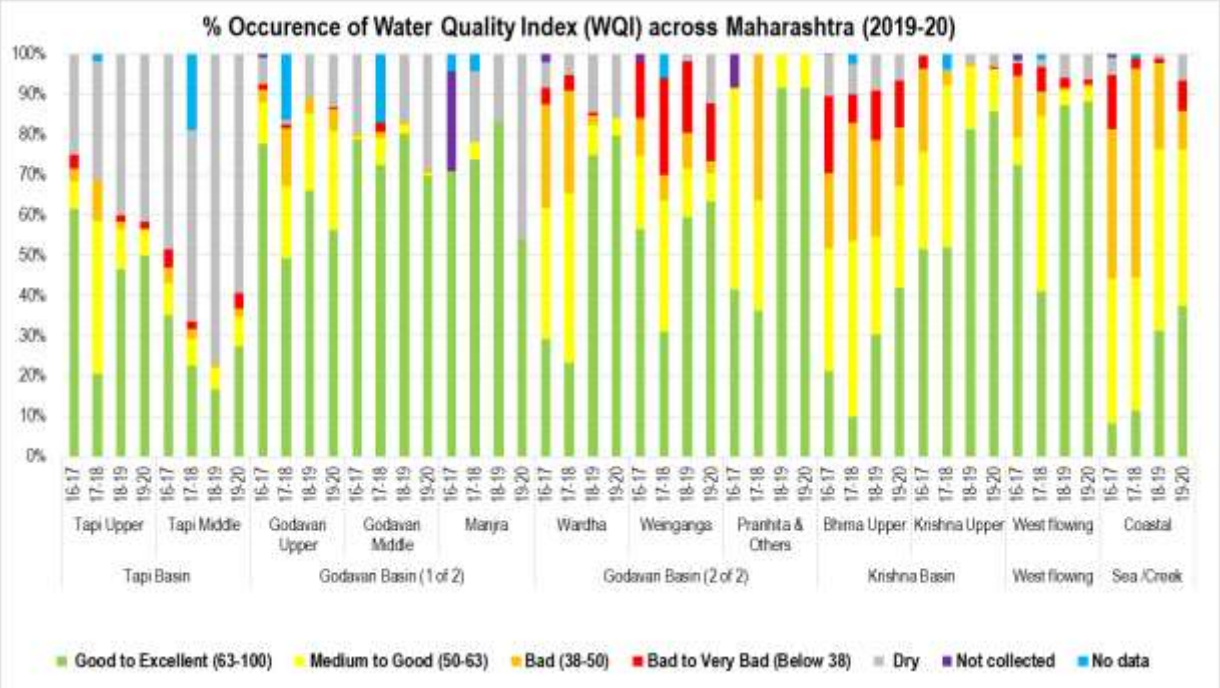
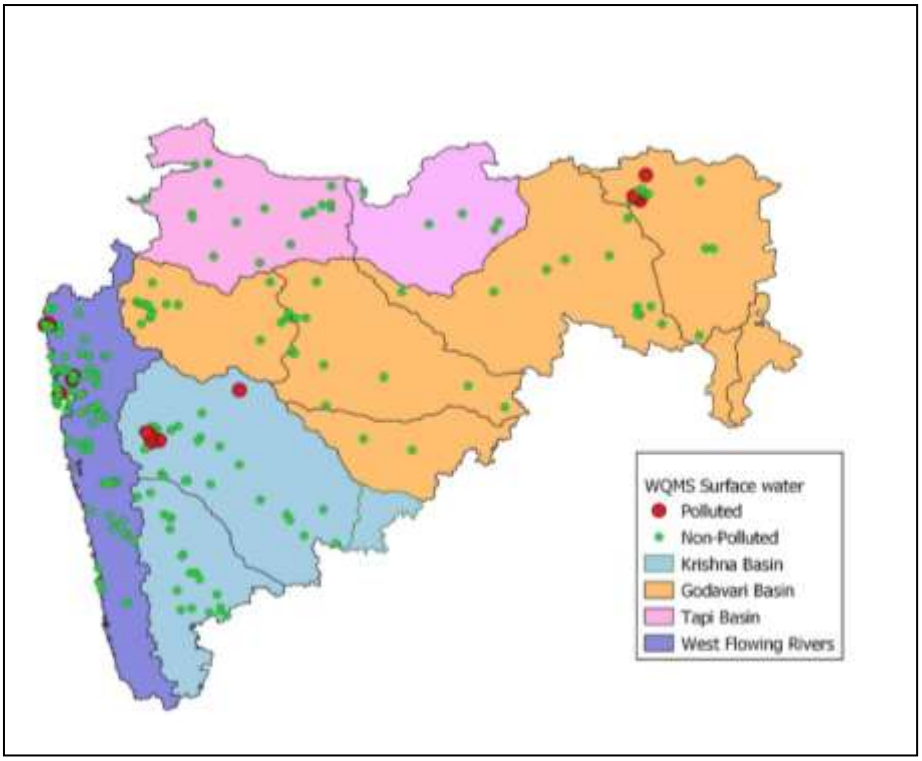


Figure No. 1: Average occurrence of different category of WQI across WQMS in respective sub basins of Maharashtra

Note: *The above comparison is based on the WQI recorded at a monitoring station and the average number of times the WQI was of a certain category at all the WQMS in that basin.*



Map No. 1: Spatial representation of surface WQMS which recorded WQI as polluted for more than 50% of the observations

Map No. 1 highlights spatial representation of the polluted locations which recorded WQI under 'Polluted' category for more than 50% of the observations and the corresponding details of WQMS are mentioned in Table No. 3. The districts of Nagpur, Ahmednagar, Pune, Mumbai, Thane and Palghar have polluted rivers as per the analyzed data.

Table No. 3: WQMS which recorded WQI as polluted for more than 50% observations in 2019-20

Sr No.	Station Code	Station Name	Village	Taluka	District
1	186	Nag River Near, Bhandewadi Bridge, Nagpur	Nagpur	Nagpur	Nagpur
2	187	Nag River Near, Asoli Bridge, Bhandara Road, Nagpur	Nagpur	Nagpur	Nagpur
3	188	Pill River Near, Wanjra Layout Kamptee Road, Nagpur	Nagpur	Nagpur	Nagpur
4	189	Pill River Near, Mankapur on Koradi Road, Nagpur	Nagpur	Nagpur	Nagpur
5	195	Sina River Bridge At Burudgaon Road, A/P Ahmednagar, Taluka & District Ahmednagar	Burudgaon	Ahmednagar	Ahmednagar
6	1190	Bhima river at D/s of Bundgarden, Pune	Yerwada	Haweli	Pune
7	2168	Mithi River at near bridge	Mahim	Bandra	Mumbai

Sr No.	Station Code	Station Name	Village	Taluka	District
8	2191	Mutha River at Sangam Bridge Near Ganpathi Ghat	Shivaji Nagar	Pune	Pune
9	2192	Mula-Mutha River at Mundhwa Bridge	Mundhawa	Haweli	Pune
10	2194	Mula River at Harrison Bridge near Mula - Pawana Sangam	Bopodi	Haweli	Pune
11	2678	Mutha River near Veer Savarkar Bhavan	Pune M.C	Pune	Pune
12	2679	Mutha River at Deccan Bridge, Pune	Deccan	Pune	Pune
13	2690	Pawana River at Kasarwadi Pune	Kasarwadi	Haweli	Pune
14	2691	Pawana River at Dapodi Bridge at Pawana-Mulla Sangan Pune	Dapodi	Haweli	Pune
15	2694	Pawana River at Pimprigaon, Pune	Pimprigaon	Haweli	Pune
16	2782	Rabodi Nalla	Rabodi	Thane	Thane
17	2783	Colour Chem Nalla	Majiwada	Thane	Thane
18	2784	Sandoz Nalla	Sandozbaug	Thane	Thane
19	2785	BPT Navapur	Navapur	Palghar	Palghar
20	2786	Tarapur MIDC Nalla, near sump No 1	MIDC Tarapur	Palghar	Palghar
21	2787	Tarapur MIDC Nalla	MIDC Tarapur	Palghar	Palghar
22	2788	Tarapur MIDC Nalla near sump-III	MIDC Tarapur	Palghar	Palghar

It has been observed that, the samples collected from nallas from Thane and Palghar district have been consistently recording WQI in polluted category. This might be due to the release of industrial effluents from nearby areas and waste from human settlements around the nallas.

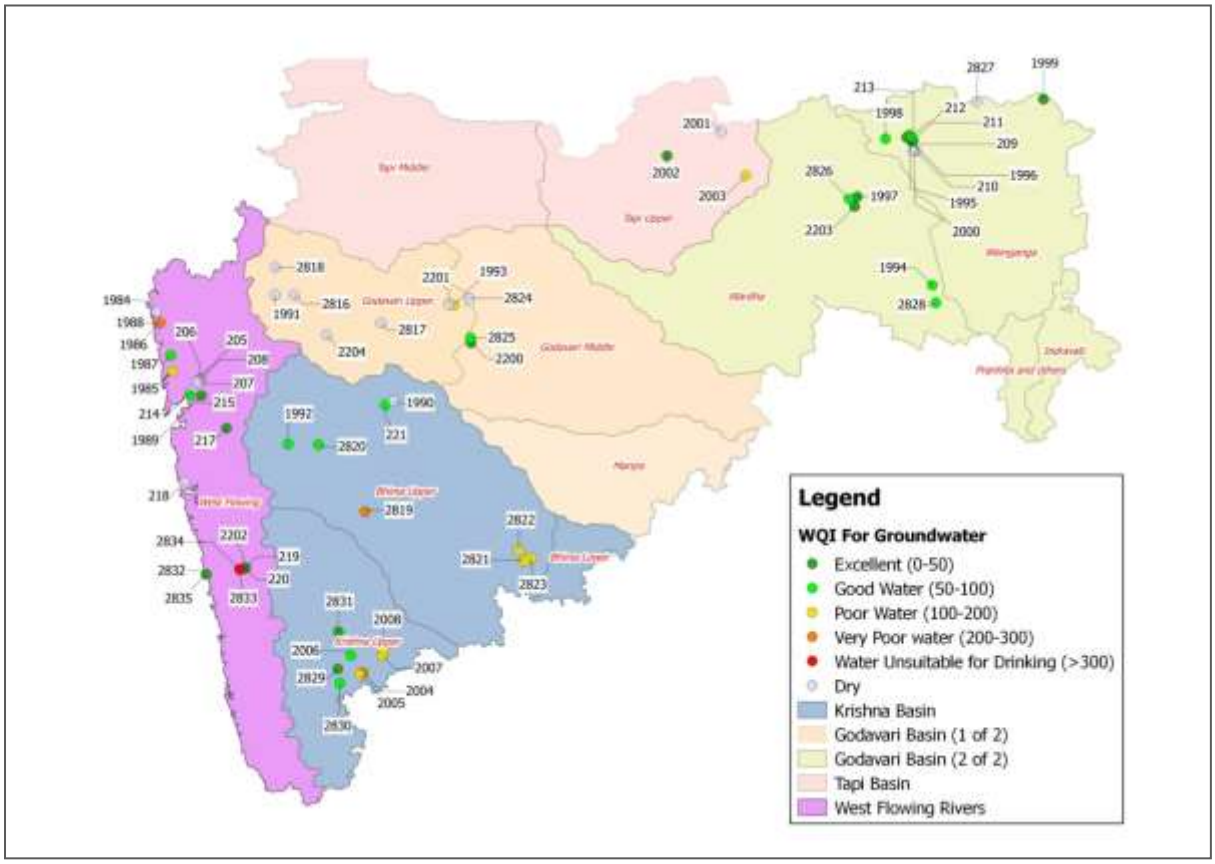
Ground water Quality

For monitoring of Ground water quality, MPCB has installed total 66 WQMS across the Maharshtra state. MPCB checks the pollution level among these stations every after 6 months. 9 parameters namely pH, Total Hardness, Total Dissolved Solids, Calcium, Magnesium, Chloride, Fluoride, Sulphate and Nitrate are taken into consideration for calculating overall WQI. With respect to drinking, CPCB has assigned specific weightage to each of these parameters based on parameter stringency and its relative importance in overall water quality. For easy interpretation, color codes are assigned for each category of WQI. (Table No. 4)

Table No. 4: Classification of Water Quality for Ground water

Water Quality Index – Ground Water			
WQI	**Water Quality**		**Colour Code**
<50	Excellent	Non Polluted	
50-100	Good Water	Non Polluted	
100-200	Poor Water	Polluted	
200-300	Very Poor Water	Polluted	
>300	Water Unsuitable for Drinking	Heavily Polluted	

Source: http://www.mpcb.gov.in/envtdata/Ebulletin_pdf/E_bulletin_English_March2017_13062017.pdf



Map No. 2: Spatial representation for average groundwater WQI

A spatial representation for average WQI recorded by WQMS (groundwater) is depicted in Map No. 2. In the year 2019-20, out of 66 WQMS (for groundwater), 14 WQMS (10 in Kolhapur, 3 in Raigad, and 1 in Pune) recorded average WQI for groundwater under the 'Excellent' category. The total number of WQMS under this category has increased from 5 (2018-19) to 14 (2019-20).

Similar increase was recorded for 'Good Water' category WQI as 25 WQMS (10 in Kolhapur, 7 in Nagpur, 2 in Pune, 2 in Thane and 1 each in Amravati, Aurangabad, Nashik and Navi Mumbai) recorded average WQI under 'Good Water' category. The total number of WQMS under this category has increased from 5 (2018-19) to 25 (2019-20). 20 WQMS (8 in Nagpur,3 in Thane 2 in each Kolhapur,Amravati,Chandrapur,1 each in Nashik,Navi Mumbai and Pune) recorded annual average WQI under 'Poor Water' category while 7 WQMS (3 in Kolhapur,2 in Thane and 1 each in Pune and Aurangabad) recorded annual average WQI under'Very Poor Water'.

3 WQMS recorded recorded WQI under 'Water Unsuitable for Drinking' (Table No. 5).Out of this the WQMS at Ratnagiri district (Dug Well No. 2 Arketwadi) recorded annual average WQI as 684 with high levels of average concentration for parameters such as Total Hardness (2,535 mg/l), Magnesium (1,119 mg/l), Chlorides (1,818 mg/l), and Calcium (1,416 mg/l) and Total Dissolved solids (5,813 mg/l).

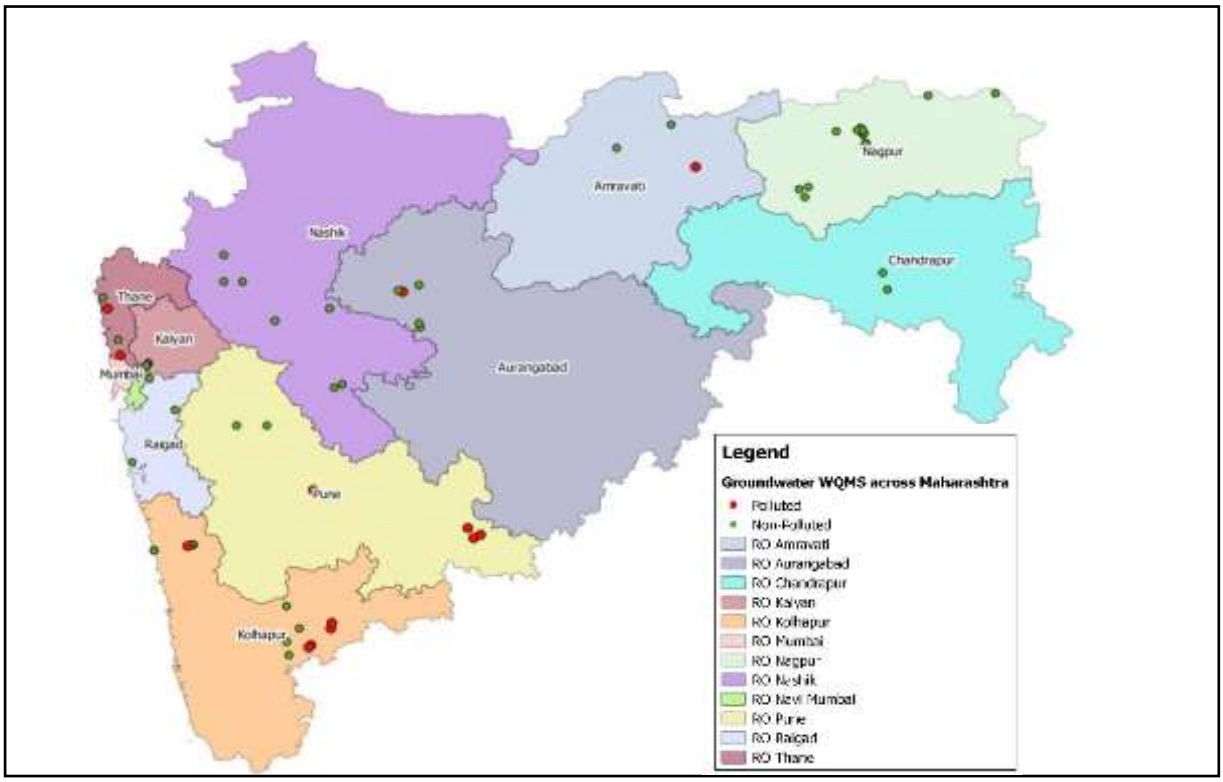
Table No. 5: List of WQMS which recorded annual average WQI in 'Water Unsuitable for Drinking' category

Station ID	Regional Office	Water Body	Station Name	Village	Taluka	District
2834	Kolhapur	Dug Well	Dug Well No.2 at Arketwadi	Arketwadi	Khed	Ratnagiri
2819	Pune	Dug Well	Dug Well Owned by Shri Deshmukh	Malegoan	Baramati	Pune
2004	Kolhapur	Borewell	Bore well at Parvati Industrial Estate, Yadrav, Kolhapur	Yadav	Shirol	Kolhapur

Table No. 6: WQMS which recorded WQI as polluted for more than 50% observations in 2019-20 (Ground Water)

Sr No	Region	Stn code	Station Name	Village	Taluka	District
1	Navi Mumbai	215	Well water at Turbhe Store, Turbhe	Turbhe	Thane	Thane
2	Nashik	221	Well water of Bappaji, Akolner, Ahmadnagar, Nashik	Akolner	Ahmadnagar	Nashik
3	Thane	1985	Dug well at 5 Star Industrial Estate	Kashimira	Mira-Bhayander	Thane
4	Thane	1987	Bore well at Vasai	Gokhiware	Vasai	Thane
5	Thane	1988	Bore well at Gharatwadi, Palghar	Aliyali	Palghar	Thane

Sr No	Region	Stn code	Station Name	Village	Taluka	District
6	Aurangabad	1993	Dug well at Pandarpur, Gangapur, Aurangabad	Pandharpur	Gangapur	Aurangabad
7	Nagpur	1994	Dug well At TPS Durgapur near Naseeb Kirana {} general Store.	Durgapur	Chandrapur	Chandrapur
8	Amravati	2003	Dug well at Plot No- 4, Street No. 49-C, at Nehru Bal Udyan Azad Maidan, owned by Yavatmal M.C.	Nehru Bal Udyan Azad Maidan	Yavatmal	Yavatmal
9	Kolhapur	2004	Bore well at Parvati Industrial Estate, Yadrav, Kolhapur	Yadrav	Shirol	Kolhapur
10	Kolhapur	2005	Bore well at Khanjirenagar, Kolhapur	Khanjirenagar	Hatkananagale	Kolhapur
11	Kolhapur	2007	Bore well at Savali, near Gram Panchayat office.	Savali	Miraj	Sangli
12	Kolhapur	2008	Dug well at Sambarwadi, owned by Shri. Kishan Hali Rajput.	Sambarwadi	Miraj	Sangli
13	Pune	2819	Dug Well Owned by Shri Deshmukh	Malegaon	Baramati	Pune
14	Pune	2821	Bore Well at Bale Railway Station premises Owned by Shri Digambar Joshi	Dahegaon	North Solapur	Solapur
15	Pune	2822	Bore Well near Chincholi	Chincholi	Mohol	Solapur
16	Pune	2823	Bore Well at Shete Vasti near old Tuljapur Road	Shete vasthi, Tuljapur Naka	Solapur	Solapur
17	Aurangabad	2825	Bore Well at Wahegaon, near Zilla Parishet School	Wahegaon	Paithan	Aurangabad
18	Chandrapur	2828	Dug Well near Jilla Parishad Primary School Visapur	Visapur	Ballarpur	Chandrapur
19	Kolhapur	2834	Dug Well No.2 at Arketwadi	Arketwadi	Khed	Ratnagiri



Map No. 3: Spatial representation of ground WQMS which recorded WQI as polluted for more than 50% of the observations

The overall Surface water quality has improved in the year 2019-20, as about 76% (2,080 observations) of the total observations (compared to 71% in 2018-19) recorded by WQMS (Surface Water) were found to be under 'Non-polluted' category (58.9% in 'Good to Excellent' and 17.1% in 'Medium to Good'). The total share of observations under 'Dry' category was found to be around 13.74%.

In case of WQMS (Groundwater), the highest number of WQMS recording 'Excellent' WQI was found to be in Kolhapur region (7) followed by Nagpur region (3) and Raigad (2) while highest number of WQMS recording 'Good water' was found in Nagpur (7), Kolhapur (3) and Pune region (2).The WQMS at Ratnagiri district (Dug Well No. 2 Arketwadi) recorded annual average WQI as 684 followed by WQMS at Pune Region (Dug Well Owned by Shri Deshmukh) with annual average WQI of 318 and WQMS in Kolhapur (Bore well at Parvati Industrial Estate, Yadrav, Kolhapur) with WQI of 312 and indicating 'Water Unsuitable for Drinking' category.

Introduction

Water Pollution

The World Health Organization (WHO), defines water pollution as any change in the physical, chemical and biological properties of water that has negative impacts on living beings. Despite around 70% of the earth's surface being covered with water, water pollution is a global cause of concern due to the limited availability of fresh water on the earth. Degradation of the quality of water from these sources due to pollution will lead to water scarcity, ecosystem degradation and negative impacts on human health. It is estimated that by 2025, about half of the world's population would be living in water-stressed areas[2].

Figure No. 2: Water Pollution Cycle

Image source: https://www.worldbank.org/en/news/infographic/2019/08/20/water-pollution-cycle

Thus, it is extremely important to regularly monitor water pollution and take timely actions to mitigate the same.

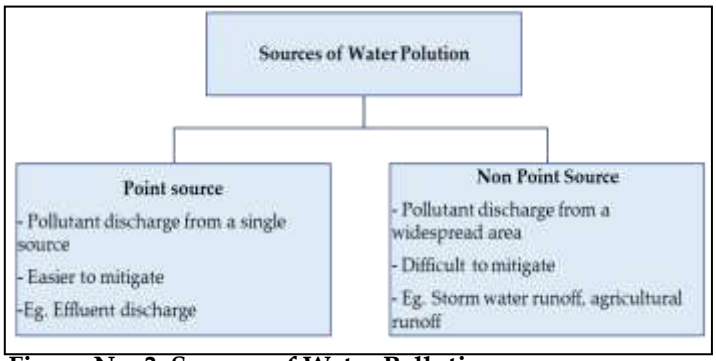


Figure No. 3: Sources of Water Pollution

Globally, at least 785 million people lack even a basic drinking-water service and at least 2 billion people use a drinking water source that is contaminated with faeces[3]. Faecal contamination of water is associated with the occurrence of diseases like diarrhoea, cholera, dysentery, typhoid, and polio, thus posing a threat to public health. Further, pathogenic contamination of water due to microbes like *Shigella sp*, *Cryptosporidium parvum, Giardia lamblia* and others cause Gastroenteritis[4]. Heavy metal contamination in water is mainly due to discharge of effluents from tanneries, electroplating, mining, and other industrial processes. It can have severe health impacts such as retardation of growth and development, kidney damage and cancer[5]. For instance, long-term exposure to Arsenic (As) in drinking-water and food can cause cancer and skin lesions and may increase the risk of cardiovascular diseases and

[2] WHO 2017

[3] https://www.who.int/en/news-room/fact-sheets/detail/drinking-water

[4] Pandey et. al., 2014. Contamination of water resources by pathogenic bacteria.

[5] Paul., 2017. Research on heavy metal pollution of river Ganga: A review

diabetes. In utero and early childhood exposure to Arsenic (As) is known to negatively impact cognitive development and increased deaths in young adults. Apart from health impacts, water pollution also affects the aquatic life. For instance, plastic pollution in water sources is known to result in ingestion of plastic by aquatic species or their death by choking and entanglement[6,7]; Chemical and heavy metal pollution is known to cause reduction of the developmental growth, reduced fish survival, thinning of shells of shellfish and crustaceans, reduced fertility, coral bleaching, and reduced dissolved oxygen levels [8,9,10.] Nutrient pollution from agricultural runoff results in algal blooms. Further, disposal of solid wastes like plastics, metal cans, glass objects and immersion of idols during religious events also pollute water. The contaminants may dissolve in water or remain suspended in the water body. Some of these contaminants may leach down into sediments and groundwater aquifers, causing contamination of groundwater. Also leaching of toxic substances from dumping grounds pollutes groundwater.

Some statistics on water borne diseases in India- According to National Health Profile 2019[11]

- The states of Uttar Pradesh, Delhi, West Bengal, Gujarat and Maharashtra are the top 5 states contributing to the burden of Cholera cases.
- Acute diarrhoeal diseases and Typhoid account for 10.55% and 2.90% of the total deaths due to communicable diseases.
- Acute diarrheal diseases (22%) were the second most common cause of morbidity among the communicable diseases, while Typhoid accounted for 4% morbidity due to communicable diseases.

Thus, given the importance of water in sustaining all life-forms, periodic assessment of water resources is essential. This report assesses the water quality status of the surface and ground water resources of Maharashtra.

Water Pollution Act

In order to prevent and control water pollution and also to maintain or restore water quality, the Ministry of Environment Forests and Climate Change (MoEFCC) enacted the Water Pollution (Prevention and Control) Act, in the year 1974. The act determines the standards for water quality and effluent discharge. It empowers the State and Central Pollution Control Boards to check and control water pollution and improve water quality. Further, the act also mandates that all polluting industries take due permissions from the CPCB/ SPCB to discharge waste into effluent bodies[12]. Later, the Water (Prevention and Control of Pollution)

[6] Wilcox, C., Puckridge, M., Schuyler, Q.A., Townsend, K. and Hardesty, B.D., 2018. A quantitative analysis linking sea turtle mortality and plastic debris ingestion.

[7] Gall and Thompson, 2015. The impact of debris on marine life.

[8] Arenas-Sánchez, et. al., 2016. Effects of water scarcity and chemical pollution in aquatic ecosystems: state of the art.

[9] *Gall and Thompson*. The impact of debris on marine life. 2015

[10] *Islam and Tanaka*. Impacts of pollution on coastal and marine ecosystems including coastal and marine fisheries and approach for management: a review and synthesis. *2004*

[11] http://www.cbhidghs.nic.in/showfile.php?lid=1147

[12] https://tnpcb.gov.in/pdf_2019/WaterAct17519.pdf

Cess Act was enacted in the year 1997. The act was enacted to levy and collect a cess/ tax on water consumed by stakeholders operating and carrying out certain industrial activities.

National Water Quality Monitoring Program

CPCB and SPCB collaborated to establish a network of monitoring stations across the country. Currently, this network comprises of 4,111 stations situated at various water sources (Rivers, Lakes, Tanks, Ponds, Creeks/Sea/Coastal, Canals, Drains, Ground water, Sewage Treatment Plants and Water Treatment Plant for raw water) across the country[13]. Water samples from these sources are analysed for parameters which include 7 field observations, 9 core parameters 19 general physio-chemical and 3 bacteriological parameters, 9 trace metals and 15 pesticides. However, bio monitoring is carried out at specific locations.

[13] http://cpcbenvis.nic.in/water_pollution_main.html#

Water Quality Monitoring in Maharashtra

Located on the west coast of India, Maharashtra is the second state in India in terms of population (11.24 crores)[14] and the third largest in terms of area (30.7Mha).[15]. The state is a hub for various industries, businesses, commercial activities and educational institutions. While this facilitates economic development in the state, the industrial and anthropogenic activities exert pressure on the existing environmental resources. As water is a necessity for all industrial, commercial and anthropogenic activities and often wastes and effluents generated from these activities are discharged into water bodies, there is a need to regularly monitor and mitigate water pollution in the state.

According to the Water Quality Assessment Authority constituted under sub sections (1) and (3) of section 3 of the Environment (Protection) Act, 1986 (Act No.29 of 1986), the agencies responsible for monitoring water quality of various surface and ground water sources are:

- Hydrology Project (SW)
- Ground water Surveys & Development Agency (GSDA)
- Central Pollution Control Board (CPCB)
- Water Commission (CWC)
- Central Ground Water Board (CGWB)

Monitoring network in Maharashtra

Maharashtra is divided into 5 basins-Godavari, Tapi, Narmada, Krishna and West flowing rivers of the Konkan region. Under the NWMP, water quality in Maharashtra is monitored by MPCB, which is the state level nodal agency for monitoring environmental pollution. Monitoring is carried out at 294 station, (176 are on rivers, 36 on sea/creek, 12 on nallahs and 66 ground water), the highest across all states of India (Table No. 7). MPCB has infrastructure to monitor 44 parameters including field observations, general parameters, core parameters and trace metals (Table No. 8). The water samples are monitored with a monthly and six monthly frequencies for surface and ground water stations respectively.

Table No. 7: Basin and water body typewise tally of WQMS in Maharashtra

Type	Water body	Basin				
		Tapi	Godavari	Krishna	West Flowing Rivers	Total
Surface Water	Rivers	20	61	57	40	176
	Dam		2		2	4
	Sea				16	16
	Creek				20	20
	Nalla	2	1	1	8	12
Ground water	Bore well	1	10	10	8	29
	Dug well	1	14	6	13	34

[14] Census 2011
[15] Centre for Technology Alternatives for Rural Areas, Water resources of Maharashtra State

Type	Water body		Basin			
	Hand pump		1			1
	Tube well	1				1
	Well		1			1
Total		**25**	**88**	**74**	**107**	**294**

Table No. 8: List of parameters tested and analyzed by MPCB

Sr No	Field observations	Core parameters	General parameters	Trace metals
1	Weather	Temperature	Turbidity	Cadmium
2	Depth of Water Body	Dissolved Oxygen	Phenophthalein alkalinity	Copper
3	Human activities	pH	Total Alkalinity	Lead
4	Floating Matter (Visible Effluent discharge)	Conductivity	Chlorides	Chromium total
5	Color	BOD	COD	Nickel
6	Odour	Nitrate	Total Kjeldahl-N	Zinc
7		Ammonia-N	Hardness as $CaCO_3$	Iron
8		Fecal Coliform	Calcium $CaCO_3$	Arsenic
9		Total coliform	Magnesium $CaCO_3$	Mercury
10			Sulphate	Pesticides
11			Sodium	
12			Total dissolved solids	
13			Total fixed solids	
14			Total suspended solids	
15			Phosphate	
16			Boron	
17			Potassium	
18			Fluoride	

Methodology

The comprehensive data sets recorded by WQMS across the state were organised basin wise for evaluation for both surface and ground water quality. For each basin, the datasets were further arranged in upstream to downstream order to study basin specific trend of water quality. Table No. 9 depicts the classification of various rivers, their basins and subbasins considered in this report. The Water quality index was calculated by considering the basic water quality parameters like pH, BOD (mg/l), DO (mg/l) and FC (MPN/100ml). The WQI has been calculated separately for surface water and ground water water samples using the formula provided by NSF and the relative weights modified by CPCB. To present the spatial overview of water quality, Geographical Information System (GIS) maps were generated.

Table No. 9: Classification of the rivers considered under basins and sub basins in the report

Basin	Sub basins	Name of rivers	Number of WQM stations
Tapi	Tapi Upper	Tapi, Purna, Pedhi	8
	Tapi Middle	Tapi, Girna, Rangavali, Amravati, Bori, Burai, Gomai, Hiwara, Kan, Mor, Panzara, Titur, Waghur, Waghur	17
Godavari 1	Godavari Upper	Godavari, Chikhali nalla, Darna	28
	Godavari Middle	Godavari, Bindusara	14
	Manjra	Godavari, Manjra	2
Godavari 2	Wardha	Wardha, Penganga	17
	Wainganga	Kolar, Kanhan, Wainganga	26
	Pranhita and others	Wainganga	1
Krishna	Bhima Upper	Bhima, Nira, Chandrabhaga, Mutha, Ghod, Indrayani, Pawana, Sina, Vel, Nalla, Mula-Mutha	45
	Krishna Upper	Krishna, Panchganga, Koyna, Urmodi, Venna	29
West Flowing rivers		Kalu, Ulhas, Patalganga, Bhatsa, Vashishti, Mithi, Kundalika, Savitri, Amba, Kundalik, Muchkundi, Surya, Tansa, Vaitarna	59
		Rabodi nalla, Colour Chem nalla, Sandoz nalla, BPT Navapur, Tarapur MIDC nalla, Pimpal-Paneri nalla	12
Saline			36
Total			**294**

Spatial Maps

Sub -basin level maps

Among the 5 major river basins, Narmada basin comprises of just 0.5%[16] of the total area. Hence, the WQMS under this basin were included in the Tapi basin for ease and convenience. The remaining WQMS were divided into the four basins. Since the basins are huge and have many WQMS within them, the sub basin level map was generated in accordance with the data and demarcation published by CGWB, Ministry of Water Resources Government of India[17]. The images, for the basins of Tapi, Krishna and Godavari, were downloaded and the maps were digitized after geo-referencing them to generate shape (.shp) files

MPCB Regional Office (RO) maps

Maps depicting the jurisdiction of the regional offices of MPCB, were superimposed with district boundaries to generate RO Maps. The peak season water quality index for the stations in each RO have been compiled in this report for the necessary action by the respective RO's of MPCB.

Organizing and presentation of the data sets

The data sets for water quality parameters (temperature, dissolved oxygen, pH, conductivity, BOD, COD, Fecal Coliform (FC) and others) for the years 2008 to 2020, were received from MPCB in soft copy. These data sets were organised in spread sheets for further analysis and illustrative presentation. Stock graphs were generated to depict the minimum, maximum, 25th and 75th percentile values along with the mean values observed for parameters- pH, BOD, DO and FC. The standard deviation (SD) values were calculated and have been presented along with the data sets in the spread sheets

Water Quality Index

A water quality index is a single, comprehensive value that expresses overall water quality of a certain water sample (location and time specific), based on multiple water quality parameters. The objective of developing an index is to simplify the complex water quality parametric data into comprehensive information that is easy to interpret not only for policy makers and scientists, but also for a layman. Assessment of water quality index thus serves as a simple indicator of water quality and provides an overview of the possible problems with the water quality in the region.

In 1970, the National Sanitation Foundation, USA developed the Water Quality Index (NSFWQI), a standardized method for comparing the water quality of various water bodies[18]. NSFWQI is one of the most widely used water quality index in the United States. Nine water quality parameters selected for calculating the index included

[16] Maharashtra Water Resources Regulatory Authority, http://www.mwrra.org/introduction.php?link=wr

[17] Central Ground Water Board, http://cgwb.gov.in/watershed/list-ws.html

[18] http://bcn.boulder.co.us/basin/watershed/wqi_nsf.html

- Dissolved Oxygen (DO)
- Faecal Coliform (FC)
- pH
- Biochemical Oxygen Demand (BOD) (5-day)
- Temperature change (from 1 mile upstream)
- Total phosphate
- Nitrate
- Turbidity
- Total Solids

The expression for calculation the NSFWQI is expressed as;

$$\text{NSFWQI} = \sum_{i=1}^{p} \text{WiIi}$$

Where;

Ii= sub index for i^{th} water quality parameter

Wi= weight (in terms of importance) associated with water quality parameter

P= number of water quality parameters

WQI for surface water

To calculate WQI in the Indian context, the NSF WQI has been modified and relative weights been assigned by CPCB. This ensures uniformity in the WQI assessment across the country, based on the parameters monitored in India under the NWMP. The modified weights as per CPCB are presented in Table No. 10 and the equations used to determine the sub index values are indicated in Table No. 11. Upon determining the Water Quality Index, the water quality is described for easy interpretation. The description used in the report for classifying and the describing the water quality is presented in Table No. 12.

Table No. 10: Modified weights for computation of WQI based on DO, FC, pH and BOD

Parameters	Original Weights from NSF WQI	Modified Weights by CPCB
Dissolved Oxygen (DO)	0.17	0.31
Fecal Coliform (FC)	0.15	0.28
pH	0.12	0.22
BOD	0.1	0.19
Total	0.54	1

Table No. 11: Sub index equation used to calculate NSF WQI for DO, FC, pH and BOD

Water Quality Parameters (units)	Range Applicable	Equation
Dissolved Oxygen (DO)(% Saturation)	0-40	0.18 + 0.66 X % Saturation DO
	40-100	(-13.55) + 1.17 X % Saturation DO
	100-140	163.34 - 0.62 X % Saturation DO
Fecal Coliform (FC) (counts/100 ml)	1 - 10^3	97.2 - 26.6 X log FC
	10^3 - 10^5	42.33 - 7.75 X log FC
	>10^5	2
pH	02 - 05	16.1 + 7.35 X (pH)
	05 - 7.3	(-142.67) + 33.5 X (pH)
	7.3 - 10	316.96 - 29.85 X (pH)
	10 – 12	96.17 - 8.0 X (pH)
	<2, >12	0
BOD (mg/l)	0 – 10	96.67 - 7 X (BOD)
	10 – 30	38.9 - 1.23 X (BOD
	>30	2

Table No. 12: Water Quality Classification and Best Designated use

WQI	Quality classification	Class by CPCB	Class by MPCB	Remarks	Colour code
63 - 100	Good to Excellent	A	A-I	Non Polluted	
50 - 63	Medium to Good	B	Not Prescribed	Non Polluted	
38 - 50	Bad	C	A-II	Polluted	
38 and less	Bad to Very Bad	D, E	A-III, A-IV	Heavily Polluted	

Sample calculation for determining Surface WQI

Parameters considered in the year 2019-2020 Biological Oxygen Demand (BOD), Dissolved Oxygen (DO), pH, Fecal Coliform (FC)

Station Name	:	Godavari River at Jaikwadi Dam, Paithan			
Station Code	:	1312			
Sub basin	:	Godavari Middle	Basin	:	Godavari
BOD	:	3.6 mg/l	DO	:	7.0 mg/l
FC	:	2.0 MPN/100 ml	pH	:	8.01

Formula

$$\text{NSFWQI} = \sum_{i=1}^{p} \text{WiIi}$$

Where;

Ii= sub index for water quality parameter

Wi= weight (in terms of importance) associated with water quality parameter

P= number of water quality parameters

Sub index for BOD

BOD value = 3.6 mg/l

Since 3.6 lies in range (0-10), the corresponding formula is used Table No.12

Sub Index (BOD) = 96.67 – 7 X (BOD value)

= 96.67 – 7 X 3.6

= 71.47 X Modified Weights by CPCB for BOD (Table No.11)

= 71.47 X 0.19

= 13.57

Sub index for Dissolved Oxygen (DO)

DO value = 7.0 mg/l

DO (saturation %) = 7.0 /6.5 X 100 [6.5 has been taken as constant as per DO vs temp]

= 107

Since 107 lies in range (100-140), the corresponding formula is used from Table No.12

Sub Index (DO) = 163.34 - 0.62 X % Saturation DO

= 163.34 - 0.62 X % Saturation DO

= 97 X Modified Weights by CPCB for DO (Table No.11)

= 97* 0.31

= 30

Sub index for Fecal Coliform (FC)

Fecal Coliform value = 2.0 MPN/100ml

Since 2.0 lies in range (0-10^3), the corresponding formula is used from Table No.12

Sub Index (FC) = 97.2 - 26.6 X log FC

= 97.2-26.6 X log 2

= 89 X Modified Weights by CPCB for FC (Table No.11)

= 89 X 0.28

= 25

Sub Index for pH

pH value = 8.01

Since 8.01 lies in range (7.3-10), the corresponding formula is used from Table No.12

Sub Index (pH) = 316.96 - 29.85 X (pH)

= 316.96-29.85 X 8.01

= 78 X Modified Weights by CPCB for pH (Table No.11)

= 78 X 0.22

= 17

WQI of Godavari River at Jaikwadi Dam, Paithan

WQI = ∑ (sub –index of all parameters)

= ∑ (13.57+30+25+17)

= 86

Quality Classification: Good to Excellent

WQI for ground water

MPCB monitors ground water quality by asesseing the status of parameters like pH, total hardness, Calcium, Magnesium, Chloride, Total Dissolved Solids (TDS), Fluoride, Manganese, Nitrate, Sulphates and so on once in six months. To determine the WQI for ground water, these parameters are assigned specific weights based on the stringency of the parameters and its relative importance in the overall quality of water for drinking purposes[19]. The relative weights of the same have been determined (Table No. 13) for the parameters monitored and recorded by MPCB for the water samples monitored in the year 2019-20.These weights indicate the relative harmfulness when present in water. The maximum weight assigned is 5 and minimum is 1.

Table No. 13: Relative Weight of chemical parameters used for calculating WQI for Ground water

Chemical Parameters	Indian Standards for Drinking Water Quality[20]		Weight (Wi)			
	Acceptable Limit	Permissible Limits	Weight	Relative Weight	Weight w/o Iron, Manganese and Bicarbonate	Relative Weight w/o Iron, Manganese and Bicarbonate
pH	6.5-8.5	No relaxation	4	0.09756	4	0.13333
Total Hardness (TH)	300	600	2	0.04878	2	0.06667
Calcium	75	200	2	0.04878	2	0.06667
Magnesium	30	No relaxation	2	0.04878	2	0.06667
Bicarbonate	244	732	3	0.07317	-	-
Chloride	250	1000	3	0.07317	3	0.10000
Total Dissolved Solids (TDS)	500	2000	4	0.09756	4	0.13333
Fluoride	1	1.5	4	0.09756	4	0.13333
Manganese	0.1	0.3	4	0.09756	-	-
Nitrate	45	No relaxation	5	0.12195	5	0.16667
Iron	0.3	No relaxation	4	0.09756	-	-
Sulphate	200	400	4	0.09756	4	0.13333
			41	1	30	1

Source: BIS 10500 and CPCB 2001

[19] C. R. Ramakrishnaiah, Assessment of Water Quality Index for the Groundwater , E-Journal of Chemistry, 2009, 6(2), 523-530; ISSN: 0973-4945

[20] Bureau of Indian Standards, *Draft Indian Standard Drinking Water – Specification*; Second Revision of IS 10500, ICS No. 13.060.20

The relative weight is then computed from the following equation

$$Wi = \frac{wi}{\sum_{i=1}^{n} wi}$$

Where;

Wi = the relative weight

wi = the weight of each parameter

n = number of parameters

In the next step a quality rating scale (qi) for each parameter is assigned by dividing its concentration in each water sample by its respective standard according to the guidelines published by Bureau of Indian Standards (BIS) and the result thus obtained is multiplied by 100.

$$qi = (Ci/Si) \times 100$$

Where;

Qi = quality rating

Ci = the concentration of each chemical parameter in each water sample in mg/L

Si = the Indian drinking water standard for each chemical parameter in mg/L according to the guidelines of the BIS 10500, (2004-2005).

Based on the absolute value of the index determined from the calculations, water quality is classified as presented below in Table No. 14.

Table No. 14: Ground water classification based on the Water Quality Index

WQI Value	Water Quality	Colour code used in this report
<50	Excellent	
50-100	Good water	
100-200	Poor Water	
200-300	Very Very Poor water	
>300	Water Unsuitable for drinking	

Sample Calculation for determining Ground WQI

Station name : Bore well at Khanjirenagar, Village-Khanjirenagar, Taluka-Hatkanangale, District-Kolhapur

Station code	: 2005	Sub basin	: Krishna Upper	Basin	: Krishna
Calcium	: 190 mg/l	Chlorides	: 171 mg/l	Fluoride: 0.98	
Magnesium	: 182 mg/l	Nitrate	: 0.86 mg/l	Sulphate: 125 mg/l	
pH	: 7.8	TDS	: 968 mg/l	TH	: 372 mg/l

Formula

$$WQI = \sum_{i=1}^{n=9} qi.wi$$

Where;

Wi = relative weight

qi = quality rating

wi = relative of each weight

$$qi = (Ci/Si) \times 100$$

Where;

Ci = the concentration of each chemical parameter in each water sample in mg/l

Si = the Indian drinking water standard for each chemical parameter in mg/l according to the guidelines of the BIS 10500, (2004-2005)

Parameters considered for ground water monitoring: pH, Total hardness, Calcium, Magnesium, Chloride, Total Dissolved Solids, Fluoride and Sulphate.

*The relative weight (wi) without iron, manganese and Bicarbonate has been considered in calculation.

Sub Index for pH

pH = 7.8

Sub index (pH) = Concentration /Standard X 100

= 7.8/7.5 X 100

= 104 X relative weight (Table no. 14)

= 104 X 0.13333

= 13.86

Sub index for Total hardness

Total hardness = 372

Sub index (TH) = Concentration /Standard X 100

= 372/ 300*100

= 124 X relative weight (Table no. 14)

= 124 X 0.06667

= 8.26

Sub index Calcium

Calcium = 190

Sub index (Calcium) = Concentration /Standard *100

= 190/ 75 X 100

= 253.3 X relative weight (Table no. 13)

= 25.3X 0.0666

= 16.88

Sub index for Chloride

Chloride = 171

Sub index (Chloride) = Concentration /Standard X 100

= 171/ 250 X 100

= 68.4 X relative weight (Table no. 14)

= 68.4 X 0.1

= 6.84

Sub index for Fluoride

Fluoride = 0.98

Sub index (Fluoride) = Concentration /Standard X 100

= 0.98/ 1 X 100

= 0.98X relative weight (Table no. 13)

= 0.98 X 0.1333

= 13.06

Sub index for Magnesium

Magnesium = 182

Sub index (Mg) = Concentration/ Standard X 100

= 182/ 30*100

= 606.66 X relative weight (Table no. 14)

= 606.66 X 0.06667

= 40.44

Sub index for Nitrate

Nitrate = 0.86

Sub index (Nitrate) = Concentration/ Standard X 100

= 0.86/45 *100

= 1.91 X relative weight (Table no. 14)

= 1.91 X 0.16667

= 0.31

Sub index for Sulphate

Sulphate = 125

Sub index (Sulphate) = Concentration/ Standard X 100

= 125/ 200 X 100

= 62.5 X relative weight (Table no. 13)

= 62.5 X 0.13333

= 8.33

Total Dissolved Solids

Total Dissolved Solids= 968

Sub index (TDS) = Concentration/ Standard X 100

= 968/ 500 X 100

= 193.6 X relative weight (Table no. 14)

= 193.6 X 0.13333

= 25.81

WQI of Bore well at Khanjirenagar, Village-Khanjirenagar, Taluka-Hatkanangale, District- Kolhapur

WQI = ∑ (sub –index of all parameters)

= ∑ (13.86 + 8.26 + 16.88+ 6.84 + 13.06+ 40.44 + 0.31+ 8.33+ 25.81)

= 133.79

Quality Classification: Poor Water

CAGR: Compound Annual Growth Rate

Compound Annual Growth Rate= ((End value/Start value) ^ (1/Number of intervals))- 1

Number of intervals = (Number of observations)-1 *100

Sample Calculation for determining CAGR

Example Station code: 2809
WQI of 2019-2020 (End value): 55; WQI of 2007-08 (Start value) 41; Number of intervals 13

CAGR % = ((End value/Start Value) ^1/Number of intervals)) - 1 X 100

= ((55/41) ^ (1/13)-1 *100

= 2.26% = Quality Improved

Surface Water Quality

Surface water is an important natural resource which includes both saltwater from seas/ oceans and fresh water available in rivers, lakes, reservoirs and streams. Surface water is more accessible as compared to ground water thereby gets used in various applications. Freshwater gets utilized for many purposes including irrigation, daily water supply (for drinking water and everyday use) and industrial activities. Surface water plays a key role in hydrological cycle in which it gets continuously replenished by precipitation and depletes through discharge to the oceans, evaporation and groundwater recharge. Along with fulfilling a major portion of daily needs of humans; these resources also provides habitat for numerous plant and animal species thereby support an entire ecosystem.

In India, Monsoon is main source of surface water. It not only helps in filling surface water resources such as rivers, dams, reservoirs but also helps in recharging groundwater levels. It is estimated that out of 1869 billion cubic meters (bcm) which is an average water resources potential, only about 690 bcm surface water resources are actually been utilized in India[21].Currently, such resources are facing immense pressure due to anthropogenic activities such as urbanization and industrialization. These resources are prime receivers of industrial and municipal effluents/sewage which creates water pollution and degrades overall water quality of such resources. It is also deleterious to aquatic ecosystem and its components. Residues of heavy metals and pesticides present in industrial effeluents may get bioaccumulated in aquatic organisms such as Fish and other crustaceans. Consumption of such organisms may affect humans (through a medium of food chain) which may have possible harmful effects on humans as well. Thus it becomes mandatory to continuously track the level of pollutants in water bodies.

For this purpose, MPCB has installed WQMS across the Maharashtra state to monitor the overall water quality of a particular surface water resource. The total WQMS for year 2019-20 are represented in the Table No. 15. Water quality is monitored per month across all the stations. The spatial presence of the stations is presented basin wise in the respective sections.

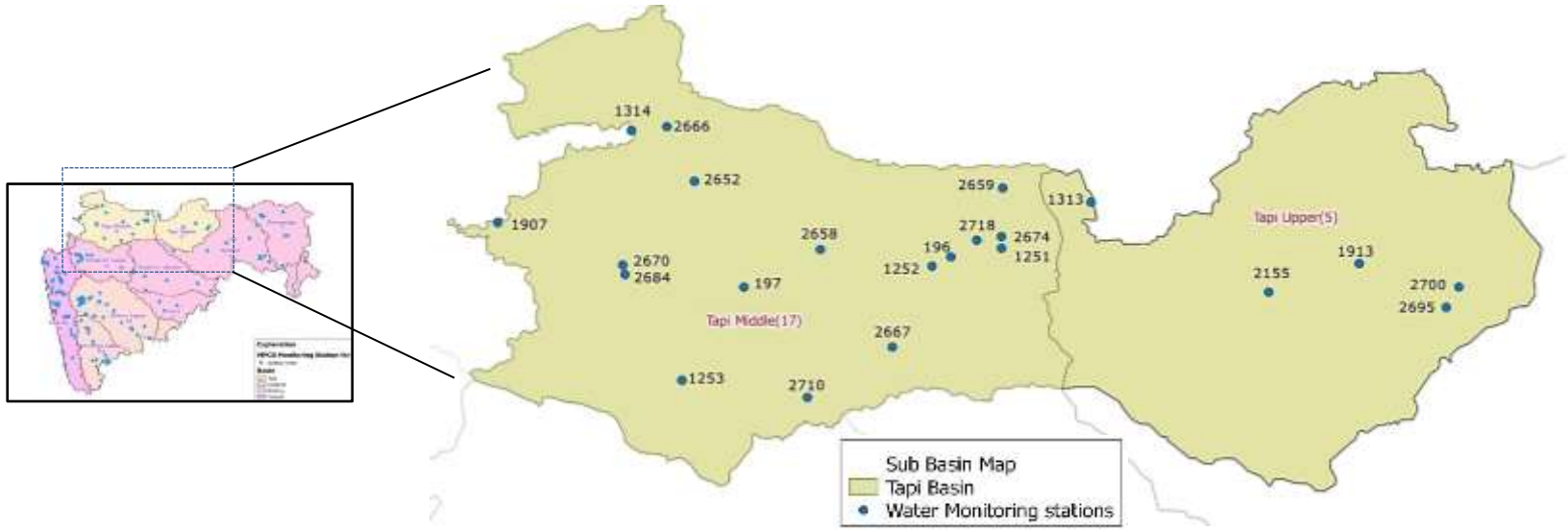
Table No. 15: **List of monitoring stations across different type of water bodies under MPCB**

Water Quality Monitoring Stations	
Water Bodies	**2019-20**
Rivers	176
Sea and Creek	36
Nalla	12
Dams	4
Total	**228**

The following section presents the intra as well as inter basin performance and WQI of major river basins (Tapi, Godavari, Krishna and West flowing rivers) and coastal basin (Sea/Creek). Further, it also represents level of parameters (pH, DO, BOD and FC) in graphical format recorded by all 228 surface WQMS of MPCB.

[21] https://www.adriindia.org/adri/india_water_facts

Tapi Basin

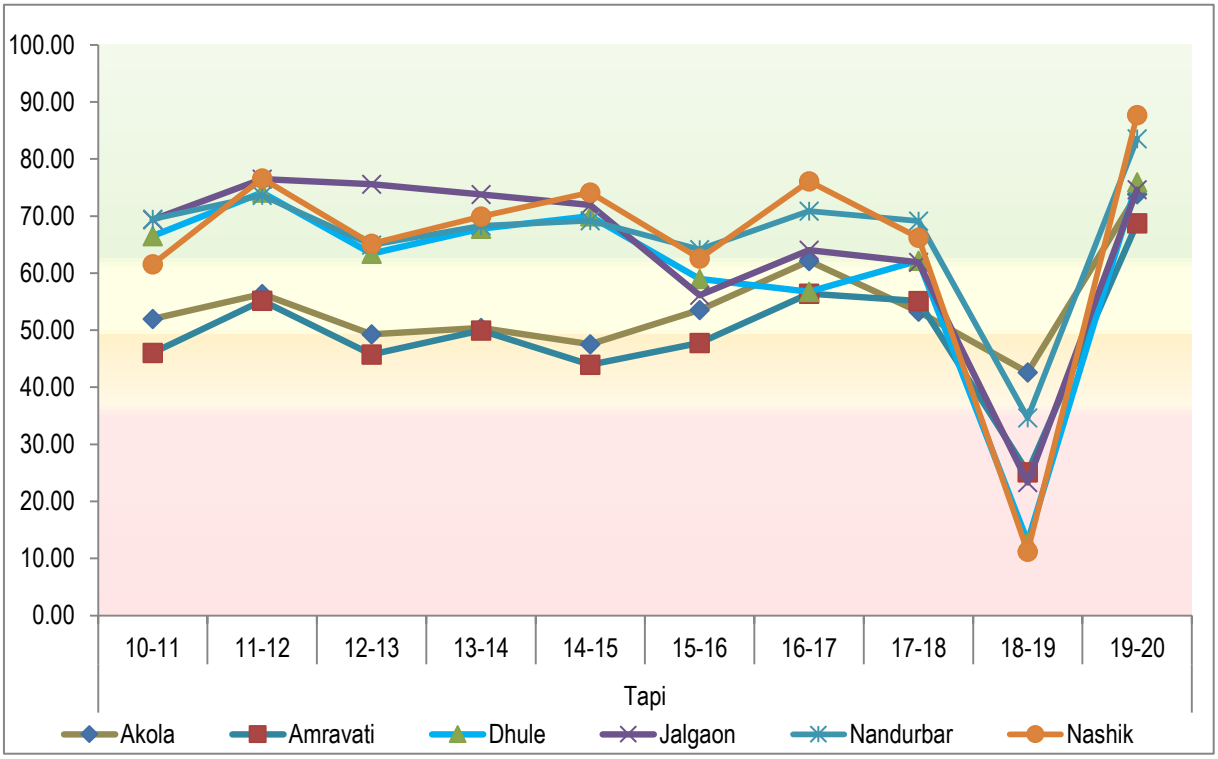


Map No. 4: Network of surface water quality monitoring stations in Tapi basin

With a length of around 724 km; it is of the major rivers of peninsular India. It is one of the only 3 rivers in peninsular India that run from east to west. Drinage areaof this river is spanned over 65145 sq.km; out of which around 80% area lies in the state of Maharashtra followed by 15% in Madhya Pradesh and nearly 6% in Gujarat. There are 14 major tributaries which include Rivers like the Vaki, the Gomai, the Arunavati, the Aner, the Nesu, the Buray, the Panjhra, the Bori, the Girna, the Vaghur, the Purna, the Mona and the Sipna[22]. A list of the station and the codes has been provided below in. Table No. 16

[22] http://india-wris.nrsc.gov.in/wrpinfo/index.php?title=Tapi

Tapi Basin (Intra and Inter Basin analysis)



WQI	Category	Class by CPCB	Remarks
63-100	Good to Excellent	A	Non polluted
50-63	Medium to Good	B	Non polluted
38-50	Bad	C	Polluted
38 & less	Bad to Very Bad	D, E	Heavily polluted

Figure No. 4: **Trend of annual average WQI across districts of Tapi basin**

Note: This graph considers the average WQI for all the monitoring stations in that particular district and hence may include some bias. This graph is only for an overview and monitoring station wise data maybe analyzed to pin point the most affected and polluted patches of rivers in that district.

Figure No. 4 depicts the intra basin performance of Tapi basin across six districts of the state. It is worth mentioning that in 2019-20, the WQI was observed to be improved significantly as compared to previous year (2018-19) with annual average WQI being recorded at all districts to be under 'Good to Excellent' category. It is important to note that in previous year (2018-19), the annual average WQI at all 6 districts were found to either in 'Bad' or 'Bad to Very Bad' category. Highest WQI was recorded at Nashik (87.7) followed by Nandurbar (83.5), Dhule (75.9), Jalgaon (74.6), Akola (73.8) and Amaravati (68.7) It indicates significant improvement in water quality in Tapi basin across all six districts.

Note: Around 42% of the observations in Tapi basin were recorded under 'Dry' category

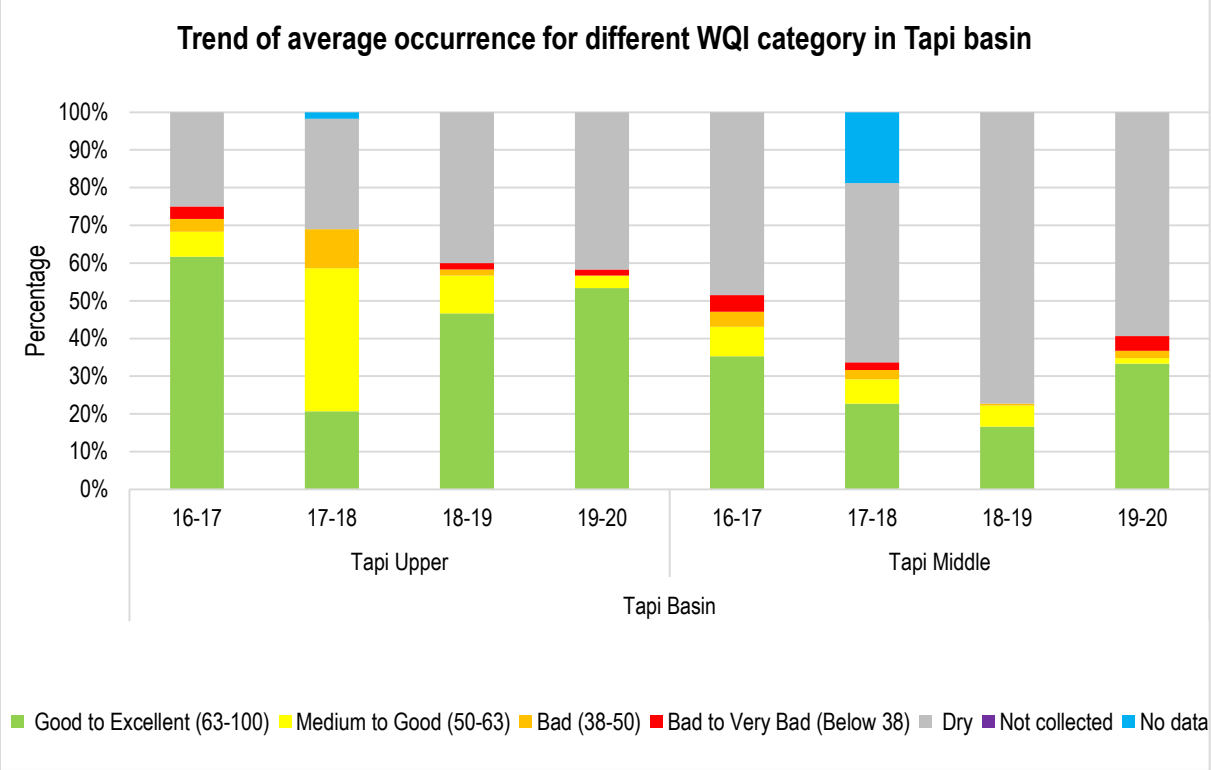
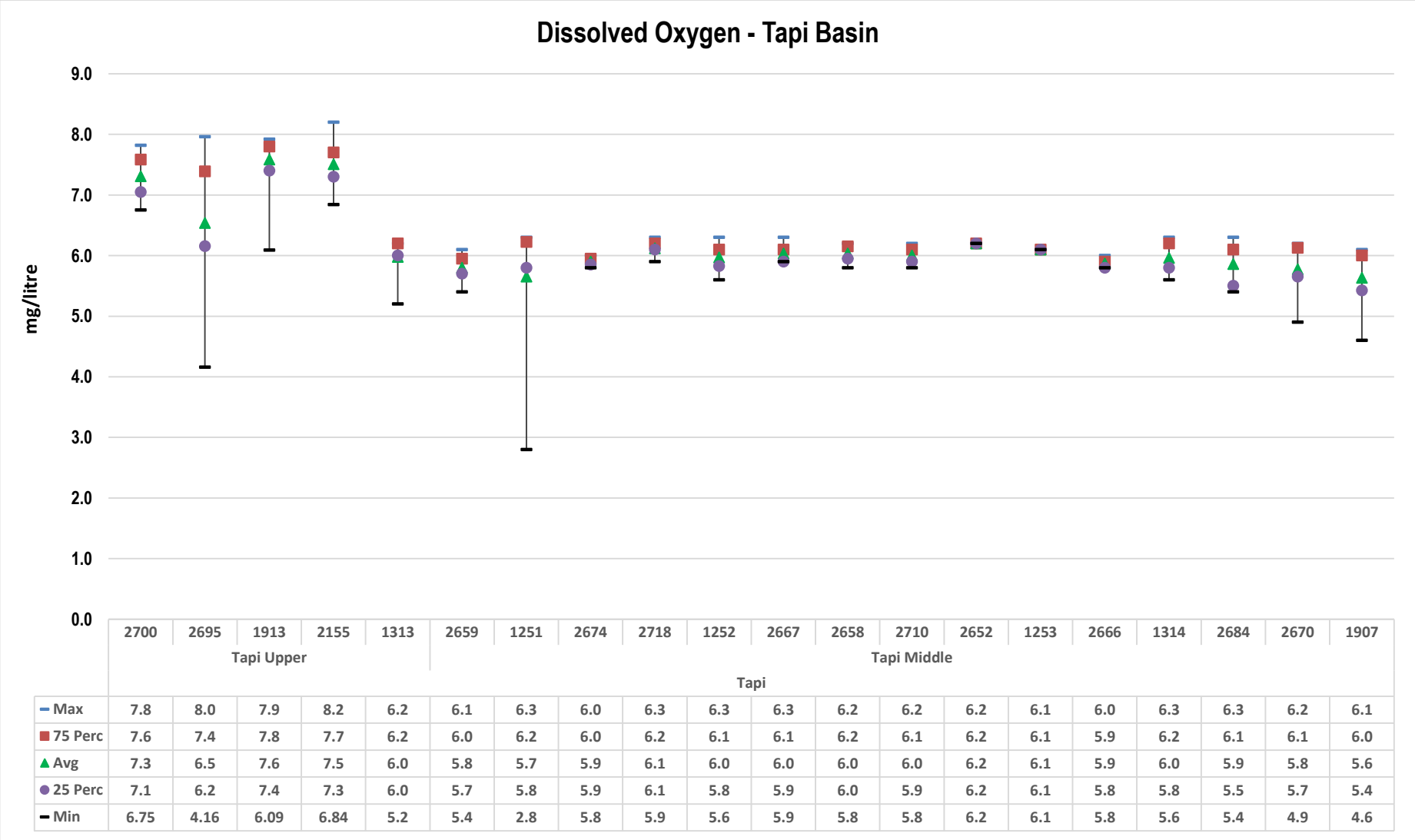


Figure No. 5: Trend in Average occurrence for different category of WQI in Tapi Basin

The depiction of Inter basin analysis of Tapi Basin has been shown in

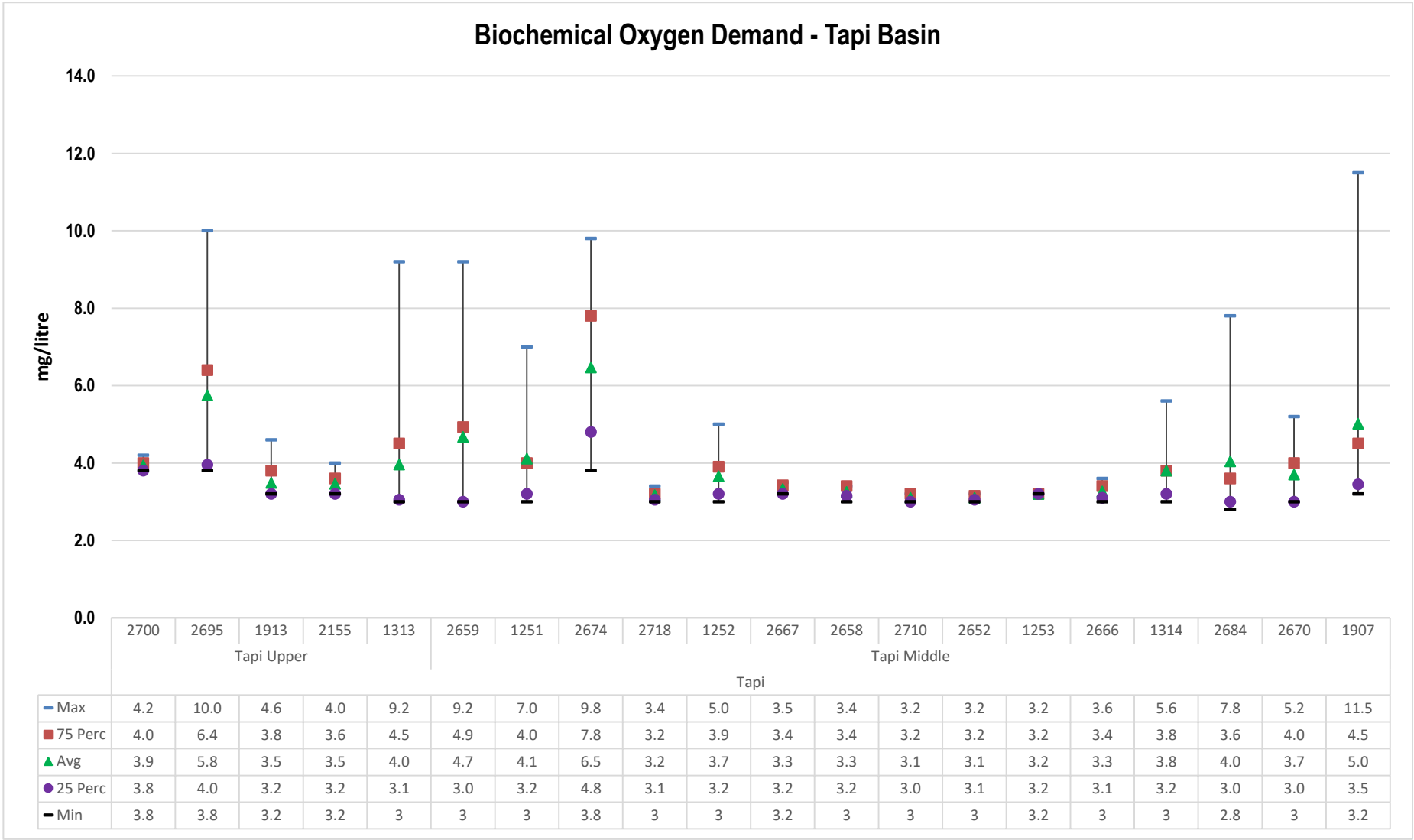
Figure No. 5. The share of observations being recorded under the 'Dry' category was found to be 41% (Tapi Upper) and 59% (Tapi Middle). Around 53% and 33% of the total observations were found to be falling under 'Good to Excellent' category at Tapi Upper and Tapi Middle respectively.

In case of 'Medium to Good' category WQI, Tapi Upper recorded 3.3% while Tapi Middle recorded 1.5% of the total observations. Annual average WQI of around 2% of the total observations recorded from Tapi Middle were found to be in 'Bad'catgeory whereas Tapi Upper recorded no observation under this category whereas in case of 'Bad to Very Bad' WQI category, only about 1.7% and 3.9% of the total observations from Tapi Upper and Tapi Middle respectively were recorded.



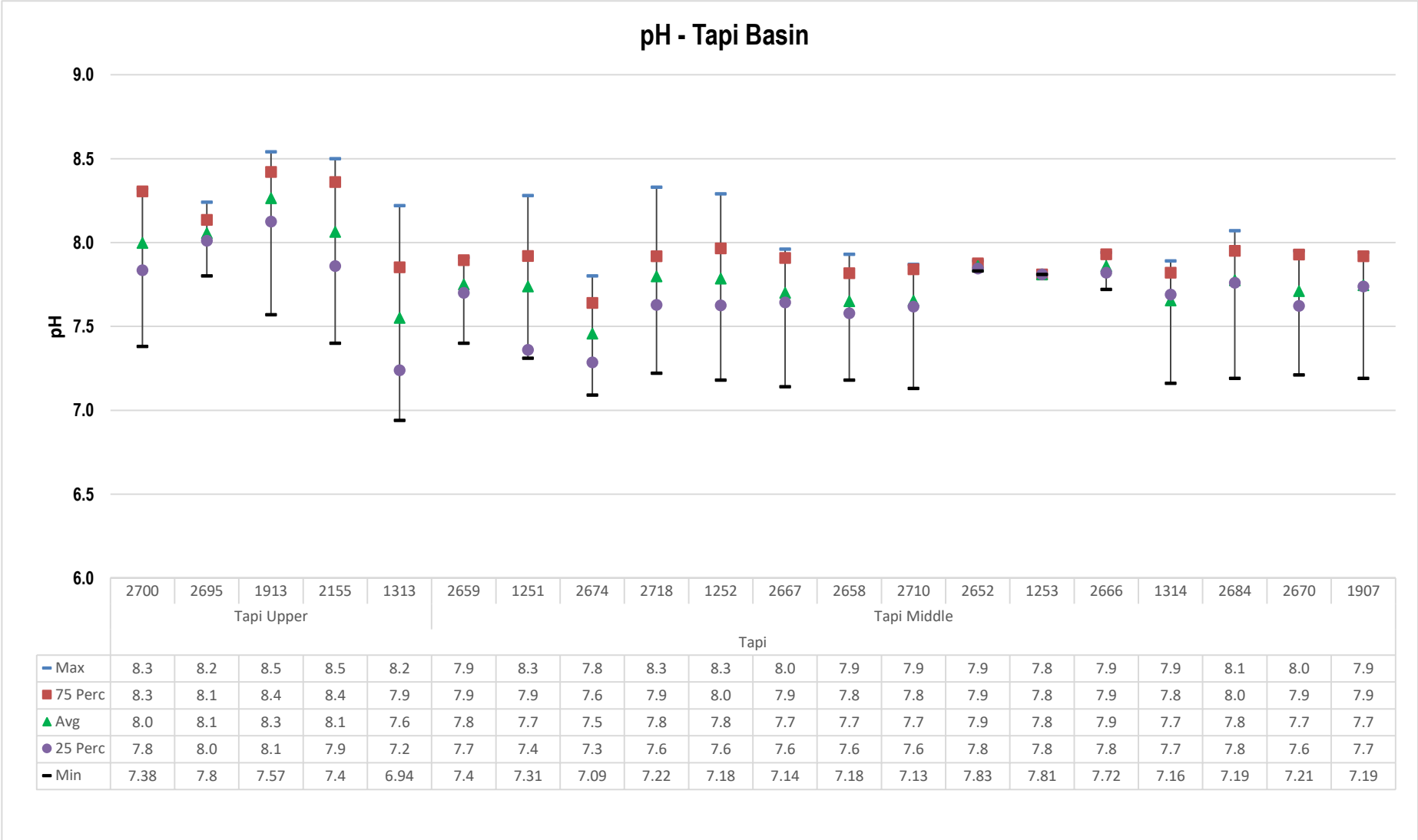
	2700	2695	1913	2155	1313	2659	1251	2674	2718	1252	2667	2658	2710	2652	1253	2666	1314	2684	2670	1907
	Tapi Upper					Tapi Middle														
	Tapi																			
Max	7.8	8.0	7.9	8.2	6.2	6.1	6.3	6.0	6.3	6.3	6.3	6.2	6.2	6.2	6.1	6.0	6.3	6.3	6.2	6.1
75 Perc	7.6	7.4	7.8	7.7	6.2	6.0	6.2	6.0	6.2	6.1	6.1	6.2	6.1	6.2	6.1	5.9	6.2	6.1	6.1	6.0
Avg	7.3	6.5	7.6	7.5	6.0	5.8	5.7	5.9	6.1	6.0	6.0	6.0	6.0	6.2	6.1	5.9	6.0	5.9	5.8	5.6
25 Perc	7.1	6.2	7.4	7.3	6.0	5.7	5.8	5.9	6.1	5.8	5.9	6.0	5.9	6.2	6.1	5.8	5.8	5.5	5.7	5.4
Min	6.75	4.16	6.09	6.84	5.2	5.4	2.8	5.8	5.9	5.6	5.9	5.8	5.8	6.2	6.1	5.8	5.6	5.4	4.9	4.6

Figure No. 6: Trend of Dissolved Oxygen (DO) levels recorded at WQMS at Tapi basin



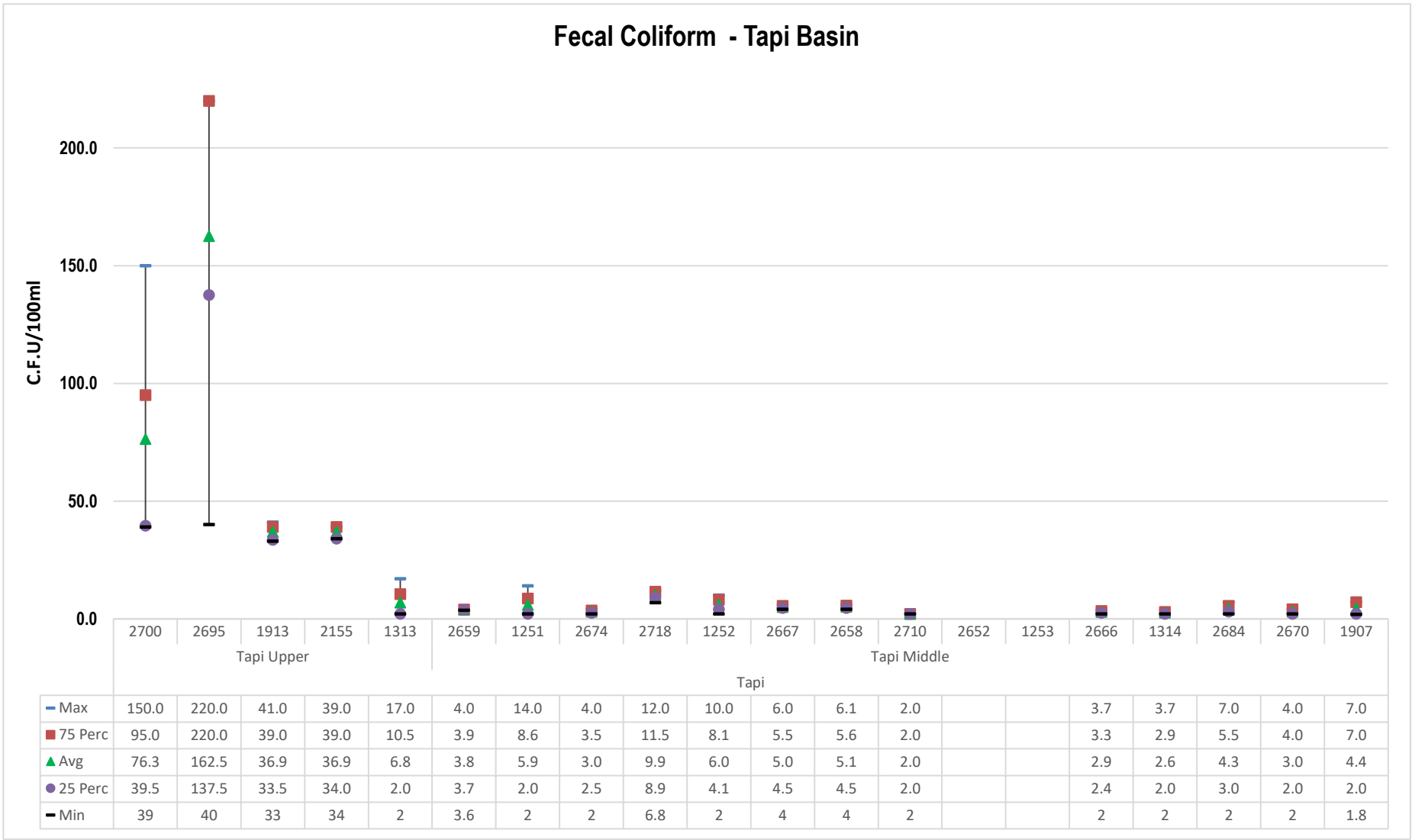
	2700	2695	1913	2155	1313	2659	1251	2674	2718	1252	2667	2658	2710	2652	1253	2666	1314	2684	2670	1907
Max	4.2	10.0	4.6	4.0	9.2	9.2	7.0	9.8	3.4	5.0	3.5	3.4	3.2	3.2	3.2	3.6	5.6	7.8	5.2	11.5
75 Perc	4.0	6.4	3.8	3.6	4.5	4.9	4.0	7.8	3.2	3.9	3.4	3.4	3.2	3.2	3.2	3.4	3.8	3.6	4.0	4.5
Avg	3.9	5.8	3.5	3.5	4.0	4.7	4.1	6.5	3.2	3.7	3.3	3.3	3.1	3.1	3.2	3.3	3.8	4.0	3.7	5.0
25 Perc	3.8	4.0	3.2	3.2	3.1	3.0	3.2	4.8	3.1	3.2	3.2	3.2	3.0	3.1	3.2	3.1	3.2	3.0	3.0	3.5
Min	3.8	3.8	3.2	3.2	3	3	3	3.8	3	3	3.2	3	3	3	3.2	3	3	2.8	3	3.2

Figure No. 7: Trend of Biological Oxygen Demand (BOD) levels recorded at WQMS at Tapi basin



	2700	2695	1913	2155	1313	2659	1251	2674	2718	1252	2667	2658	2710	2652	1253	2666	1314	2684	2670	1907
	Tapi Upper					Tapi Middle														
	Tapi																			
Max	8.3	8.2	8.5	8.5	8.2	7.9	8.3	7.8	8.3	8.3	8.0	7.9	7.9	7.9	7.8	7.9	7.9	8.1	8.0	7.9
75 Perc	8.3	8.1	8.4	8.4	7.9	7.9	7.9	7.6	7.9	8.0	7.9	7.8	7.8	7.9	7.8	7.9	7.8	8.0	7.9	7.9
Avg	8.0	8.1	8.3	8.1	7.6	7.8	7.7	7.5	7.8	7.8	7.7	7.7	7.7	7.9	7.8	7.9	7.7	7.8	7.7	7.7
25 Perc	7.8	8.0	8.1	7.9	7.2	7.7	7.4	7.3	7.6	7.6	7.6	7.6	7.6	7.8	7.8	7.8	7.7	7.8	7.6	7.7
Min	7.38	7.8	7.57	7.4	6.94	7.4	7.31	7.09	7.22	7.18	7.14	7.18	7.13	7.83	7.81	7.72	7.16	7.19	7.21	7.19

Figure No. 8: Trend of pH levels recorded at WQMS at Tapi basin



	2700	2695	1913	2155	1313	2659	1251	2674	2718	1252	2667	2658	2710	2652	1253	2666	1314	2684	2670	1907
Max	150.0	220.0	41.0	39.0	17.0	4.0	14.0	4.0	12.0	10.0	6.0	6.1	2.0			3.7	3.7	7.0	4.0	7.0
75 Perc	95.0	220.0	39.0	39.0	10.5	3.9	8.6	3.5	11.5	8.1	5.5	5.6	2.0			3.3	2.9	5.5	4.0	7.0
Avg	76.3	162.5	36.9	36.9	6.8	3.8	5.9	3.0	9.9	6.0	5.0	5.1	2.0			2.9	2.6	4.3	3.0	4.4
25 Perc	39.5	137.5	33.5	34.0	2.0	3.7	2.0	2.5	8.9	4.1	4.5	4.5	2.0			2.4	2.0	3.0	2.0	2.0
Min	39	40	33	34	2	3.6	2	2	6.8	2	4	4	2			2	2	2	2	1.8

Figure No. 9: Trend of Fecal Coliform levels recorded at WQMS at Tapi basin

Water Quality Index for WQMS in Tapi Basin

Apr	Dry	Dry	78	Dry	84	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
May	Dry	Dry	71	Dry	83	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Jun	Dry	Dry	Dry	Dry	NA	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Jul	Dry	Dry	Dry	Dry	73	76	83	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	69
Aug	70	51	75	78	85	Dry	91	85	Dry	89	Dry	Dry	Dry	Dry	Dry	Dry	86	79	85	86
Sep	77	72	75	77	89	86	89	81	90	90	86	86	88	Dry	88	85	87	79	79	75
Oct	73	67	74	74	88	86	88	83	84	84	83	84	87	88	Dry	86	85	88	86	86
Nov	Dry	Dry	70	73	NA	85	NA	Dry	NA	NA	NA	NA	NA	88	Dry	84	86	87	87	86
Dec	Dry	71	72	72	89	Dry	88	Dry	88	89	88	89	88	Dry	Dry	Dry	88	87	Dry	86
Jan	Dry	Dry	71	69	84	Dry	57	Dry	78	79	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Feb	Dry	Dry	73	79	85	Dry	80	Dry	84	78	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Mar	Dry	Dry	Dry	Dry	80	Dry	78	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Station Code	2700	2695	1913	2155	1313	2659	1251	2674	2718	1252	2667	2658	2710	2652	1253	2666	1314	2684	2670	1907
Sub Basin	Tapi Upper					Tapi Middle														
Basin	Tapi																			

Legend

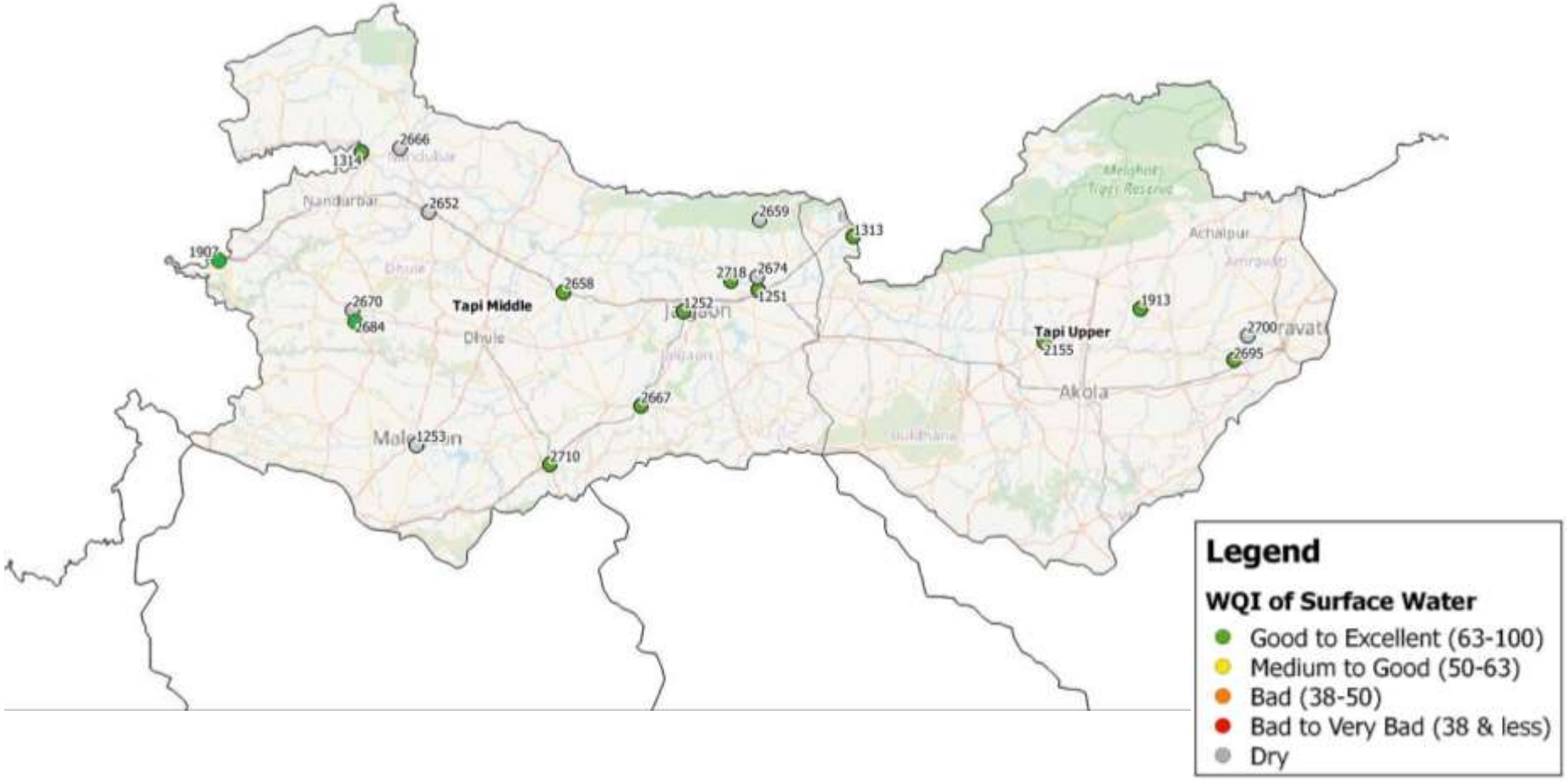
Good to Excellent	Medium to good	Bad	Bad to Very Bad	Dry	NA

Table No. 16: **Surface water quality monitoring stations in Tapi basin**

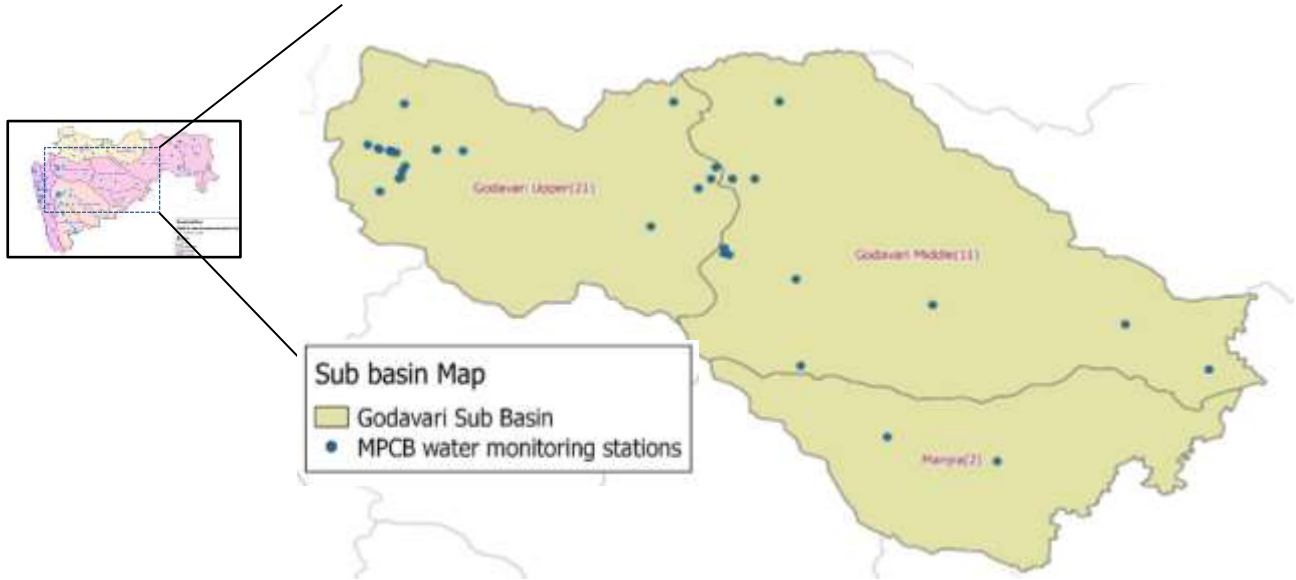
Program	Station ID	River/Nalla	Station Name	Village	Taluka	District
NWMP	2700	Purna	Purna near Achalpur-Amravati Road Bridge, Asegaon	Asegaon	Chandur bazaar	Amravati
NWMP	2695	Pedhi	Pedhi near Road Bridge at Dadhi-Pedhi village	Asegaon	Chandur Bazar	Amravati
NWMP	1913	Purna	Purna at Dhupeshwar at U/s of Malkapur Water works	Malkapur	Akola	Akola
NWMP	2155	Purna	Purna at D/s of confluence of Morna & Purna at Andhura village	Andura	Balapur	Akola
NWMP	1313	Tapi	Tapi at Ajnad	Ajnad	Raver	Jalgaon
NWMP	2659	Burai	Burai before confluece to Tapi	Mukudas	Dhule	Dhule
NWMP	1251	Tapi	Tapi at Bhusawal	Bhusawal Railway Colony	Bhusawal	Jalgaon
NWMP	2674	Mor	Mor near Padalshe	Padalashe	Jalgaon	Jalgaon
NWMP	2718	Waghur	Waghur at Sakegaon before Confluence with Tapi	Sakegaon	Jalgaon	Jalgaon
NWMP	1252	Girna	Girna at Jalgaon at intake of Girna pump house	Girna pump house area	Jalgaon	Jalgaon
NWMP	2667	Hiwara	Hiwara D/s of Pachora	Pachora	Jalgaon	Jalgaon
NWMP	2658	Bori	Bori D/s of Amalner	Amalner	Jalgaon	Jalgaon
NWMP	2710	Titur	Titur D/s of Chalisgaon	Chalisgaon	Jalgaon	Jalgaon
NWMP	2652	Amravati	Amravati D/s of Dondaicha	Dondaicha	Dhule	Dhule
NWMP	1253	Girna	Girna at Malegaon at Malegaon road bridge	Malegaon	Malegaon	Nashik
NWMP	2666	Gomai	Gomai D/s of Shahada	Shahada	Dhule	Dhule
NWMP	1314	Tapi	Tapi at Ubad village near Gujrat border	Ubad	Shahada	Nandurbar
NWMP	2684	Panjhra	Panjhra near Panzarakan SSK Ltd	Panjhre	Dhule	Dhule
NWMP	2670	Kan	Kan near Sakri water works	Sakri	Dhule	Dhule
NWMP	1907	Rangavali	Rangavali at D/s of Navapur near Rangavali bridge	Navapur	Navapur	Nandurbar

Spatial map of Surface WQI at Tapi Basin (April -2019)

Spatial map of Surface WQI at Tapi Basin (December-2019)



Godavari Basin (1 of 2): Godavari upper, Godavari Middle and Manjra Sub basin



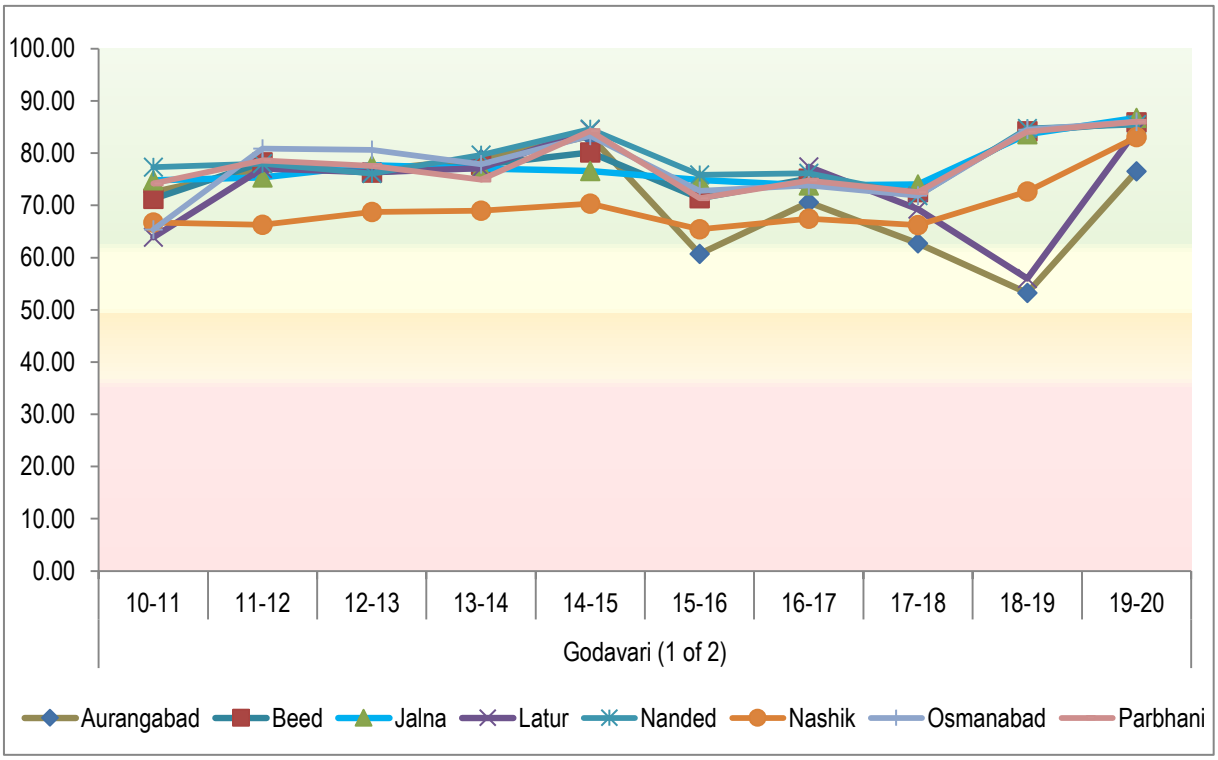
Map No. 5: Network of surface water quality monitoring stations in Godavari basin 1 of 2 –Godavari upper, Godavari middle and Manjra Sub basin

Godavari River rises in Sahyadris near Trimbakeshwar, about 80 km from the shore of the Arabian Sea, at an elevation of about 1067 meters in the Nashik district of Maharashtra state. It is the Largest peninsular river and third largest in India; the Godavari river drains about 10% of India's total geographical area. It has a catchment area spanning over 3,12,812 sq.km. The basin lies in deccan plateau and present in states of Maharashtra (48.6%), Andhra Pradesh (23.4%), Chhattisgarh (10.6%), Madhya Pradesh (10.1%), Orissa (5.6%) and Karnataka (1.4%)[23]

In Maharashtra state, the Godavari basin gets divided into 6 sub basins namely Godavari Upper, Godavari middle, Manjra, Wardha, Wainganga and Pranhita. For analysis purpose, these sub-basins have been categorized into two, Godavari 1 Basin comprising of Godavari Upper, Godavari Middle and Manjra sub-basin and Godavari 2 covering Wardha, Wainganga, and Pranhita & others.

[23] http://117.252.14.242/rbis/basin%20maps/godavari_about.htm

Godavari Basin (1 of 2) (Intra and Inter Basin analysis)



WQI	Category	Class by CPCB	Remarks
63-100	Good to Excellent	A	Non polluted
50-63	Medium to Good	B	Non polluted
38-50	Bad	C	Polluted
38 & less	Bad to Very Bad	D, E	Heavily polluted

Figure No. 10: Trend of annual average WQI across districts of Godavari basin (1 of 2)

Note: This graph considers the average WQI for all the monitoring stations in that particular district and hence may include some bias. This graph is only for an overview and monitoring station wise data maybe analyzed to pin point the most affected and polluted patches of rivers in that district

Figure No. 10 illustrates the intra basin performance and the average occurrence of different categories of WQI across all WQMS of Godavari basin (1 of 2). This part of Godavari basin (1 of 2) records annual average WQI of 8 districts namely Aurnagabad, Beed, Jalna, Latur, Nanded, Nashik, Osmanabad and Parbhani

In 2019-20, WQI of all 8 districts was recorded in 'Good to Excellent' category as compared to previous year (2018-19) in which WQI of 2 districts namely Auranagabad and Latur was recorded under the 'Medium to Good' category. This year, all districts showed increasing trend in WQI. The WQI recorded at Aurangabad and Latur showed significant improvement from 53.23 (2018-19) to 76.49 (2019-20) and 55.96 (2018-19) to 84.34 (2019-20) respectively. overall, it shows that the water quality in Godavari basin (1 of 2) has improved significaly and pollution level is less in this part of the basin.

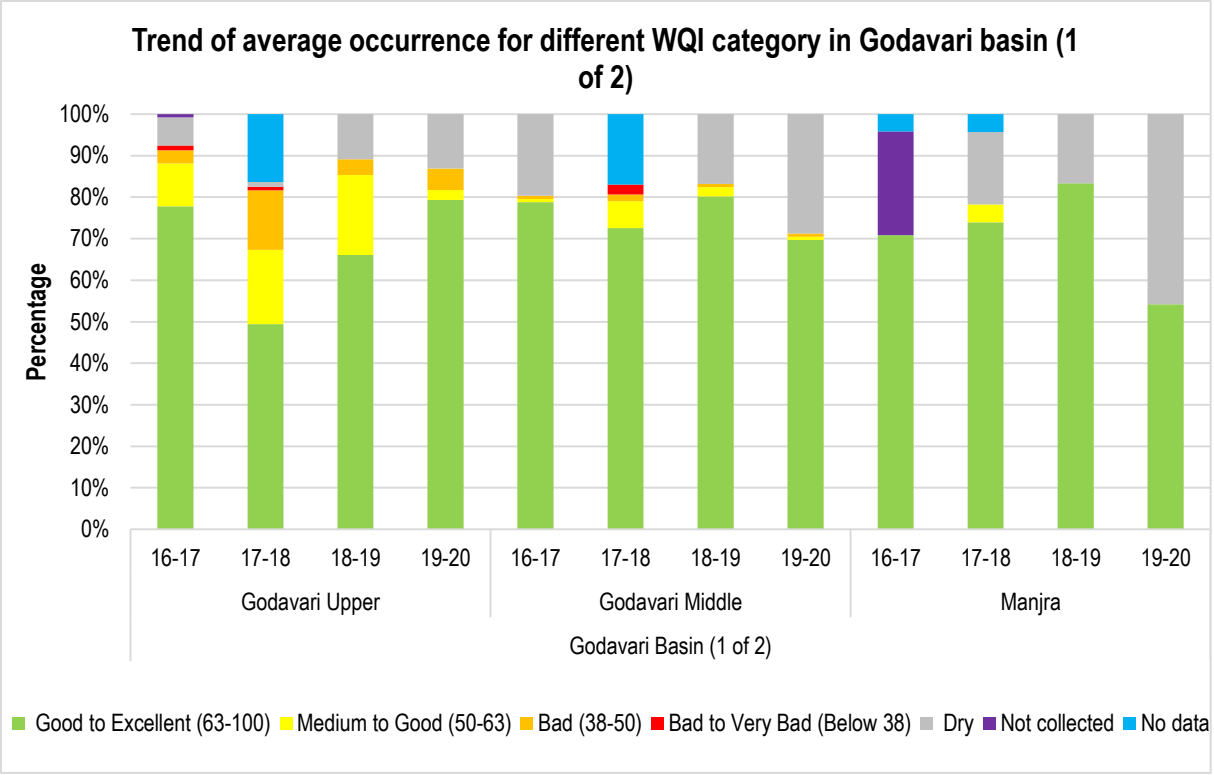


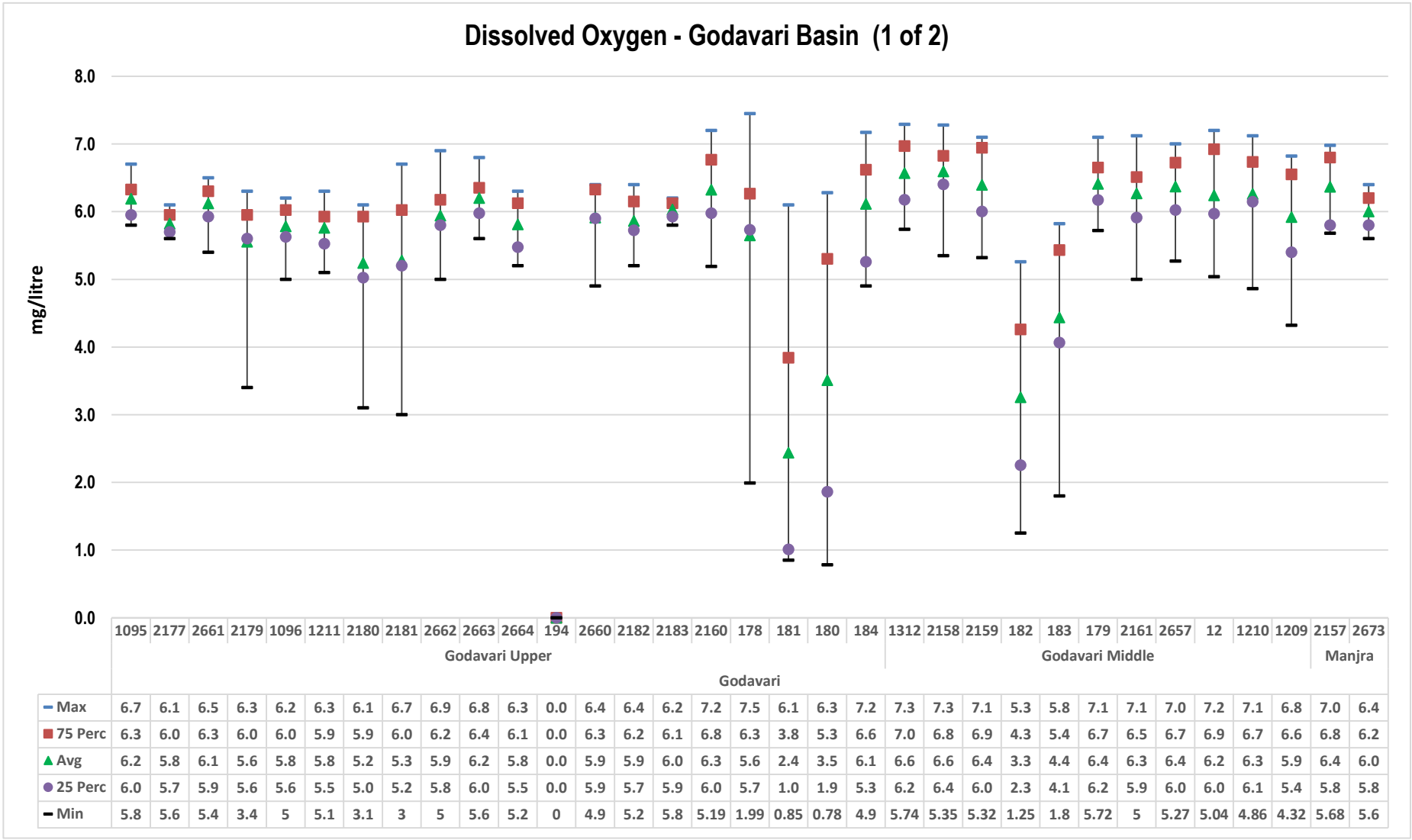
Figure No. 11: Trend of average occurrence for different category of WQI in Godavari basin (1 of 2)

There are total 34 surface water monitoring stations installed at basin 1 location. Out of this 34, 21 are installed at Upper Godavari, 11 at Middle Godavari and 2 at Manjra. The list of stations and their respective codes are listed below in Table No. 17 and Table No. 18. The intrebasin performance with respect to WQI is depicted in Figure No. 11.

As compared to previous year (2018-19), the share of observations under the 'Good to excellent' category recorded at Godavari Upper has increased from 66% to 79% while share of observations under the 'Medium to Good' category is increased from 19% to 2% (2019-20). Similarly, increasing trend was observed in case of observations recorded under 'Bad' category (4 to 5%) in 2019-20. Out of all observations, 13% of observations were come under the 'Dry' category.

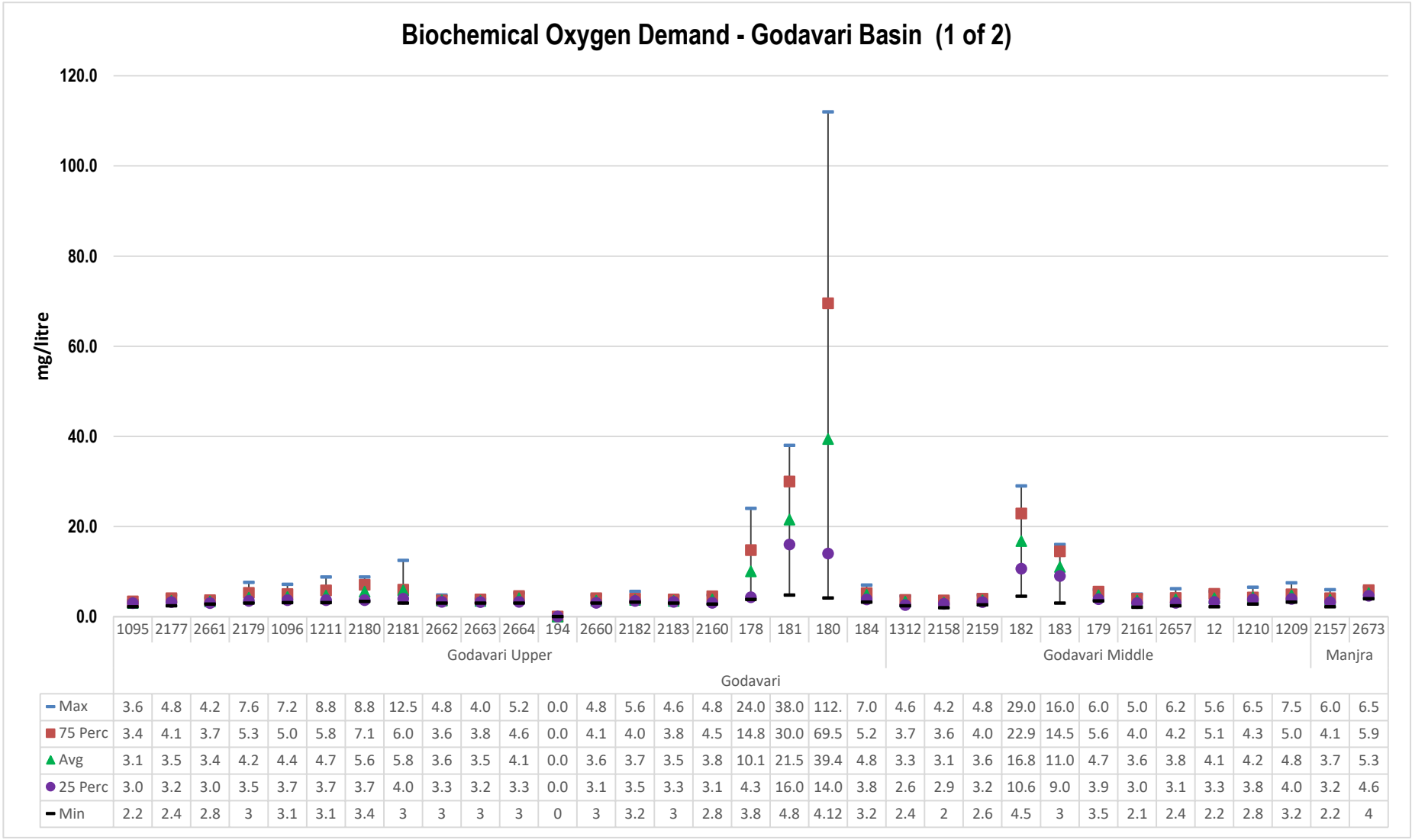
In case of Godavari Middle, a decreasing trend was observed in 'Good to Excellent' category, where the share of total observations decreased from 80% (2018-19) to 70% (2019-20) whereas percentage share of 'Medium to Good' category observations decreased from 3% to 0.8%. There was a miniscule change observed in case of 'Bad' category.

In case of Manjra sub basin, the share of 'Dry' category observations was found to be increased from 17% in 2018-19 to 45%. Around 54%of the observations were recorded under 'Good to Excellent' category in 2019-20. No single observation was recorded under 'Medium to Good', 'Bad' and 'Bad to Very Bad' categories.



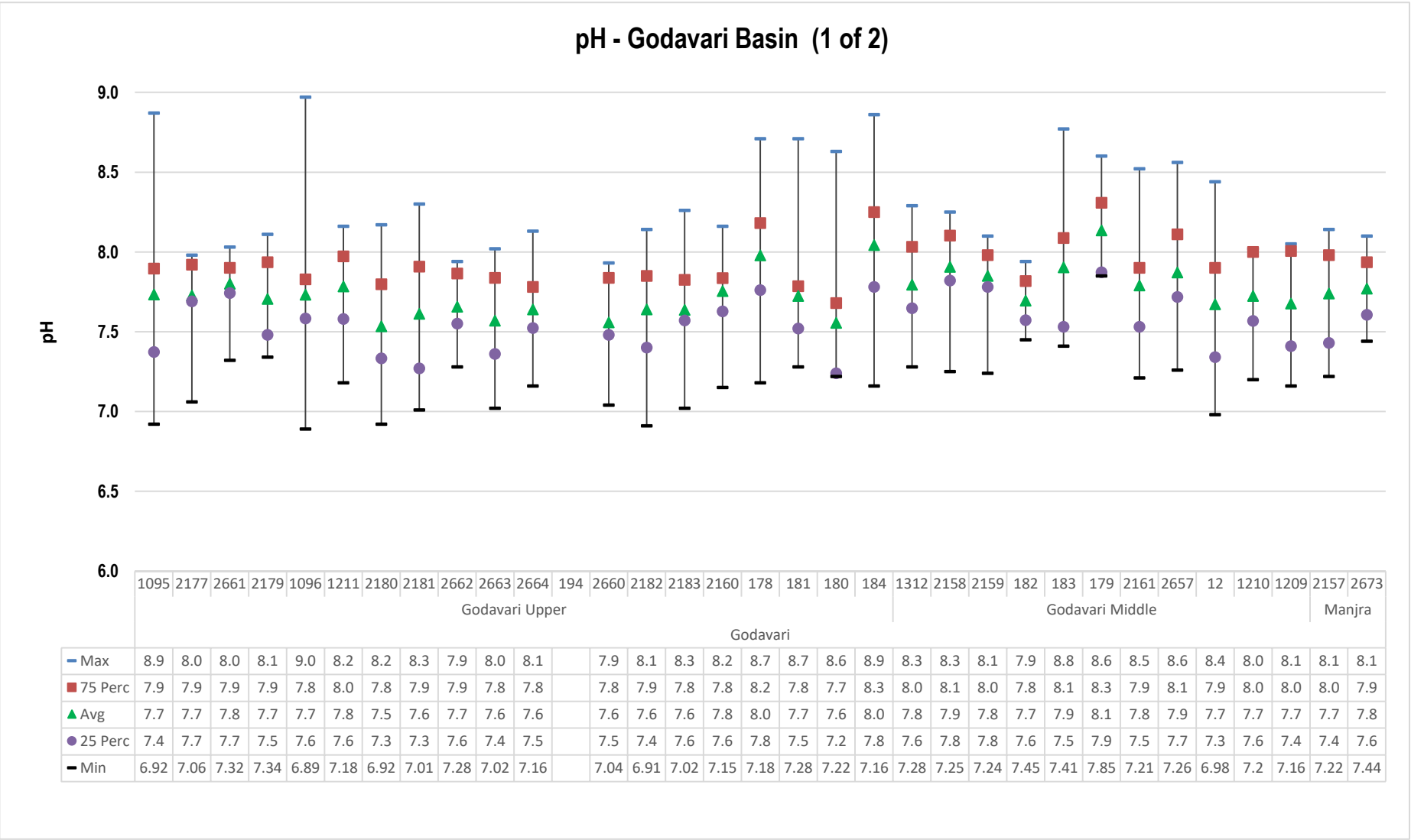
	1095	2177	2661	2179	1096	1211	2180	2181	2662	2663	2664	194	2660	2182	2183	2160	178	181	180	184	1312	2158	2159	182	183	179	2161	2657	12	1210	1209	2157	2673
	Godavari Upper																				Godavari Middle										Manjra	
	Godavari																															
Max	6.7	6.1	6.5	6.3	6.2	6.3	6.1	6.7	6.9	6.8	6.3	0.0	6.4	6.4	6.2	7.2	7.5	6.1	6.3	7.2	7.3	7.3	7.1	5.3	5.8	7.1	7.1	7.0	7.2	7.1	6.8	7.0	6.4
75 Perc	6.3	6.0	6.3	6.0	6.0	5.9	5.9	6.0	6.2	6.4	6.1	0.0	6.3	6.2	6.1	6.8	6.3	3.8	5.3	6.6	7.0	6.8	6.9	4.3	5.4	6.7	6.5	6.7	6.9	6.7	6.6	6.8	6.2
Avg	6.2	5.8	6.1	5.6	5.8	5.8	5.2	5.3	5.9	6.2	5.8	0.0	5.9	5.9	6.0	6.3	5.6	2.4	3.5	6.1	6.6	6.6	6.4	3.3	4.4	6.4	6.3	6.4	6.2	6.3	5.9	6.4	6.0
25 Perc	6.0	5.7	5.9	5.6	5.6	5.5	5.0	5.2	5.8	6.0	5.5	0.0	5.9	5.7	5.9	6.0	5.7	1.0	1.9	5.3	6.2	6.4	6.0	2.3	4.1	6.2	5.9	6.0	6.0	6.1	5.4	5.8	5.8
Min	5.8	5.6	5.4	3.4	5	5.1	3.1	3	5	5.6	5.2	0	4.9	5.2	5.8	5.19	1.99	0.85	0.78	4.9	5.74	5.35	5.32	1.25	1.8	5.72	5	5.27	5.04	4.86	4.32	5.68	5.6

Figure No. 12: Trend of Dissolved Oxygen (DO) levels recorded at WQMS at Godavari basin (1of 2)



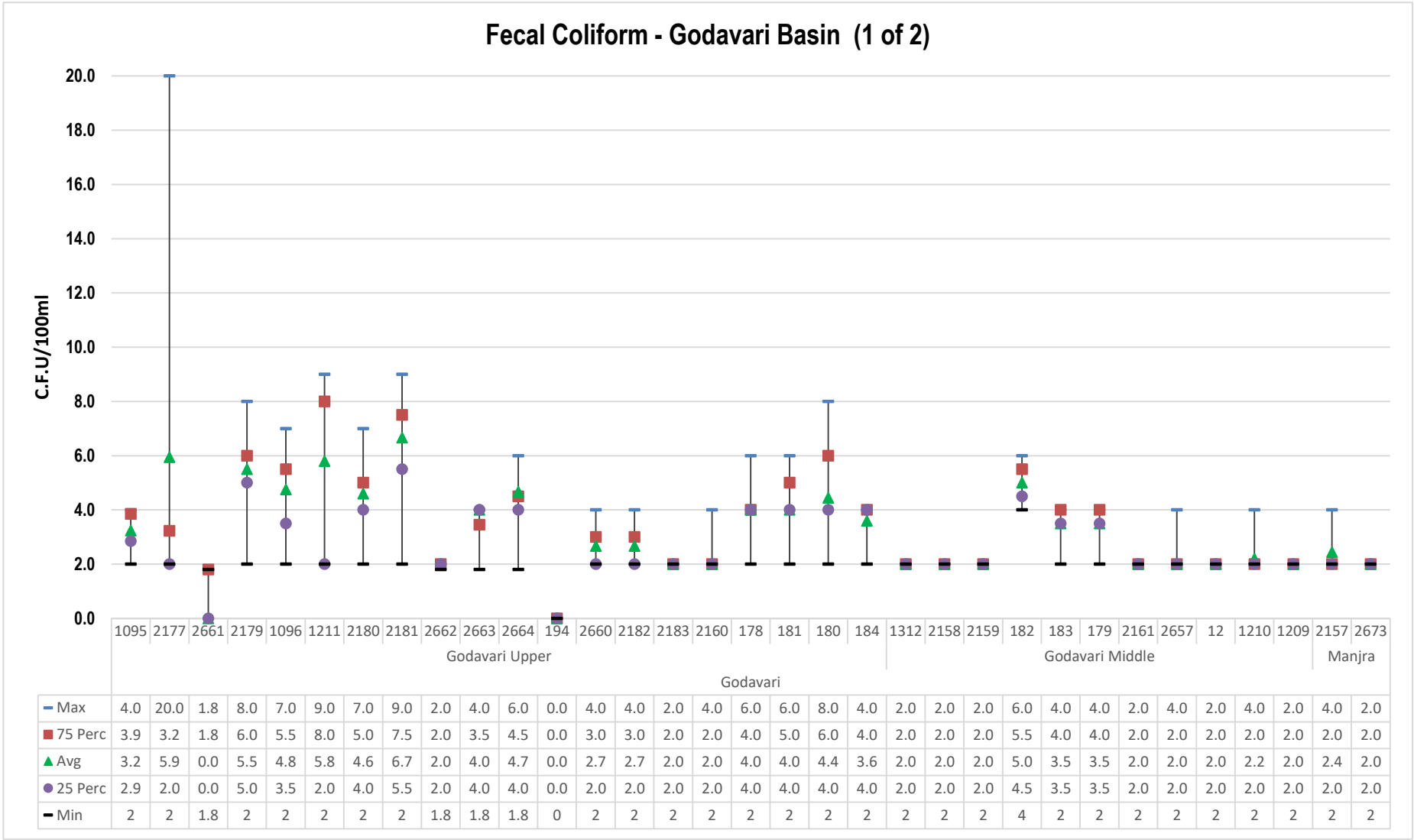
	1095	2177	2661	2179	1096	1211	2180	2181	2662	2663	2664	194	2660	2182	2183	2160	178	181	180	184	1312	2158	2159	182	183	179	2161	2657	12	1210	1209	2157	2673
Max	3.6	4.8	4.2	7.6	7.2	8.8	8.8	12.5	4.8	4.0	5.2	0.0	4.8	5.6	4.6	4.8	24.0	38.0	112.	7.0	4.6	4.2	4.8	29.0	16.0	6.0	5.0	6.2	5.6	6.5	7.5	6.0	6.5
75 Perc	3.4	4.1	3.7	5.3	5.0	5.8	7.1	6.0	3.6	3.8	4.6	0.0	4.1	4.0	3.8	4.5	14.8	30.0	69.5	5.2	3.7	3.6	4.0	22.9	14.5	5.6	4.0	4.2	5.1	4.3	5.0	4.1	5.9
Avg	3.1	3.5	3.4	4.2	4.4	4.7	5.6	5.8	3.6	3.5	4.1	0.0	3.6	3.7	3.5	3.8	10.1	21.5	39.4	4.8	3.3	3.1	3.6	16.8	11.0	4.7	3.6	3.8	4.1	4.2	4.8	3.7	5.3
25 Perc	3.0	3.2	3.0	3.5	3.7	3.7	3.7	4.0	3.3	3.2	3.3	0.0	3.1	3.5	3.3	3.1	4.3	16.0	14.0	3.8	2.6	2.9	3.2	10.6	9.0	3.9	3.0	3.1	3.3	3.8	4.0	3.2	4.6
Min	2.2	2.4	2.8	3	3.1	3.1	3.4	3	3	3	3	0	3	3.2	3	2.8	3.8	4.8	4.12	3.2	2.4	2	2.6	4.5	3	3.5	2.1	2.4	2.2	2.8	3.2	2.2	4

Figure No. 13: Trend of Biological Oxygen Demand (BOD) levels recorded at WQMS at Godavari basin (1 of 2)



	1095	2177	2661	2179	1096	1211	2180	2181	2662	2663	2664	194	2660	2182	2183	2160	178	181	180	184	1312	2158	2159	182	183	179	2161	2657	12	1210	1209	2157	2673
	Godavari Upper												Godavari								Godavari Middle											Manjra
Max	8.9	8.0	8.0	8.1	9.0	8.2	8.2	8.3	7.9	8.0	8.1		7.9	8.1	8.3	8.2	8.7	8.7	8.6	8.9	8.3	8.3	8.1	7.9	8.8	8.6	8.5	8.6	8.4	8.0	8.1	8.1	8.1
75 Perc	7.9	7.9	7.9	7.9	7.8	8.0	7.8	7.9	7.9	7.8	7.8		7.8	7.9	7.8	7.8	8.2	7.8	7.7	8.3	8.0	8.1	8.0	7.8	8.1	8.3	7.9	8.1	7.9	8.0	8.0	8.0	7.9
Avg	7.7	7.7	7.8	7.7	7.7	7.8	7.5	7.6	7.7	7.6	7.6		7.6	7.6	7.6	7.8	8.0	7.7	7.6	8.0	7.8	7.9	7.8	7.7	7.9	8.1	7.8	7.9	7.7	7.7	7.7	7.7	7.8
25 Perc	7.4	7.7	7.7	7.5	7.6	7.6	7.3	7.3	7.6	7.4	7.5		7.5	7.4	7.6	7.6	7.8	7.5	7.2	7.8	7.6	7.8	7.8	7.6	7.5	7.9	7.5	7.7	7.3	7.6	7.4	7.4	7.6
Min	6.92	7.06	7.32	7.34	6.89	7.18	6.92	7.01	7.28	7.02	7.16		7.04	6.91	7.02	7.15	7.18	7.28	7.22	7.16	7.28	7.25	7.24	7.45	7.41	7.85	7.21	7.26	6.98	7.2	7.16	7.22	7.44

Figure No. 14: Trend of pH levels recorded at WQMS at Godavari basin (1 of 2)



	1095	2177	2661	2179	1096	1211	2180	2181	2662	2663	2664	194	2660	2182	2183	2160	178	181	180	184	1312	2158	2159	182	183	179	2161	2657	12	1210	1209	2157	2673
	Godavari Upper																				Godavari Middle										Manjra	
	Godavari																															
Max	4.0	20.0	1.8	8.0	7.0	9.0	7.0	9.0	2.0	4.0	6.0	0.0	4.0	4.0	2.0	4.0	6.0	6.0	8.0	4.0	2.0	2.0	2.0	6.0	4.0	4.0	2.0	4.0	2.0	4.0	2.0	4.0	2.0
75 Perc	3.9	3.2	1.8	6.0	5.5	8.0	5.0	7.5	2.0	3.5	4.5	0.0	3.0	3.0	2.0	2.0	4.0	5.0	6.0	4.0	2.0	2.0	2.0	5.5	4.0	4.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Avg	3.2	5.9	0.0	5.5	4.8	5.8	4.6	6.7	2.0	4.0	4.7	0.0	2.7	2.7	2.0	2.0	4.0	4.0	4.4	3.6	2.0	2.0	2.0	5.0	3.5	3.5	2.0	2.0	2.0	2.2	2.0	2.4	2.0
25 Perc	2.9	2.0	0.0	5.0	3.5	2.0	4.0	5.5	2.0	4.0	4.0	0.0	2.0	2.0	2.0	2.0	4.0	4.0	4.0	4.0	2.0	2.0	2.0	4.5	3.5	3.5	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Min	2	2	1.8	2	2	2	2	2	1.8	1.8	1.8	0	2	2	2	2	2	2	2	2	2	2	2	4	2	2	2	2	2	2	2	2	2

Figure No. 15: Trend of Fecal Coliform levels recorded at WQMS at Godavari basin (1 of 2)

Water Quality Index for WQMS in Godavari Basin (1 of 2): Sub-Basin - Godavari Upper

Apr	89	85	89	88	87	83	87	88	90	86	89	Dry	89	90	88	90	Dry	55	44	Dry
May	86	84	87	79	79	77	78	Dry	86	88	85	Dry	85	82	84	90	Dry	65	73	Dry
Jun	91	86	91	86	82	83	86	Dry	89	88	88	Dry	87	85	88	85	Dry	49	42	Dry
Jul	89	87	87	80	83	73	78	83	82	90	84	Dry	85	88	88	87	68	46	47	Dry
Aug	90	88	91	82	82	83	80	77	93	92	83	Dry	91	92	89	83	Dry	53	45	Dry
Sep	91	90	86	82	83	81	74	64	85	90	81	Dry	84	84	88	85	79	48	64	Dry
Oct	88	85	89	89	79	85	79	80	85	82	86	Dry	87	83	88	85	Dry	Dry	Dry	Dry
Nov	86	84	91	80	85	83	79	77	89	82	89	Dry	87	84	89	82	52	55	49	76
Dec	90	85	88	90	86	88	86	85	89	89	86	Dry	88	89	88	89	81	44	41	83
Jan	76	81	80	64	77	84	76	82	81	89	77	Dry	78	80	82	85	79	45	38	77
Feb	86	Dry	80	77	77	75	69	74	81	85	86	Dry	80	75	75	88	78	67	71	73
Mar	91	77	79	Dry	77	70	54	50	80	80	77	Dry	84	78	83	92	89	87	88	89
Station Code	1095	2177	2661	2179	1096	1211	2180	2181	2662	2663	2664	194	2660	2182	2183	2160	178	181	180	184
Sub Basin	Godavari Upper																			
Basin	Godavari																			

Legend

Good to Excellent	Medium to good	Bad	Bad to Very Bad	Dry	NA

Table No. 17: Surface water quality monitoring stations in Godavari Basin (1 of 2)

Program	Station ID	River/Nalla	Station Name	Village	Taluka	District
NWMP	1095	Godavari	Godavari at U/s of Gangapur Dam	Gangapur	Nashik	Nashik
NWMP	2177	Godavari	Godavari near Someshwar Temple	Someshwar	Nashik	Nashik
NWMP	2661	Darna	Darna at Aswali (Darna Dam)	Aswali	Igatpuri	Nashik
NWMP	2179	Godavari	Godavari at Hanuman Ghat	Nashik city	Nashik	Nashik
NWMP	1096	Godavari	Godavari at Panchavati at Ramkund	Panchavati	Nashik	Nashik
NWMP	1211	Godavari	Godavari at Nashik D/s of near Amardham	Gadgebaba Maharaj Nagar	Nashik	Nashik
NWMP	2180	Godavari	Godavari at near Tapovan	Tapovan	Nashik	Nashik
NWMP	2181	Godavari	Godavari at Kapila -Godavari confluence point	Tapovan	Nashik	Nashik
NWMP	2662	Darna	Darna at MES site Pumping station	Bhagur	Nashik	Nashik
NWMP	2663	Darna	Darna at Bhagur Pumping station near Pandhurli Bridge	Bhagur	Nashik	Nashik
NWMP	2664	Darna	Darna at Sansari	Sansari	Nashik	Nashik
SWMP	194	Kadwa	Kadwa at Awankhed Village, Taluka - Dindori, District - Nashik	Awankhed Village	Dindori	Nashik
NWMP	2660	Darna	Darna at Chehedi pumping station	Chehedi	Nashik	Nashik
NWMP	2182	Godavari	Godavari at Saikheda	Saikheda	Niphad	Nashik
NWMP	2183	Godavari	Godavari at Nandur-Madhameshwar Dam	Nandur	Niphad	Nashik
NWMP	2160	Godavari	Godavari at U/s of Aurangabad Reservoir Kaigaon Tokka near, Kaigaon Bridge	Kaigaon	Gangapur	Aurangabad

Program	Station ID	River/Nalla	Station Name	Village	Taluka	District
SWMP	178	Shivna	Kannad - D/S of Kannad near Bridge	Kannad	Kannad	Aurangabad
SWMP	181	Kham	Aurangabad - Near Patoda Village	Aurangabad	Aurangabad	Aurangabad
SWMP	180	Kham	Aurangabad - Near Holly cross bridge	Aurangabad	Aurangabad	Aurangabad
SWMP	184	Harsool Dam	Aurangabad - Harsool Dam	Aurangabad	Aurangabad	Aurangabad

Water Quality Index for WQMS in Godavari Basin (1 of 2): Sub-Basin - Godavari Middle and Manjra

Apr	86	83	88	Dry	Dry	Dry	87	86	88	91	Dry	83	Dry
May	87	88	87	Dry	Dry	Dry	90	84	Dry	85	Dry	87	Dry
Jun	88	88	86	Dry	Dry	Dry	88	87	Dry	86	Dry	86	Dry
Jul	91	88	85	48	Dry	Dry	91	92	Dry	87	Dry	84	Dry
Aug	86	86	Dry	Dry	Dry	Dry	84	81	82	79	78	85	Dry
Sep	83	86	87	Dry	Dry	Dry	88	81	86	88	78	81	Dry
Oct	85	86	84	Dry	Dry	Dry	86	84	79	85	84	Dry	Dry
Nov	86	88	82	77	85	82	79	85	86	83	82	88	83
Dec	86	87	86	Dry	50	84	86	88	89	87	87	86	86
Jan	88	85	87	Dry	64	79	Dry	83	87	88	85	88	Dry
Feb	90	88	86	Dry	74	82	Dry	89	Dry	86	89	89	Dry
Mar	93	93	93	Dry	Dry	Dry	Dry	92	92	91	92	90	Dry
Station Code	1312	2158	2159	182	183	179	2161	2657	12	1210	1209	2157	2673
Sub Basin	Godavari Middle											Manjra	
Basin	Godavari												

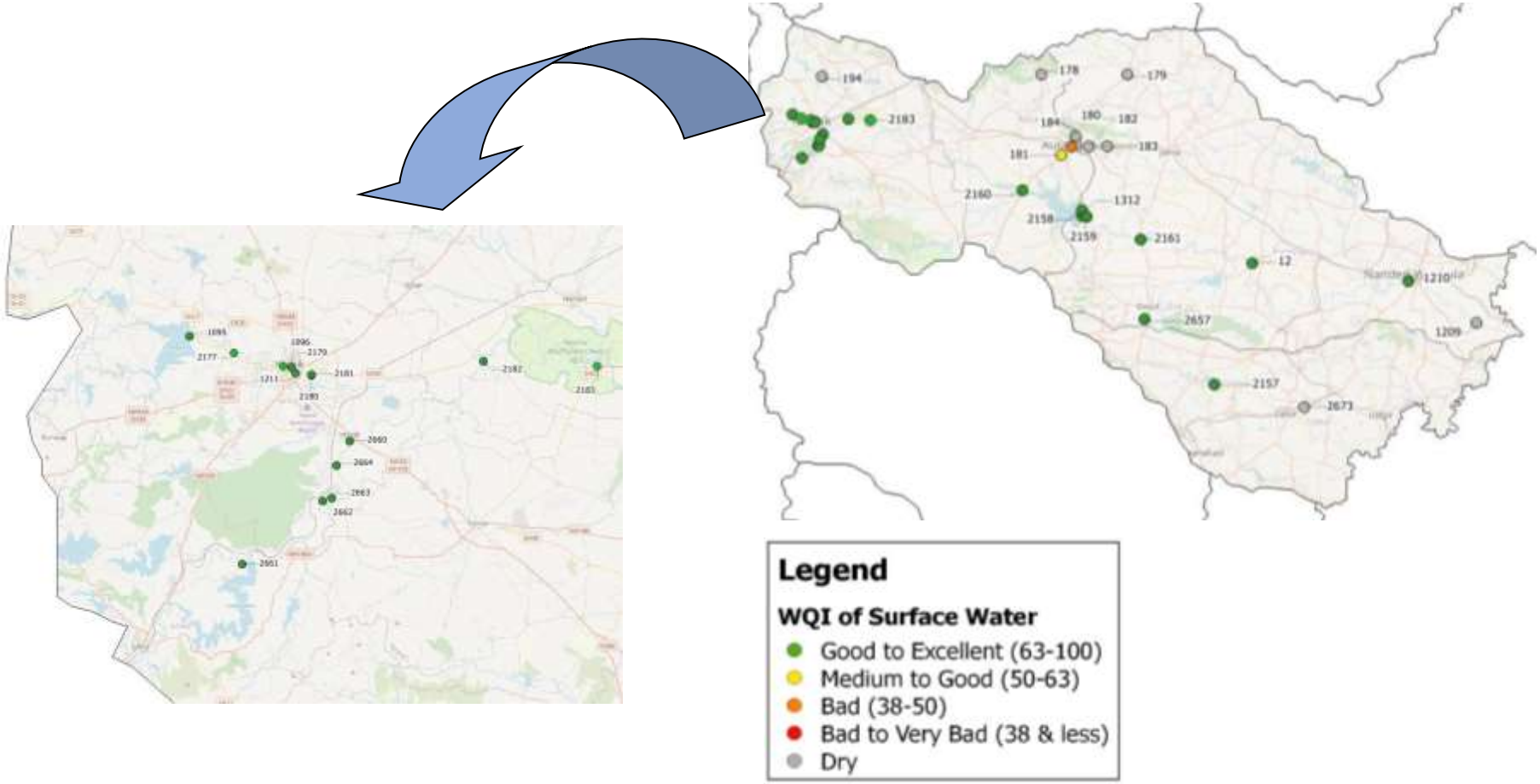
Legend

Good to Excellent	Medium to good	Bad	Bad to Very Bad	Dry	NA

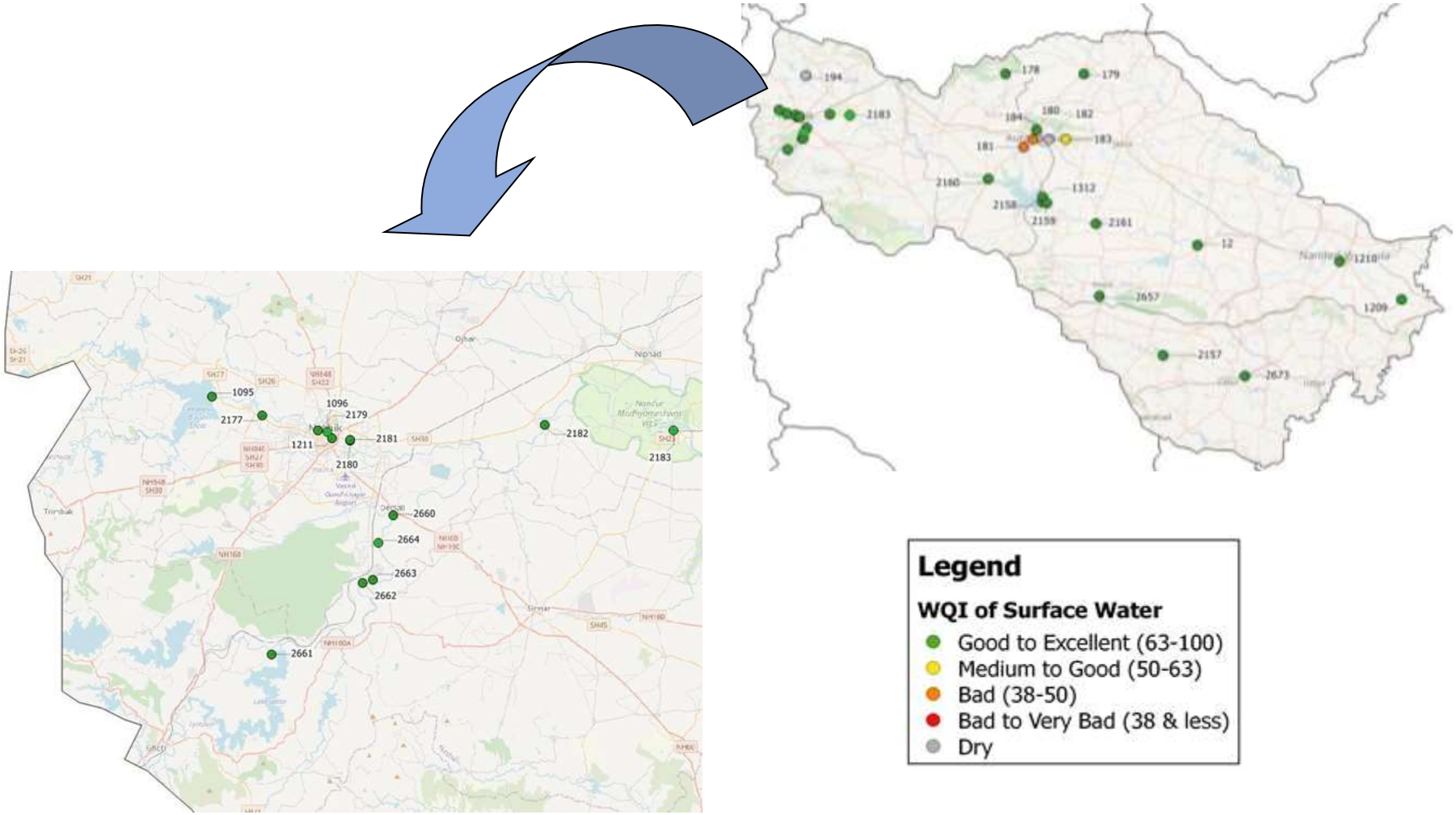
Table No. 18: **Surface water quality monitoring stations in Godavari Basin (1of 2)**

Program	Station ID	River/Nalla	Station Name	Village	Taluka	District
NWMP	1312	Godavari	Godavari at Jaikwadi Dam, Paithan	Paithan	Paithan	Aurangabad
NWMP	2158	Godavari	Godavari at Paithan U/s of Paithan Intake pump house	Jayakwadi	Paithan	Aurangabad
NWMP	2159	Godavari	Godavari at D/s of Paithan at Pathegaon bridge	Pathegaon	Paithan	Aurangabad
SWMP	182	Sukhna	Aurangabad - Near Chikhalthana Bridge	Aurangabad	Aurangabad	Aurangabad
SWMP	183	Sukhna Dam	Aurangabad - At Sukhna Dam	Aurangabad	Aurangabad	Aurangabad
SWMP	179	Purna	Sillod - D/S of Sillod near bridge at bhavan	Sillod	Sillod	Aurangabad
NWMP	2161	Godavari	Godavari at Jalna Intake water pump house Shahagad	Shahabad	Ambad	Jalna
NWMP	2657	Bindusara	Bindusara at Beed, near Intake water pump house at Dam	Paligaon	Beed	Beed
NWMP	12	Godavari	Godavari at Dhalegaon	Dhalegaon	Pathari	Parbhani
NWMP	1210	Godavari	Godavari at Intake of pump house	Vishnupuri	Nanded	Nanded
NWMP	1209	Godavari	Godavari at Raher	Raher	Nayagaon	Nanded
NWMP	2157	Godavari	Godavari at Latur Water intake near pump house	Dhamegaon	Kalumb	Osmanabad
NWMP	2673	Manjra	Manjra at D/s of Latur, near Latur-Nanded Bridge	Bhatkheda	Latur	Latur

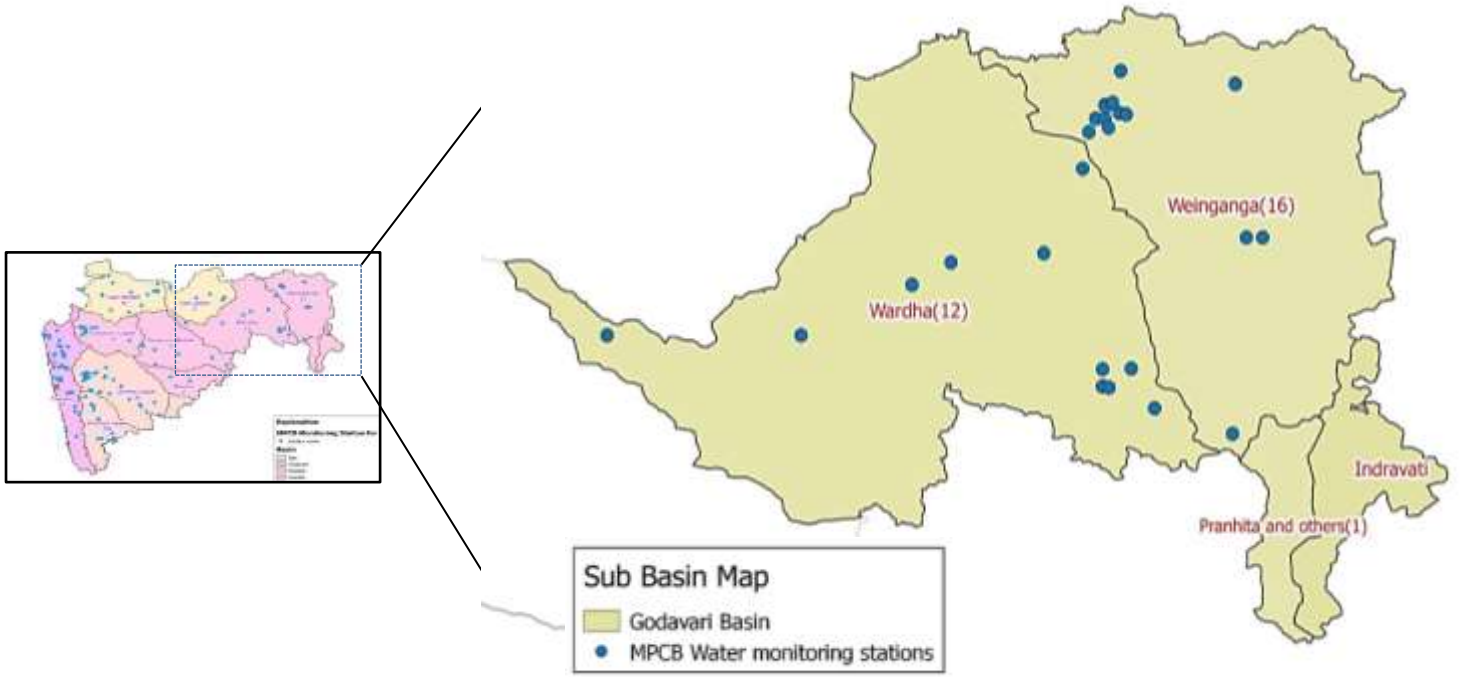
Spatial map of SurfaceWQI at Godavari Basin (1 of 2) (April 2019)



Spatial map of Surface WQI at Godavari Basin (1 of 2) (December 2019)



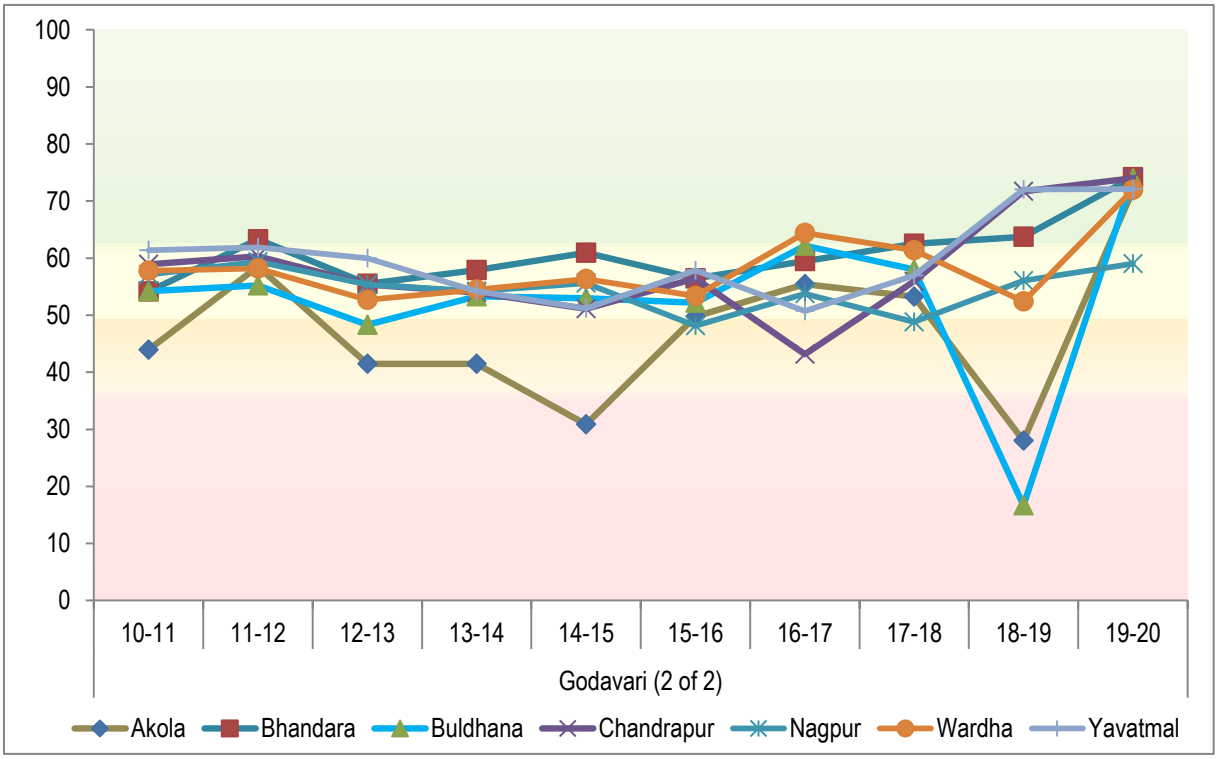
Godavari Basin (2 of 2): Wardha, Wainganga and Pranhita Sub basin



Map No. 6: Network of surface water quality monitoring stations in Godavari basin 2 of 2 –Wardha, Wainganga and Pranhita Sub basin

In basin 2, there are total 29 surface water monitoring stations (12 on Wardha, 16 on Wainganga and 1 on Pranhita). The list of stations and codes has been provided below in Table No. 19 and Table No. 20

Godavari Basin (2 of 2) (Intra Basin analysis)



WQI	Category	Class by CPCB	Remarks
63-100	Good to Excellent	A	Non polluted
50-63	Medium to Good	B	Non polluted
38-50	Bad	C	Polluted
38 & less	Bad to Very Bad	D, E	Heavily polluted

Figure No. 16: Trend of annual average WQI across districts of Godavari basin (2 of 2)

Note: This graph considers the average WQI for all the monitoring stations in that particular district and hence may include some bias. This graph is only for an overview and monitoring station wise data maybe analyzed to pin point the most affected and polluted patches of rivers in that district

Figure No. 16 depicts the intra basin performance of Godavari basin (2 of 2) across seven districts of the state. All 7 districts under the Godavari basin (2 of 2) recorded improvement in WQI. Except Nagpur, all 6 districts recorded observations in 'Good to Excellent' category. In case of Nagpur, observations were recorded under 'Medium to Good' category.

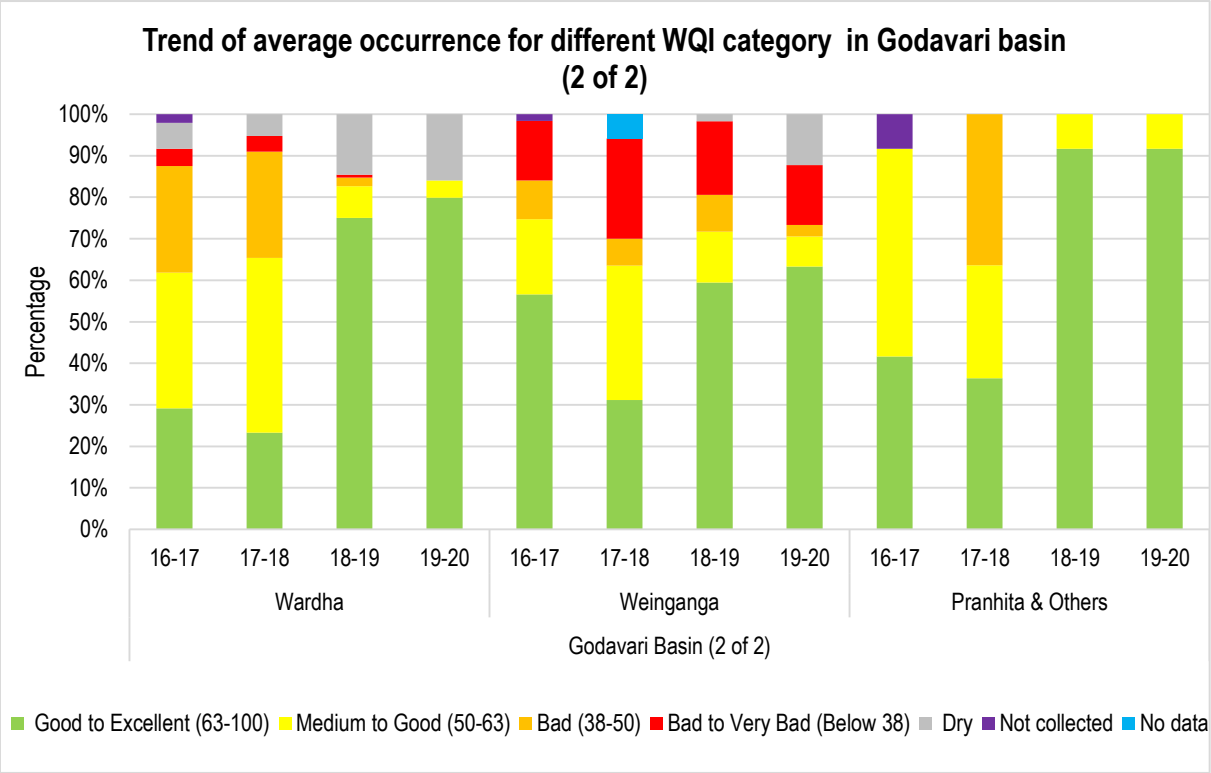


Figure No. 17: Trend of average occurrence for different category of WQI in Godavari basin (2 of 2)

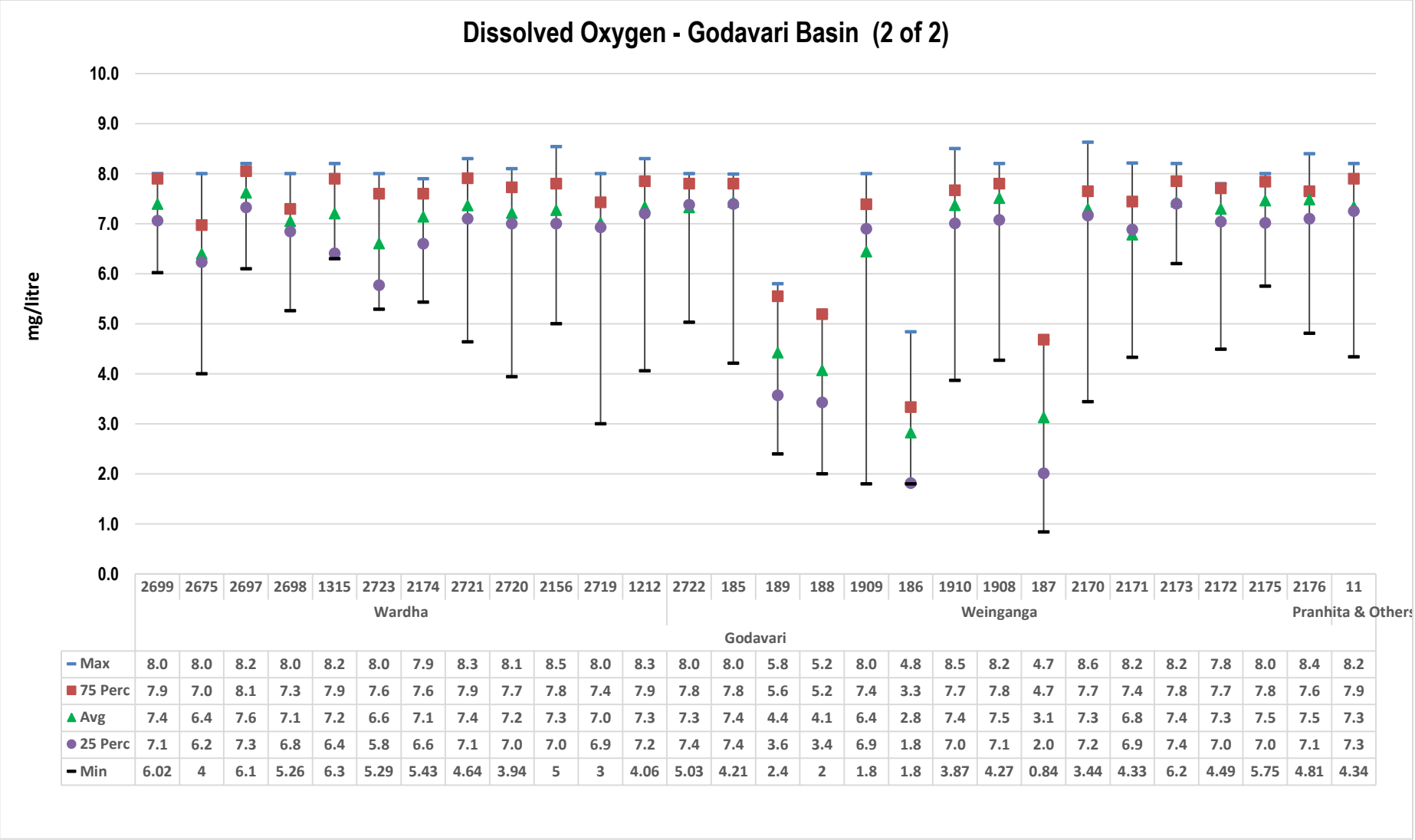
Illustration of interbasin water quality analysis for Godavari basin (2 of 2) is shown in Figure No. 17.

In 2019-20, both Wardha and Wainganaga sub basin recorded increase in 'Good to Excellent' catrgory observations. Wardha recorded increase from 75% to 80% whereas Wainganga recorded increase from 59% to about 63% of the total observations. On the other hand, a decreasing trend was observed in case of 'Medium to Good' WQI category in Wardha (8% to 4%) and Wainganga (12% to 7%) in 2019-20.

In case of Wardha sub basin, no observation was rcorded under 'Bad' and 'Bad to Very Bad' WQI category while Wainganga sub basin recorded 3% and 14.5% observations in 'Bad' and 'Bad to very Bad' WQI category respectively. Both categories recorded dip in observations as compared to previous year (2018-19).

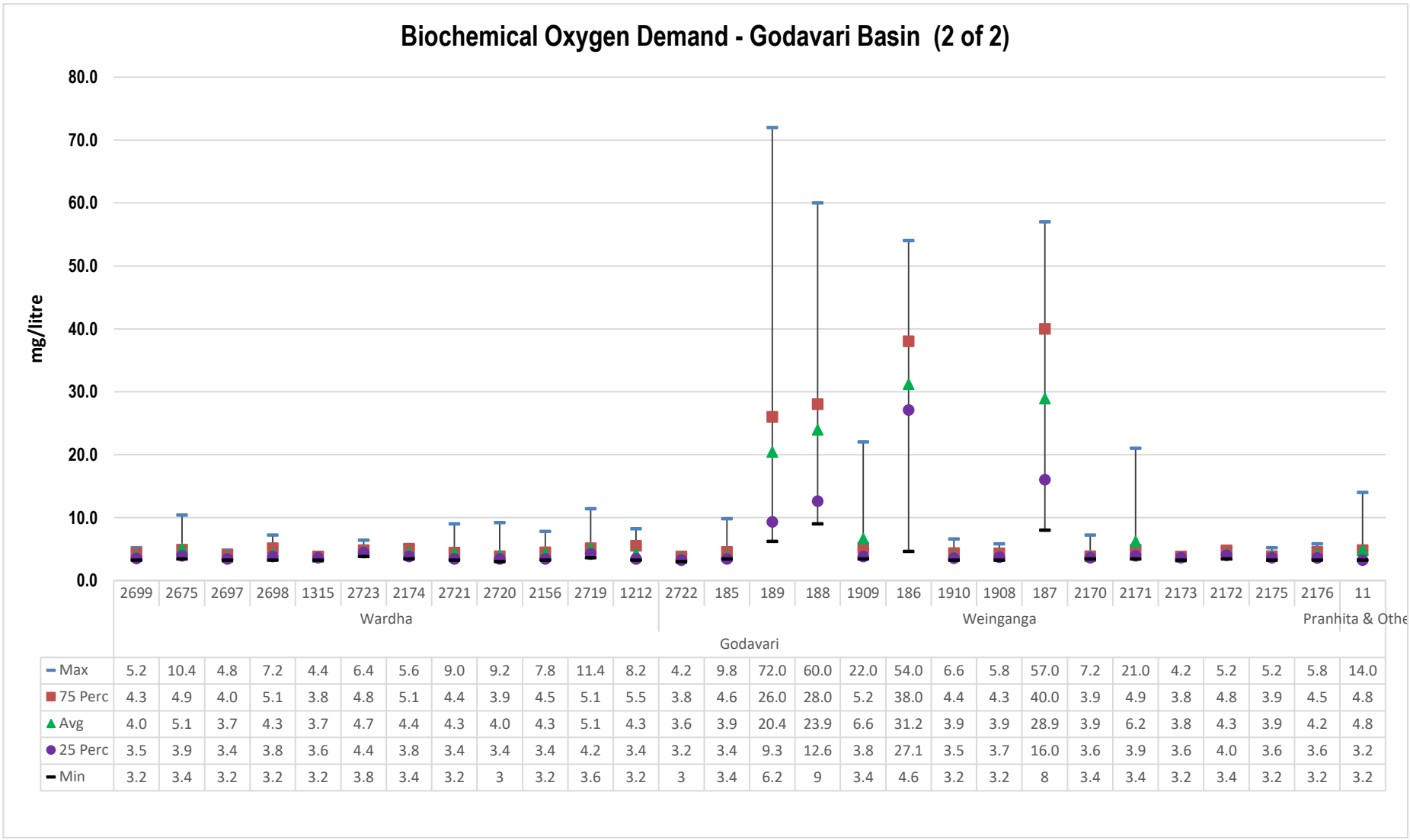
Pranhita and Others sub basin recorded around 92% observations in 'Good to Excellent' while 8% in 'Medium to Good'WQI category.

'Dry' category observations were recorded only at Wardha (16%) and Wainganga (12%).



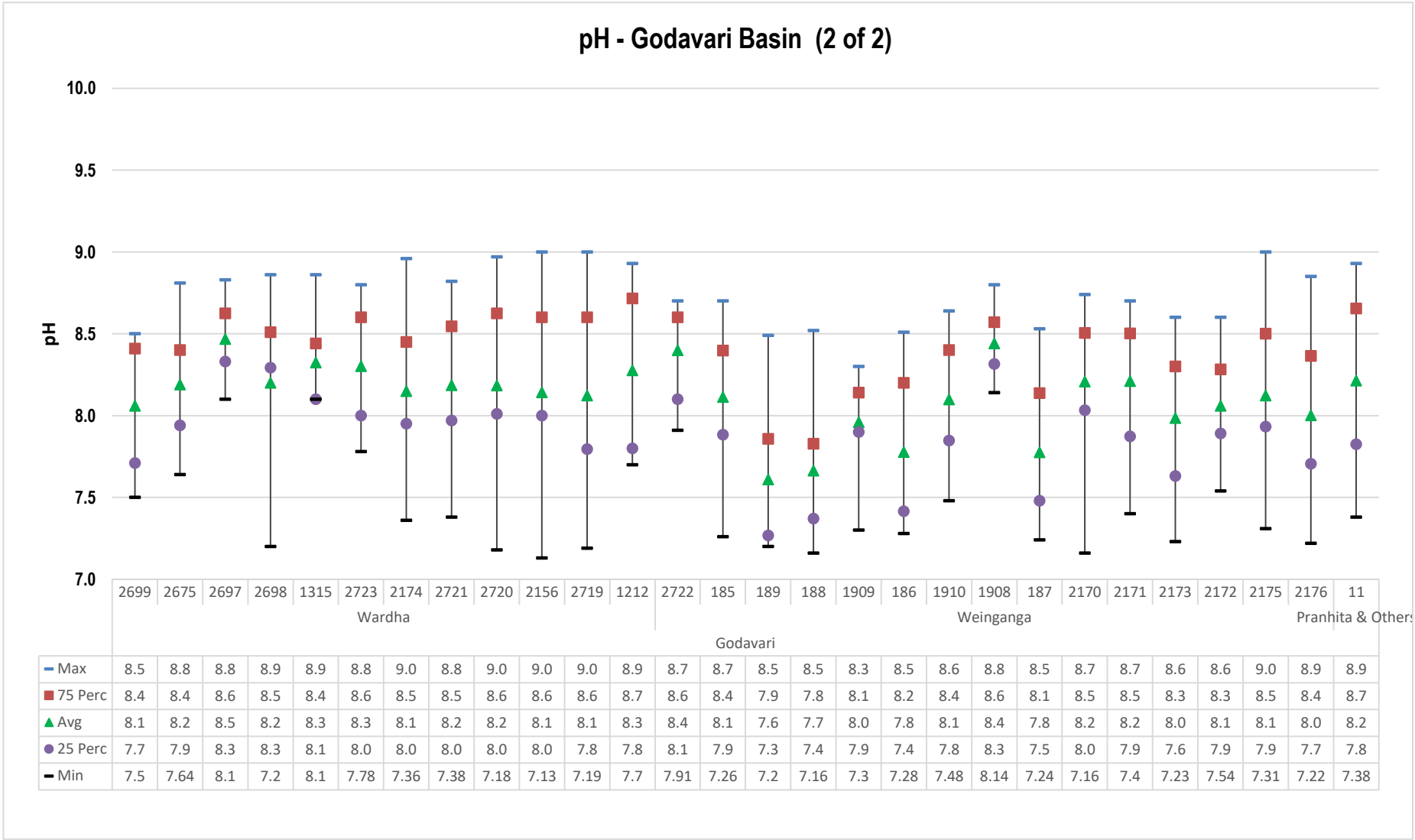
	2699	2675	2697	2698	1315	2723	2174	2721	2720	2156	2719	1212	2722	185	189	188	1909	186	1910	1908	187	2170	2171	2173	2172	2175	2176	11
Max	8.0	8.0	8.2	8.0	8.2	8.0	7.9	8.3	8.1	8.5	8.0	8.3	8.0	8.0	5.8	5.2	8.0	4.8	8.5	8.2	4.7	8.6	8.2	8.2	7.8	8.0	8.4	8.2
75 Perc	7.9	7.0	8.1	7.3	7.9	7.6	7.6	7.9	7.7	7.8	7.4	7.9	7.8	7.8	5.6	5.2	7.4	3.3	7.7	7.8	4.7	7.7	7.4	7.8	7.7	7.8	7.6	7.9
Avg	7.4	6.4	7.6	7.1	7.2	6.6	7.1	7.4	7.2	7.3	7.0	7.3	7.3	7.4	4.4	4.1	6.4	2.8	7.4	7.5	3.1	7.3	6.8	7.4	7.3	7.5	7.5	7.3
25 Perc	7.1	6.2	7.3	6.8	6.4	5.8	6.6	7.1	7.0	7.0	6.9	7.2	7.4	7.4	3.6	3.4	6.9	1.8	7.0	7.1	2.0	7.2	6.9	7.4	7.0	7.0	7.1	7.3
Min	6.02	4	6.1	5.26	6.3	5.29	5.43	4.64	3.94	5	3	4.06	5.03	4.21	2.4	2	1.8	1.8	3.87	4.27	0.84	3.44	4.33	6.2	4.49	5.75	4.81	4.34

Figure No. 18: Trend of Dissolved Oxygen (DO) levels recorded at WQMS at Godavari basin (2 of 2)



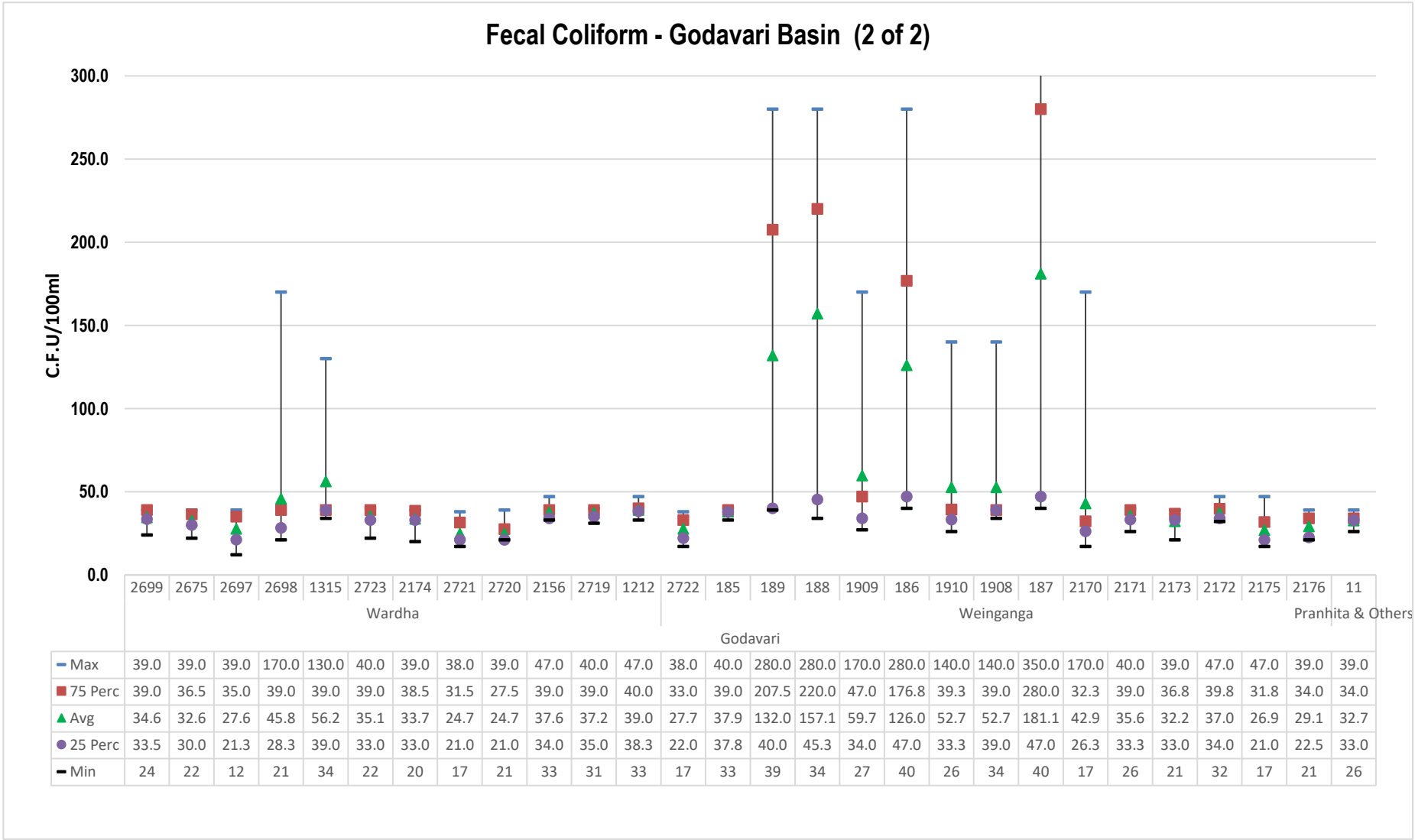
	2699	2675	2697	2698	1315	2723	2174	2721	2720	2156	2719	1212	2722	185	189	188	1909	186	1910	1908	187	2170	2171	2173	2172	2175	2176	11
Max	5.2	10.4	4.8	7.2	4.4	6.4	5.6	9.0	9.2	7.8	11.4	8.2	4.2	9.8	72.0	60.0	22.0	54.0	6.6	5.8	57.0	7.2	21.0	4.2	5.2	5.2	5.8	14.0
75 Perc	4.3	4.9	4.0	5.1	3.8	4.8	5.1	4.4	3.9	4.5	5.1	5.5	3.8	4.6	26.0	28.0	5.2	38.0	4.4	4.3	40.0	3.9	4.9	3.8	4.8	3.9	4.5	4.8
Avg	4.0	5.1	3.7	4.3	3.7	4.7	4.4	4.3	4.0	4.3	5.1	4.3	3.6	3.9	20.4	23.9	6.6	31.2	3.9	3.9	28.9	3.9	6.2	3.8	4.3	3.9	4.2	4.8
25 Perc	3.5	3.9	3.4	3.8	3.6	4.4	3.8	3.4	3.4	3.4	4.2	3.4	3.2	3.4	9.3	12.6	3.8	27.1	3.5	3.7	16.0	3.6	3.9	3.6	4.0	3.6	3.6	3.2
Min	3.2	3.4	3.2	3.2	3.2	3.8	3.4	3.2	3	3.2	3.6	3.2	3	3.4	6.2	9	3.4	4.6	3.2	3.2	8	3.4	3.4	3.2	3.4	3.2	3.2	3.2

Figure No. 19: Trend of Biological Oxygen Demand (BOD) levels recorded at WQMS at Godavari basin (2 of 2)



	2699	2675	2697	2698	1315	2723	2174	2721	2720	2156	2719	1212	2722	185	189	188	1909	186	1910	1908	187	2170	2171	2173	2172	2175	2176	11
	Wardha												Weinganga														Pranhita & Others	
	Godavari																											
Max	8.5	8.8	8.8	8.9	8.9	8.8	9.0	8.8	9.0	9.0	9.0	8.9	8.7	8.7	8.5	8.5	8.3	8.5	8.6	8.8	8.5	8.7	8.7	8.6	8.6	9.0	8.9	8.9
75 Perc	8.4	8.4	8.6	8.5	8.4	8.6	8.5	8.5	8.6	8.6	8.6	8.7	8.6	8.4	7.9	7.8	8.1	8.2	8.4	8.6	8.1	8.5	8.5	8.3	8.3	8.5	8.4	8.7
Avg	8.1	8.2	8.5	8.2	8.3	8.3	8.1	8.2	8.2	8.1	8.1	8.3	8.4	8.1	7.6	7.7	8.0	7.8	8.1	8.4	7.8	8.2	8.2	8.0	8.1	8.1	8.0	8.2
25 Perc	7.7	7.9	8.3	8.3	8.1	8.0	8.0	8.0	8.0	8.0	7.8	7.8	8.1	7.9	7.3	7.4	7.9	7.4	7.8	8.3	7.5	8.0	7.9	7.6	7.9	7.9	7.7	7.8
Min	7.5	7.64	8.1	7.2	8.1	7.78	7.36	7.38	7.18	7.13	7.19	7.7	7.91	7.26	7.2	7.16	7.3	7.28	7.48	8.14	7.24	7.16	7.4	7.23	7.54	7.31	7.22	7.38

Figure No. 20: Trend of pH levels recorded at WQMS at Godavari basin (2 of 2)



	2699	2675	2697	2698	1315	2723	2174	2721	2720	2156	2719	1212	2722	185	189	188	1909	186	1910	1908	187	2170	2171	2173	2172	2175	2176	11
	Wardha												Godavari						Weinganga									Pranhita & Others	
Max	39.0	39.0	39.0	170.0	130.0	40.0	39.0	38.0	39.0	47.0	40.0	47.0	38.0	40.0	280.0	280.0	170.0	280.0	140.0	140.0	350.0	170.0	40.0	39.0	47.0	47.0	39.0	39.0
75 Perc	39.0	36.5	35.0	39.0	39.0	39.0	38.5	31.5	27.5	39.0	39.0	40.0	33.0	39.0	207.5	220.0	47.0	176.8	39.3	39.0	280.0	32.3	39.0	36.8	39.8	31.8	34.0	34.0
Avg	34.6	32.6	27.6	45.8	56.2	35.1	33.7	24.7	24.7	37.6	37.2	39.0	27.7	37.9	132.0	157.1	59.7	126.0	52.7	52.7	181.1	42.9	35.6	32.2	37.0	26.9	29.1	32.7
25 Perc	33.5	30.0	21.3	28.3	39.0	33.0	33.0	21.0	21.0	34.0	35.0	38.3	22.0	37.8	40.0	45.3	34.0	47.0	33.3	39.0	47.0	26.3	33.3	33.0	34.0	21.0	22.5	33.0
Min	24	22	12	21	34	22	20	17	21	33	31	33	17	33	39	34	27	40	26	34	40	17	26	21	32	17	21	26

Figure No. 21: Trend of Fecal Coliform levels recorded at WQMS at Godavari basin (2 of 2)

Water Quality Index for WQMS at Godavari Basin (2 of 2): Sub-basin- Wardha

Apr	Dry	Dry	75	66	Dry	Dry	74	70	59	68	53	60
May	Dry	Dry	71	67	Dry	Dry	68	70	70	66	67	63
Jun	Dry	Dry	78	76	Dry	Dry	Dry	Dry	75	Dry	72	58
Jul	Dry	Dry	75	77	Dry	71	75	77	78	74	75	71
Aug	78	77	73	70	77	68	77	68	69	71	69	77
Sep	76	79	78	82	69	77	76	82	78	77	76	76
Oct	74	70	74	74	74	74	77	77	82	74	77	73
Nov	72	77	69	70	67	68	69	71	69	67	70	68
Dec	72	54	69	73	75	71	75	74	71	73	71	70
Jan	70	72	70	68	Dry	70	72	70	71	70	71	70
Feb	76	73	70	72	Dry	72	73	68	73	73	72	76
Mar	Dry	Dry	70	71	Dry	69	71	70	72	73	72	72
Station Code	2699	2675	2697	2698	1315	2723	2174	2721	2720	2156	2719	1212
Sub Basin	Wardha											
Basin	Godavari											

Legend

Good to Excellent	Medium to good	Bad	Bad to Very Bad	Dry	NA

Table No. 19: Surface water quality monitoring stations in Godavari Basin (2 of 2)

Program	Station ID	River/Nalla	Station Name	Village	Taluka	District
NWMP	2699	Penganga	Penganga at Mehkar-Buldana Road Bridge	Mehkar	Mehkar	Buldana
NWMP	2675	Morna	Morna at D/s of Railway Bridge	Akola	Akola	Akola
NWMP	2697	Penganga	Penganga near water supply scheme of Umarkhed MC	Belkhed	Umarkhed	Yavatmal
NWMP	2698	Penganga	Penganga D/s of Isapur Dam	Isapur	Pusad	Yavatmal
NWMP	1315	Wardha	Wardha at Pulgaon Railway Bridge	Pulgaon	wardha	Wardha
NWMP	2723	Wena	Wena at D/s of Mohata Mills, near Bridge on Hinganghat-Wadner Road	Hinganghat	Hinganghat	Wardha
NWMP	2174	Wardha	Wardha at D/s of ACC Ghuggus	Ghuggus	Chandrapur	Chandrapur
NWMP	2721	Wardha	Wardha at U/s of ACC Ghuggus	Ghuggus	Chandrapur	Chandrapur
NWMP	2720	Wardha	Wardha at U/s of Erai	Hadasti	Chandrapur	Chandrapur
NWMP	2156	Wardha	Wardha at confluence point of Penganga & Wardha	Jugad	Wani	Yavatmal
NWMP	2719	Wardha	Wardha at D/s of Erai	Hadasti	Chandrapur	Chandrapur
NWMP	1212	Wardha	Wardha at Rajura bridge	Rajura	Chandrapur	Chandrapur

Water Quality Index for WQMS at Godavari Basin (2 of 2): Sub-basin- Wainganga and Pranhita

Apr	Dry	63	37	36	Dry	35	63	61	35	58	77	78	67	73	67	63
May	Dry	67	34	52	Dry	30	69	Dry	31	69	67	Dry	Dry	68	69	69
Jun	Dry	Dry	29	29	Dry	29	74	Dry	29	74	73	Dry	Dry	76	75	70
Jul	68	74	54	Dry	42	Dry	76	Dry	54	74	74	80	78	75	75	75
Aug	77	Dry	Dry	Dry	59	Dry	74	Dry	33	77	74	80	75	82	79	59
Sep	77	73	68	61	76	65	75	68	56	69	59	81	77	73	76	81
Oct	73	75	31	30	70	37	71	74	38	75	76	75	74	77	78	76
Nov	71	78	65	59	72	31	71	72	32	71	71	75	74	75	78	69
Dec	71	72	70	63	74	42	78	71	56	74	71	75	74	72	72	69
Jan	71	68	44	42	80	31	74	71	32	69	71	70	71	73	73	71
Feb	73	76	34	32	75	36	71	70	29	73	71	72	72	73	72	72
Mar	71	70	Dry	30	72	31	71	70	32	72	72	70	69	73	72	71
Station Code	2722	185	189	188	1909	186	1910	1908	187	2170	2171	2173	2172	2175	2176	11
Sub Basin	Weinganga															Pranhita & Others
Basin	Godavari															

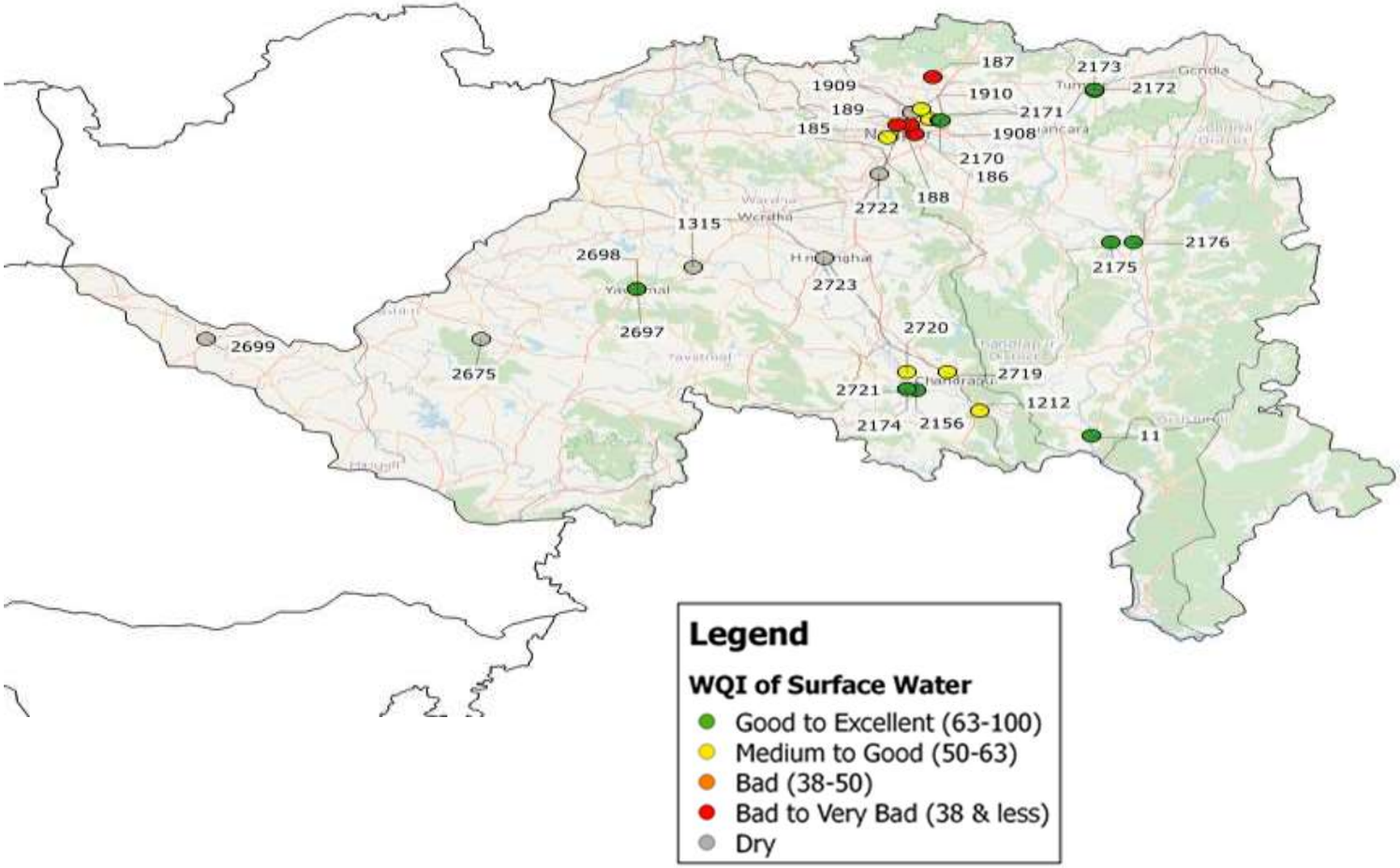
Legend

Good to Excellent	Medium to good	Bad	Bad to Very Bad	Dry	NA

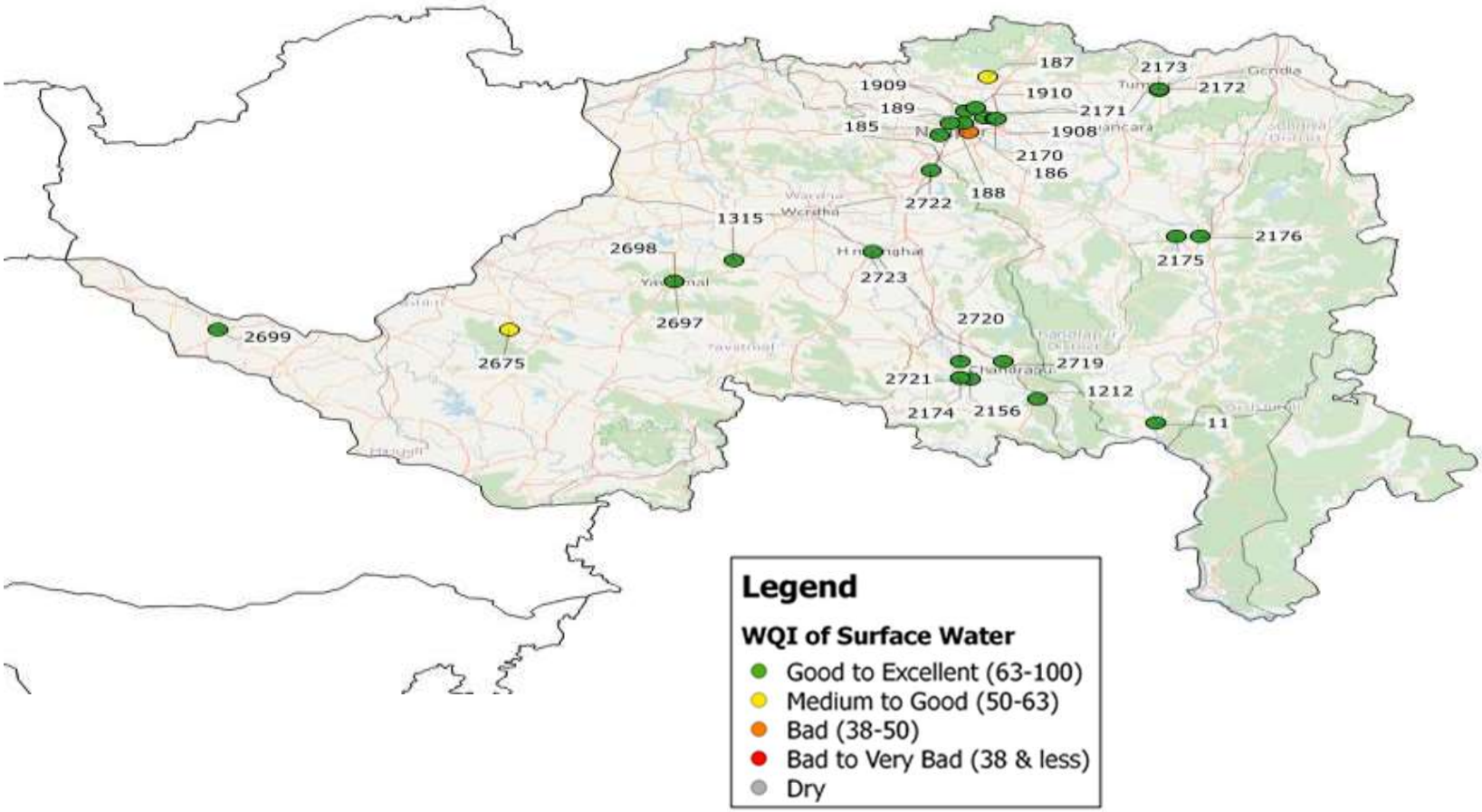
Table No. 20: Surface water quality monitoring stations in Godavari Basin (2 of 2)

Program	Station ID	River/nalla	Station Name	Village	Taluka	District
NWMP	2722	Wena	Wena at U/s of Mohata Mills, nearby Brigde on Hinganghat Wadner Road	Hinganghat	Hinganghat	Wardha
SWMP	185	Nag	Nag Near, Ambazari Lake, Nagpur	Nagpur	Nagpur	Nagpur
SWMP	189	Pill	Pill Near, Mankapur on Koradi Road, Nagpur	Nagpur	Nagpur	Nagpur
SWMP	188	Pill	Pill Near, Wanjra Layout Kamptee Road, Nagpur	Nagpur	Nagpur	Nagpur
NWMP	1909	Kanhan	Kanhan at D/s of Nagpur	Agargaon	Kuhi	Nagpur
SWMP	186	Nag	Nag Near, Bhandewadi Bridge, Nagpur	Nagpur	Nagpur	Nagpur
NWMP	1910	Wainganga	Wainganga after confluence with Kanhan	Ambhora	Kuhi	Nagpur
NWMP	1908	Kolar	Kolar before confluence with Kanhan at Waregaon Bridge	Waregaon	Kamptee	Nagpur
SWMP	187	Nag	Nag Near, Asoli Bridge, Bhandara Road, Nagpur	Nagpur	Nagpur	Nagpur
NWMP	2170	Kanhan	Kanhan (Wainganga basin) at U/s of M/s Vidharba Paper Mill	Sinora	Parseoni	Nagpur
NWMP	2171	Kanhan	Kanhan (Wainganga basin) at D/s of M/s Vidharbha Paper Mills	Sinora	Parseoni	Nagpur
NWMP	2173	Wainganga	Wainganga at U/s of Ellora Paper Mills	Tumsar	Tumsar	Bandara
NWMP	2172	Wainganga	Wainganga at D/s of Ellora Paper Mill	Tumsar	Tumsar	Bandara
NWMP	2175	Wainganga	Wainganga at U/s of Gaurav Paper Mills near Jack Well	Bramhpuri	Chandrapur	Chandrapur
NWMP	2176	Wainganga	Wainganga at D/s of Gaurav Paper Mills Near Jackwell	Bramhpuri	Chandrapur	Chandrapur
NWMP	11	Wainganga	Wainganga at Ashti	Ashti	Gondpipri	Chandrapur

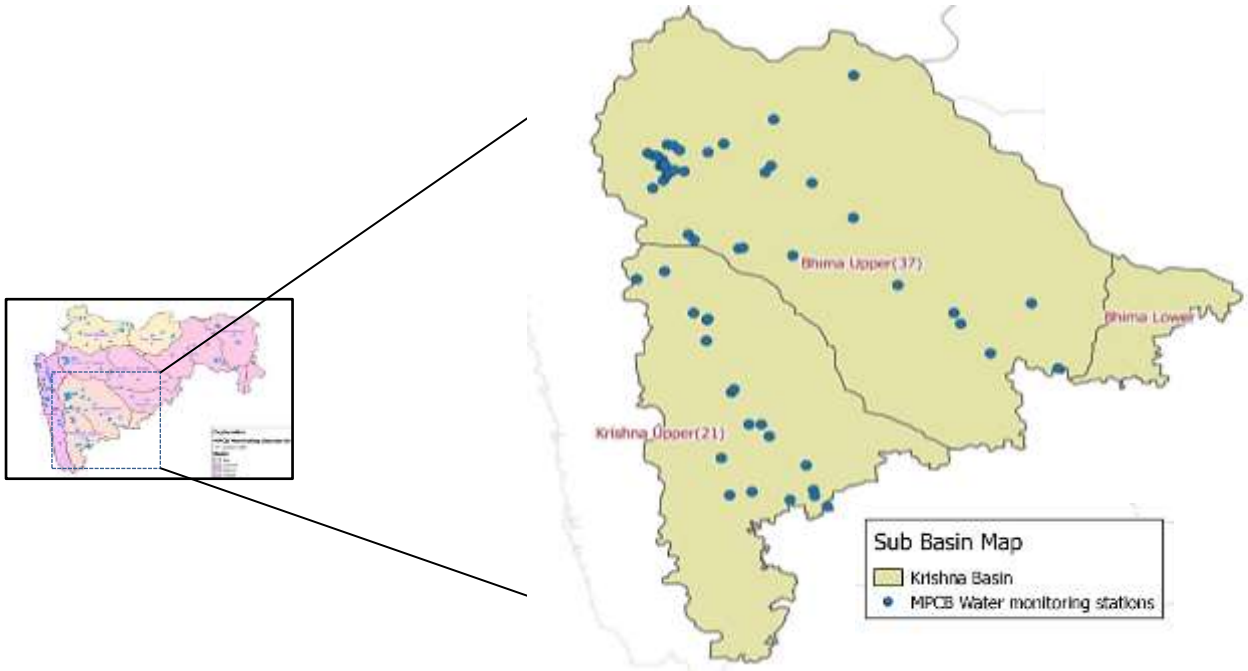
Spatial map of Surface WQI in Godavari Basin (2 of 2) (April 2019)



Spatial map of Surface WQI in Godavari Basin (2 of 2) (December 2019)



Krishna Basin

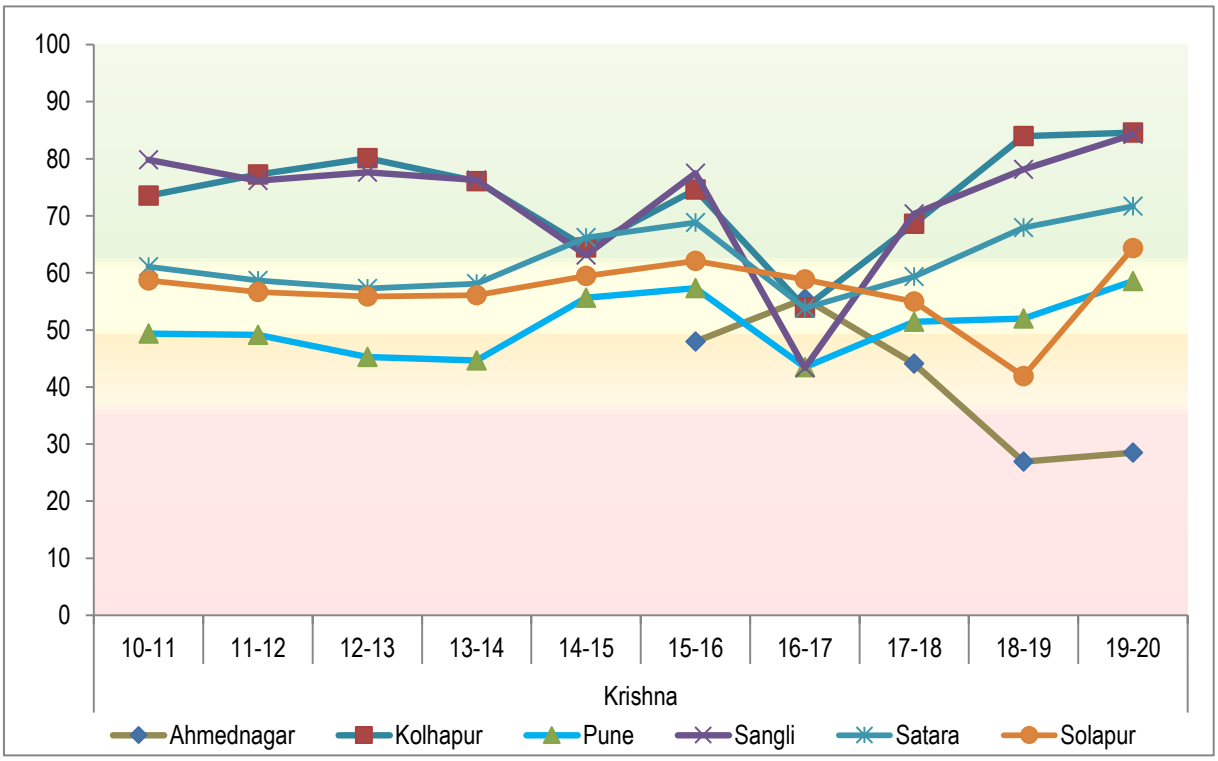


Map No. 7: Network of surface water quality monitoring stations in Krishna basin

Krishna River, the 2nd largest eastward draining river in Peninsular India; rises in Mahadev range of Western ghats at an altitude of 1337 meters near Mahabaleshwar; about 64 km from the Arabian Sea in Maharashtra. Total drainage area is about 2,58,948 sq.km distributed in states of Maharashtra (26.8%), Karnataka (43.7%) and Andhra Pradesh (29.4%). The length of the river is about 1400km which drains the Deccan plateau and discharges into the Bay of Bengal[24]. Its major tributaries are the Ghataprabha, the Malaprabha, the Bhima, the Tungbhadra, the Munneru and the Musi River. The Krishna basin is divided into Krishna Upper (21 stations) and Bhima Upper (37 stations) for analysis in this report

[24] http://117.252.14.242/rbis/basin%20maps/krishna_about.htm

Krishna Basin (Intra and Inter Basin analysis)



WQI	Category	Class by CPCB	Remarks
63-100	Good to Excellent	A	Non polluted
50-63	Medium to Good	B	Non polluted
38-50	Bad	C	Polluted
38 & less	Bad to Very Bad	D, E	Heavily polluted

Figure No. 22: Trend of annual average WQI across districts of Krishna basin

Note: This graph considers the average WQI for all the monitoring stations in that particular district and hence may include some bias. This graph is only for an overview and monitoring station wise data maybe analyzed to pin point the most affected and polluted patches of rivers in that district

There is an increasing trend in WQI was observed in Krishna basin spread across 6 districts (Figure No. 22). WQI recorded at districts namely Kolhapur, Sangli, Satara and Solapur was found to be in 'Good to Excellent' category while at Pune; though the WQI was found to be in 'Medium to Good' category, the WQI level has increased from 52 (2018-19) to 58.5 in 2019-20.

At Ahmednagar district however, though marginally increased; the WQI was found to be in 'Bad to Very Bad' category indicating the deteriorated water quality. This is an indication of increased pollution level in this specific part of the basin.

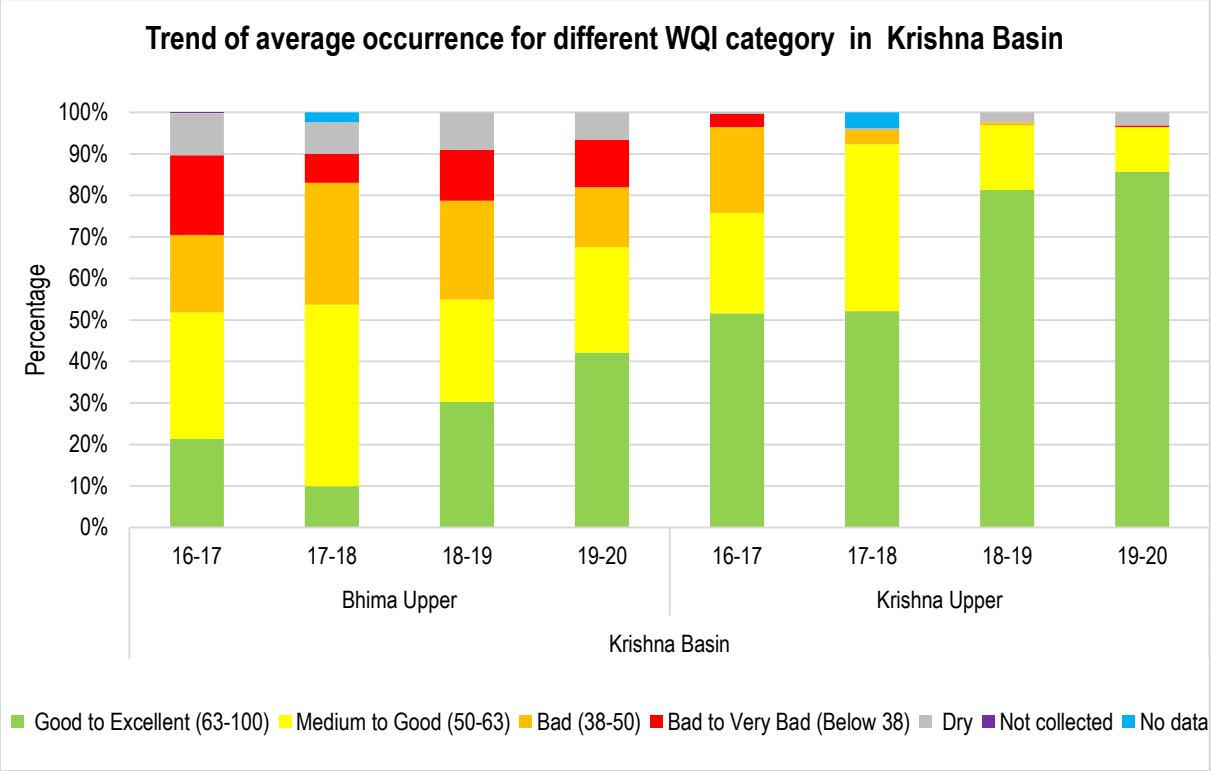
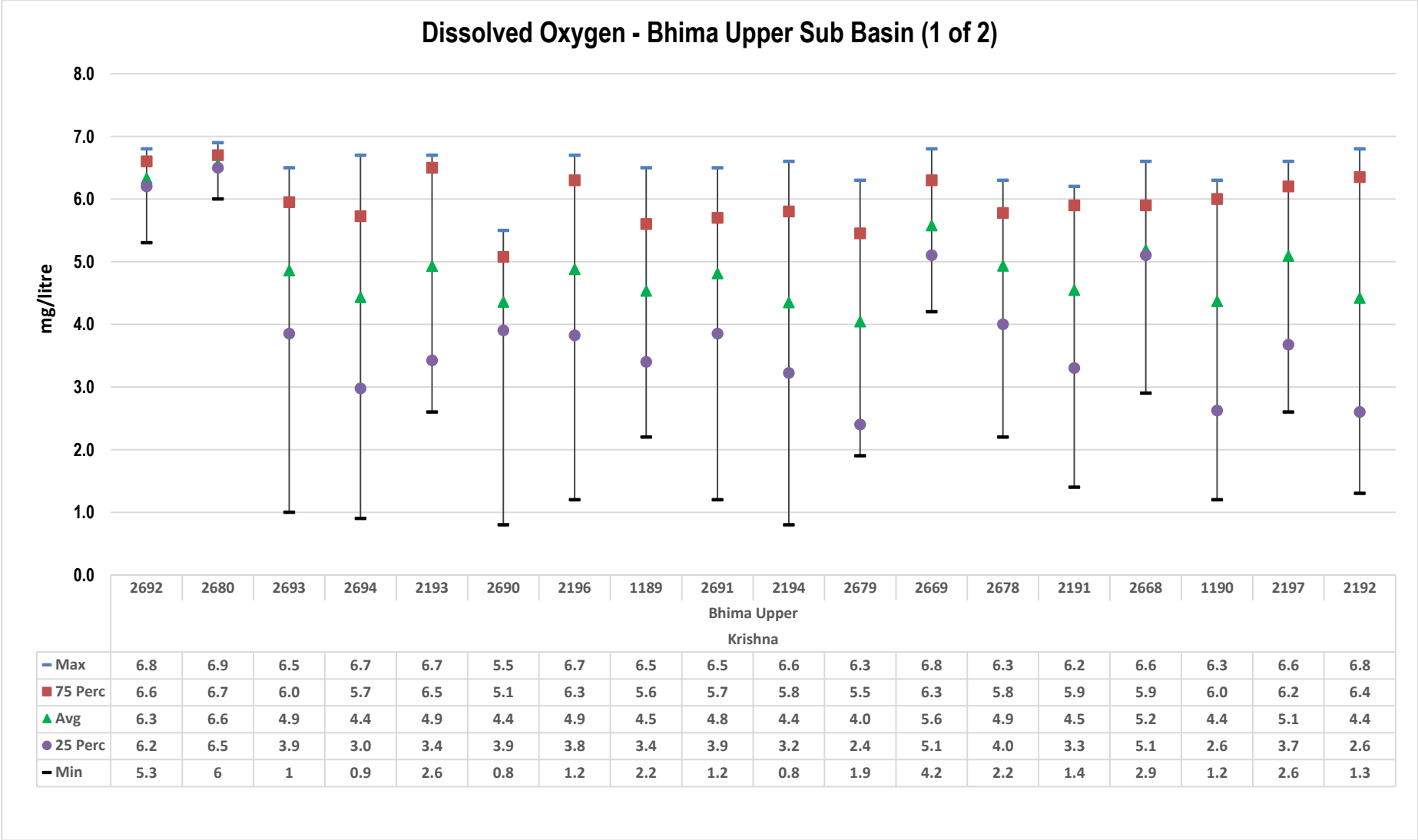


Figure No. 23: Trend of average occurrence for different category of WQI in Krishna basin

Interbasin analysis for Krishna basin has been depicted in Figure No. 23. In 2019-20, Bhima Upper sub basin, recorded increasing trend in case of observations recorded under both 'Good to Excellent' (from 30% to 42%) and 'Medium to Good' (from 24% to 25%). In the same year (2019-20), a decreasing trend was observed in case of observations coming under 'Bad' category (from 24% to 14%) and 'Bad to Very Bad' category (12% to 11%). It shows improvement in overall water quality and decrease in pollution levels in Bhima Upper sub basin region.

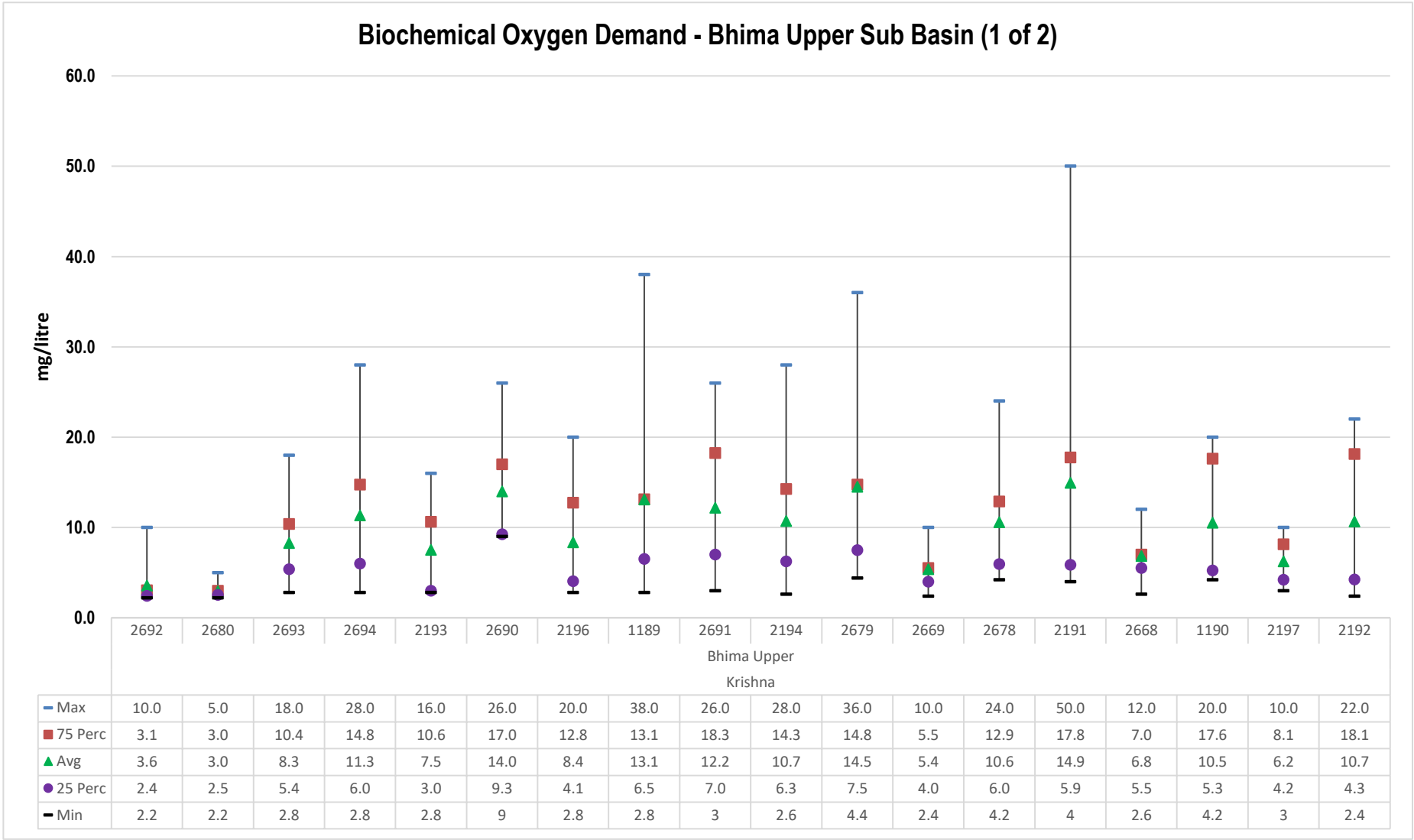
Just like Bhima Upper, Krishna Upper sub basin region too recorded improvement in water quality as around 86% of the total observations were recorded under 'Good to Excellent' category while 11% observations were recorded under the 'Medium to Good' category. Only about 0.4% of the observations were recorded under the 'Bad to Very Bad' category.

In case of 'Dry' category, Bhima Upper and Krishna Upper recorded around 6.5% and 3% observations respectively.



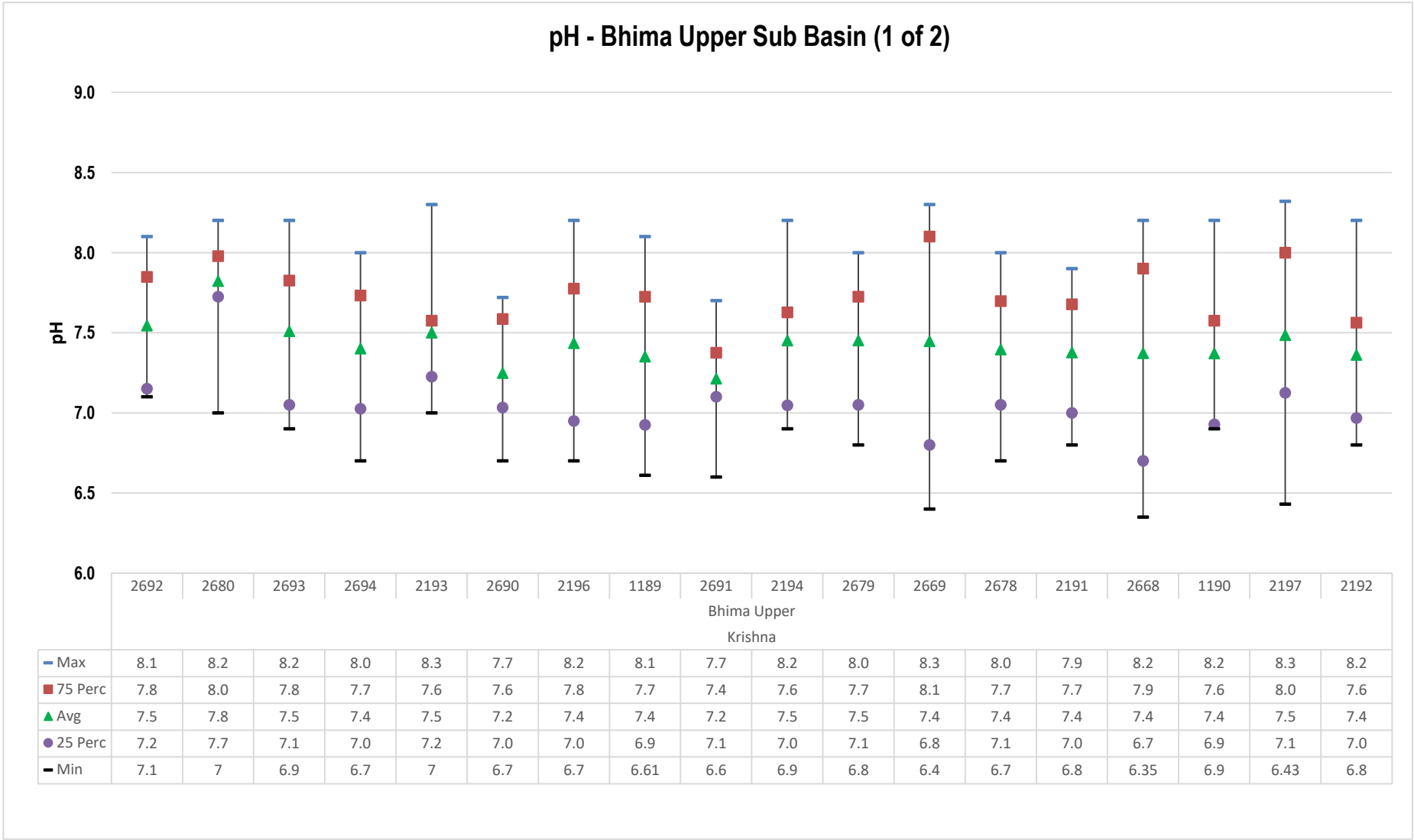
	2692	2680	2693	2694	2193	2690	2196	1189	2691	2194	2679	2669	2678	2191	2668	1190	2197	2192
	Bhima Upper Krishna																	
Max	6.8	6.9	6.5	6.7	6.7	5.5	6.7	6.5	6.5	6.6	6.3	6.8	6.3	6.2	6.6	6.3	6.6	6.8
75 Perc	6.6	6.7	6.0	5.7	6.5	5.1	6.3	5.6	5.7	5.8	5.5	6.3	5.8	5.9	5.9	6.0	6.2	6.4
Avg	6.3	6.6	4.9	4.4	4.9	4.4	4.9	4.5	4.8	4.4	4.0	5.6	4.9	4.5	5.2	4.4	5.1	4.4
25 Perc	6.2	6.5	3.9	3.0	3.4	3.9	3.8	3.4	3.9	3.2	2.4	5.1	4.0	3.3	5.1	2.6	3.7	2.6
Min	5.3	6	1	0.9	2.6	0.8	1.2	2.2	1.2	0.8	1.9	4.2	2.2	1.4	2.9	1.2	2.6	1.3

Figure No. 24: Trend of Dissolved Oxygen (DO) levels recorded at WQMS at Bhima upper sub basin -Krishna Basin (1 of 2)



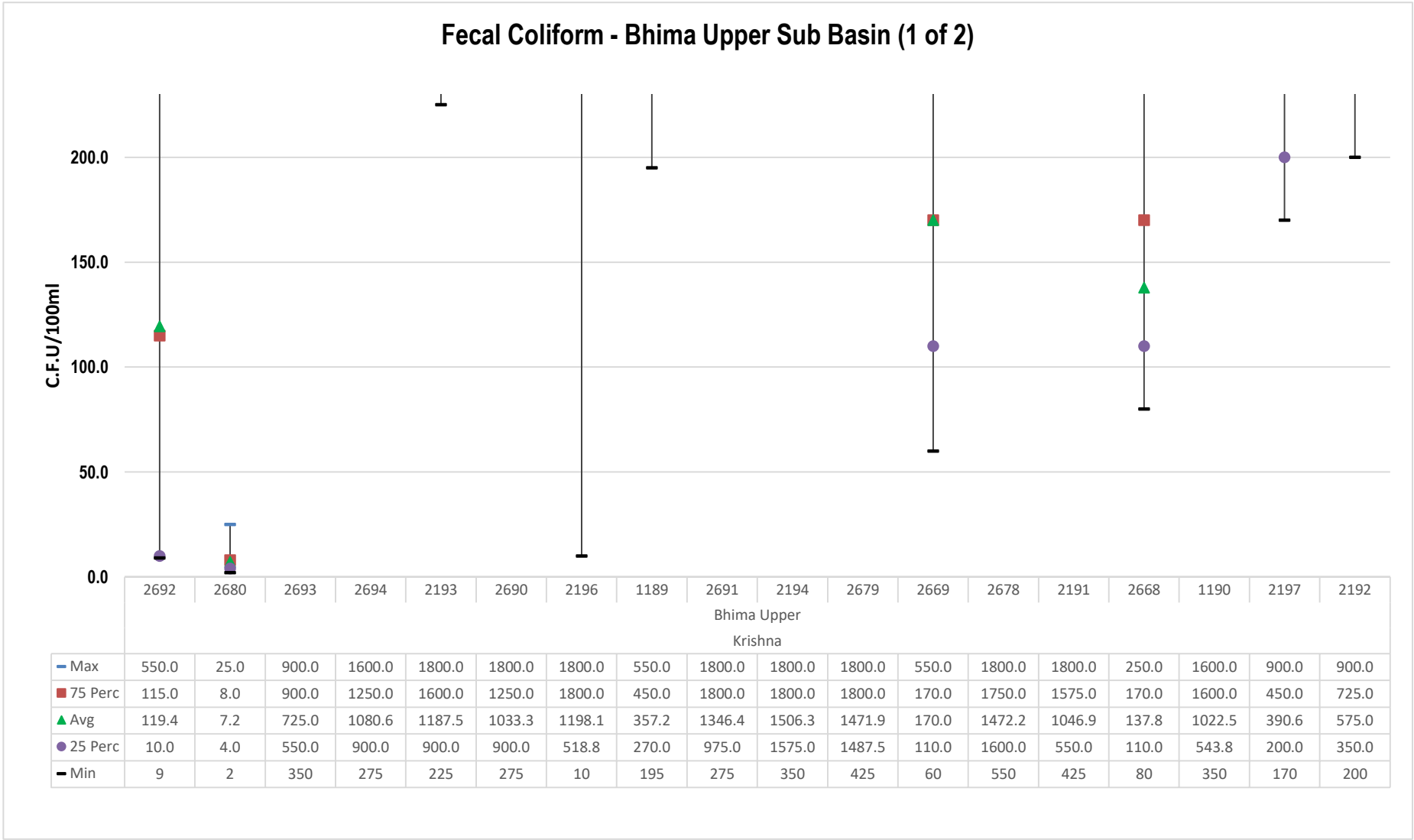
	2692	2680	2693	2694	2193	2690	2196	1189	2691	2194	2679	2669	2678	2191	2668	1190	2197	2192
	Bhima Upper Krishna																	
Max	10.0	5.0	18.0	28.0	16.0	26.0	20.0	38.0	26.0	28.0	36.0	10.0	24.0	50.0	12.0	20.0	10.0	22.0
75 Perc	3.1	3.0	10.4	14.8	10.6	17.0	12.8	13.1	18.3	14.3	14.8	5.5	12.9	17.8	7.0	17.6	8.1	18.1
Avg	3.6	3.0	8.3	11.3	7.5	14.0	8.4	13.1	12.2	10.7	14.5	5.4	10.6	14.9	6.8	10.5	6.2	10.7
25 Perc	2.4	2.5	5.4	6.0	3.0	9.3	4.1	6.5	7.0	6.3	7.5	4.0	6.0	5.9	5.5	5.3	4.2	4.3
Min	2.2	2.2	2.8	2.8	2.8	9	2.8	2.8	3	2.6	4.4	2.4	4.2	4	2.6	4.2	3	2.4

Figure No. 25: Trend of Biological Oxygen Demand (BOD) levels recorded at WQMS at Bhima upper sub basin -Krishna Basin (1 of 2)



	2692	2680	2693	2694	2193	2690	2196	1189	2691	2194	2679	2669	2678	2191	2668	1190	2197	2192
	Bhima Upper Krishna																	
Max	8.1	8.2	8.2	8.0	8.3	7.7	8.2	8.1	7.7	8.2	8.0	8.3	8.0	7.9	8.2	8.2	8.3	8.2
75 Perc	7.8	8.0	7.8	7.7	7.6	7.6	7.8	7.7	7.4	7.6	7.7	8.1	7.7	7.7	7.9	7.6	8.0	7.6
Avg	7.5	7.8	7.5	7.4	7.5	7.2	7.4	7.4	7.2	7.5	7.5	7.4	7.4	7.4	7.4	7.4	7.5	7.4
25 Perc	7.2	7.7	7.1	7.0	7.2	7.0	7.0	6.9	7.1	7.0	7.1	6.8	7.1	7.0	6.7	6.9	7.1	7.0
Min	7.1	7	6.9	6.7	7	6.7	6.7	6.61	6.6	6.9	6.8	6.4	6.7	6.8	6.35	6.9	6.43	6.8

Figure No. 26: Trend of pH levels recorded at WQMS at Bhima upper sub basin -Krishna Basin (1 of 2)



	2692	2680	2693	2694	2193	2690	2196	1189	2691	2194	2679	2669	2678	2191	2668	1190	2197	2192
	Bhima Upper																	
	Krishna																	
Max	550.0	25.0	900.0	1600.0	1800.0	1800.0	1800.0	550.0	1800.0	1800.0	1800.0	550.0	1800.0	1800.0	250.0	1600.0	900.0	900.0
75 Perc	115.0	8.0	900.0	1250.0	1600.0	1250.0	1800.0	450.0	1800.0	1800.0	1800.0	170.0	1750.0	1575.0	170.0	1600.0	450.0	725.0
Avg	119.4	7.2	725.0	1080.6	1187.5	1033.3	1198.1	357.2	1346.4	1506.3	1471.9	170.0	1472.2	1046.9	137.8	1022.5	390.6	575.0
25 Perc	10.0	4.0	550.0	900.0	900.0	900.0	518.8	270.0	975.0	1575.0	1487.5	110.0	1600.0	550.0	110.0	543.8	200.0	350.0
Min	9	2	350	275	225	275	10	195	275	350	425	60	550	425	80	350	170	200

Figure No. 27: Trend of Fecal Coliform levels recorded at WQMS at Bhima upper sub basin -Krishna Basin (1 of 2)

Water Quality Index for WQMS at Krishna Basin (1 of 2): Sub-basin - Bhima upper (1 of 2)

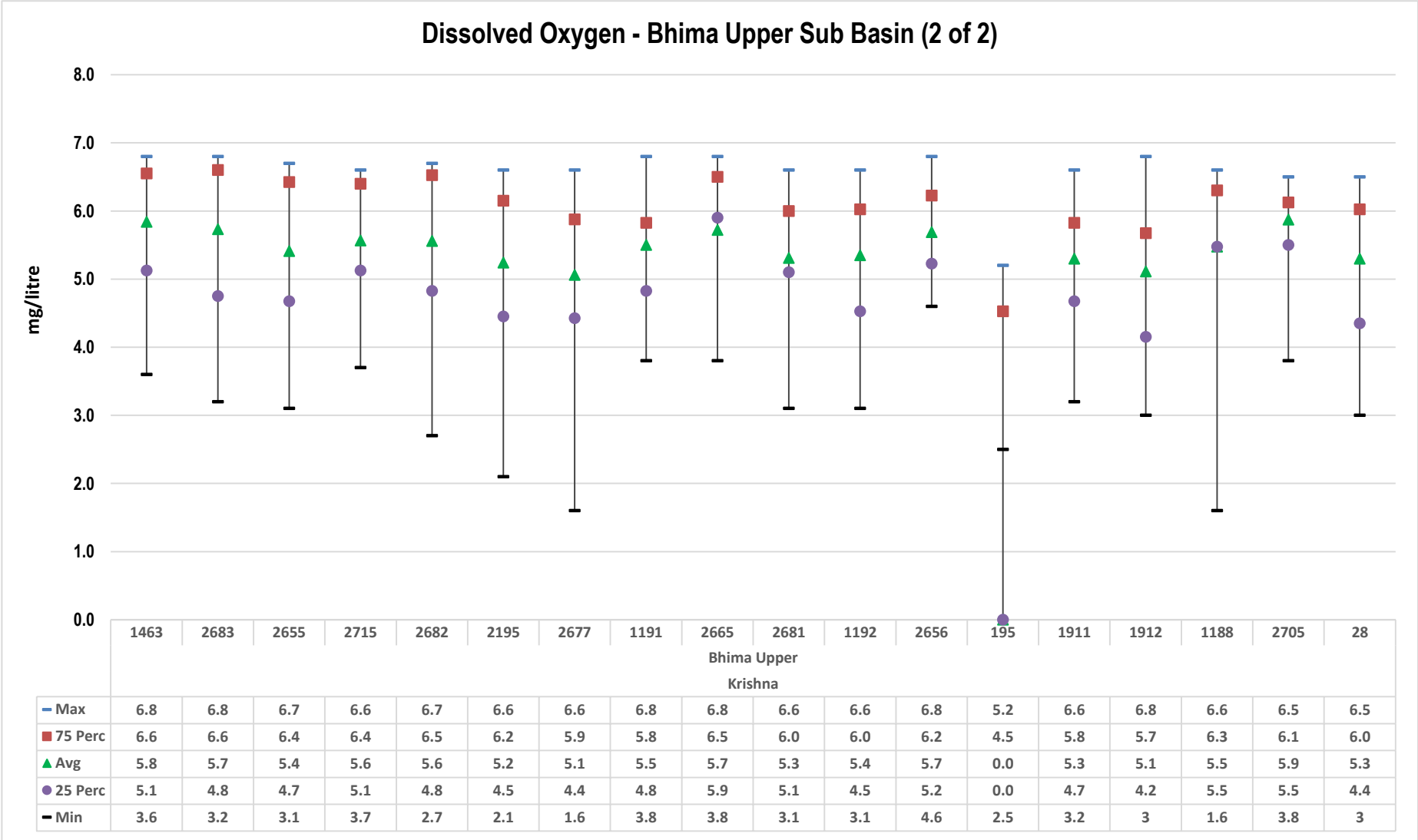
Apr	78	89	38	38	37	33	39	56	27	32	31	Dry	31	32	Dry	32	52	35
May	82	86	36	32	48	34	30	47	29	41	37	Dry	37	31	Dry	32	45	32
Jun	76	89	33	25	42	23	28	28	23	28	24	Dry	30	25	Dry	37	43	39
Jul	76	84	54	50	49	43	46	53	42	45	36	58	45	36	47	36	41	36
Aug	74	84	39	37	51	37	40	48	49	46	41	59	47	46	54	36	42	38
Sep	88	87	75	68	75	59	76	76	67	74	71	79	66	71	79	71	74	75
Oct	64	84	68	69	69	63	68	63	76	62	59	75	63	64	70	64	69	70
Nov	81	86	65	63	66	55	68	69	67	68	59	72	66	68	70	65	72	71
Dec	76	84	59	48	50	48	45	NA	48	NA	NA	62	NA	NA	59	46	58	44
Jan	86	84	60	55	51	53	55	50	Dry	42	43	73	58	53	69	55	78	55
Feb	79	82	48	37	53	45	81	48	47	49	45	63	51	57	66	51	64	50
Mar	86	89	62	64	71	54	62	64	57	62	56	60	58	61	59	64	63	59
Station Code	2692	2680	2693	2694	2193	2690	2196	1189	2691	2194	2679	2669	2678	2191	2668	1190	2197	2192
Sub Basin	Bhima Upper (1 of 2)																	
Basin	Krishna																	

Legend

Good to Excellent	Medium to good	Bad	Bad to Very Bad	Dry	NA

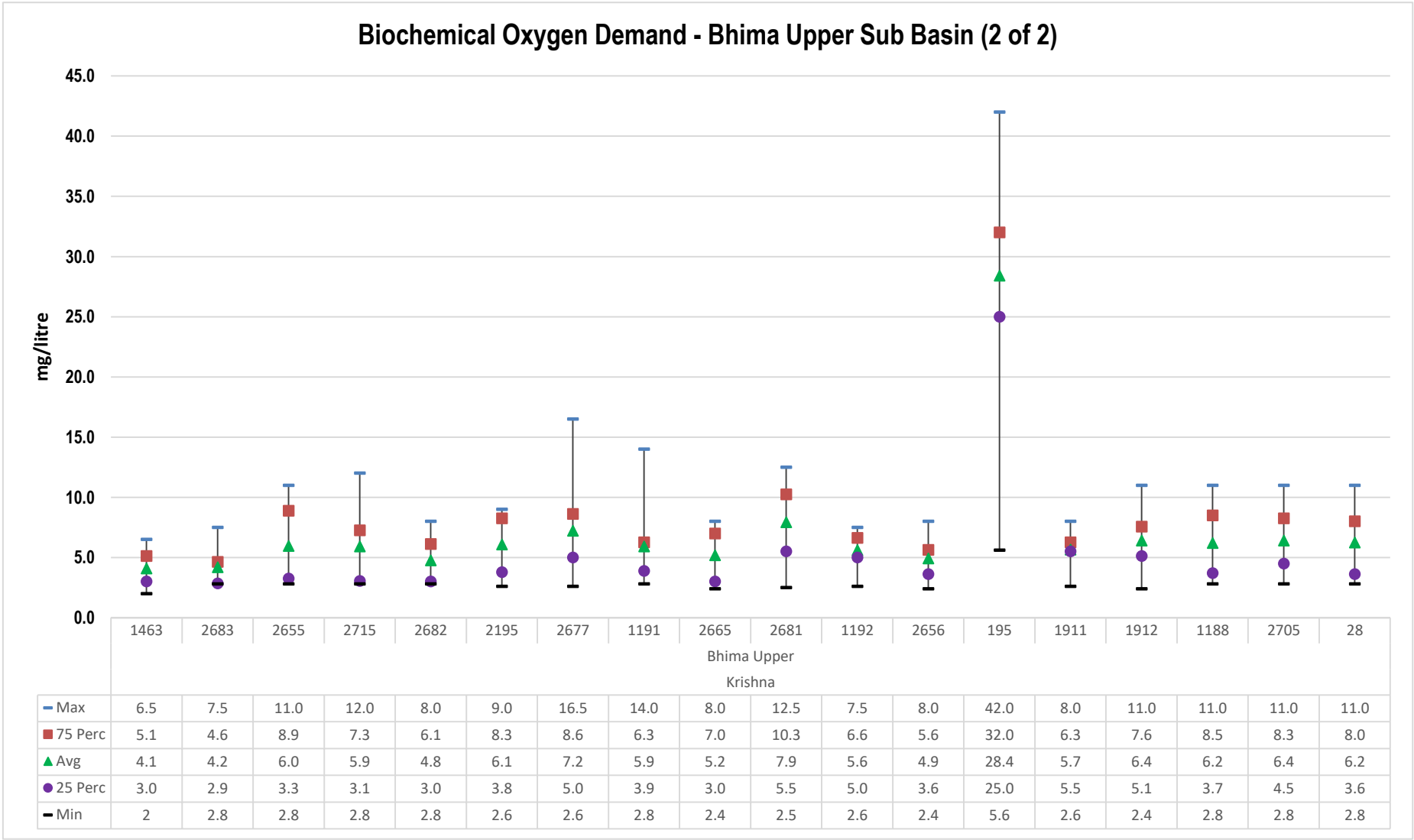
Table No. 21: Surface water quality monitoring stations in Krishna Basin (1 of 2) Sub Basin –Bhima Upper (1 of 2)

Program	Station ID	River/Nalla	Station Name	Village	Taluka	District
NWMP	2692	Pawana	Pawana at Ravet Weir, Pune	Ravet	Haweli	Pune
NWMP	2680	Mutha	Mutha at Khadakvasla Dam Pune	Kadakvasla	Haweli	Pune
NWMP	2693	Pawana	Pawana at Chinchwadgaon, Pune	Chinchwadgaon	Haweli	Pune
NWMP	2694	Pawana	Pawana at Pimprigaon, Pune	Pimprigaon	Haweli	Pune
NWMP	2193	Mula	Mula at Aundh Bridge -Aundgaon	Aundhgaon	Haweli	Pune
NWMP	2690	Pawana	Pawana at Kasarwadi Pune	Kasarwadi	Haweli	Pune
NWMP	2196	Pawana	Pawana at Sangavigaon, Pune	Sangavigaon	Haweli	Pune
NWMP	1189	Bhima	Bhima at Pune(Mutha) at U/s of Vithalwadi near Sankar Mandir	Vithalwadi	Haweli	Pune
NWMP	2691	Pawana	Pawana at Dapodi Bridge at Pawana-Mulla Sangan Pune	Dapodi	Haweli	Pune
NWMP	2194	Mula	Mula at Harrison Bridge near Mula -Pawana Sangam	Bopodi	Haweli	Pune
NWMP	2679	Mutha	Mutha at Deccan Bridge, Pune	Deccan	Pune	Pune
NWMP	2669	Indrayani	Indrayani at U/s of Moshigaon, Pune	Moshigaon	Haweli	Pune
NWMP	2678	Mutha	Mutha near Veer Savarkar Bhavan	Pune M.C	Pune	Pune
NWMP	2191	Mutha	Mutha at Sangam Bridge Near Ganpathi Ghat	Shivaji Nagar	Pune	Pune
NWMP	2668	Indrayani	Indrayani at D/s of Moshi village	Moshi	Haveli	Pune
NWMP	1190	Bhima	Bhima at D/s of Bundgarden, Pune	Yerwada	Haweli	Pune
NWMP	2197	Indrayani	Indrayani at D/s of Alandigaon, Pune	Alandigaon	Haweli	Pune
NWMP	2192	Mula-Mutha	Mula-Mutha at Mundhwa Bridge	Mundhawa	Haweli	Pune



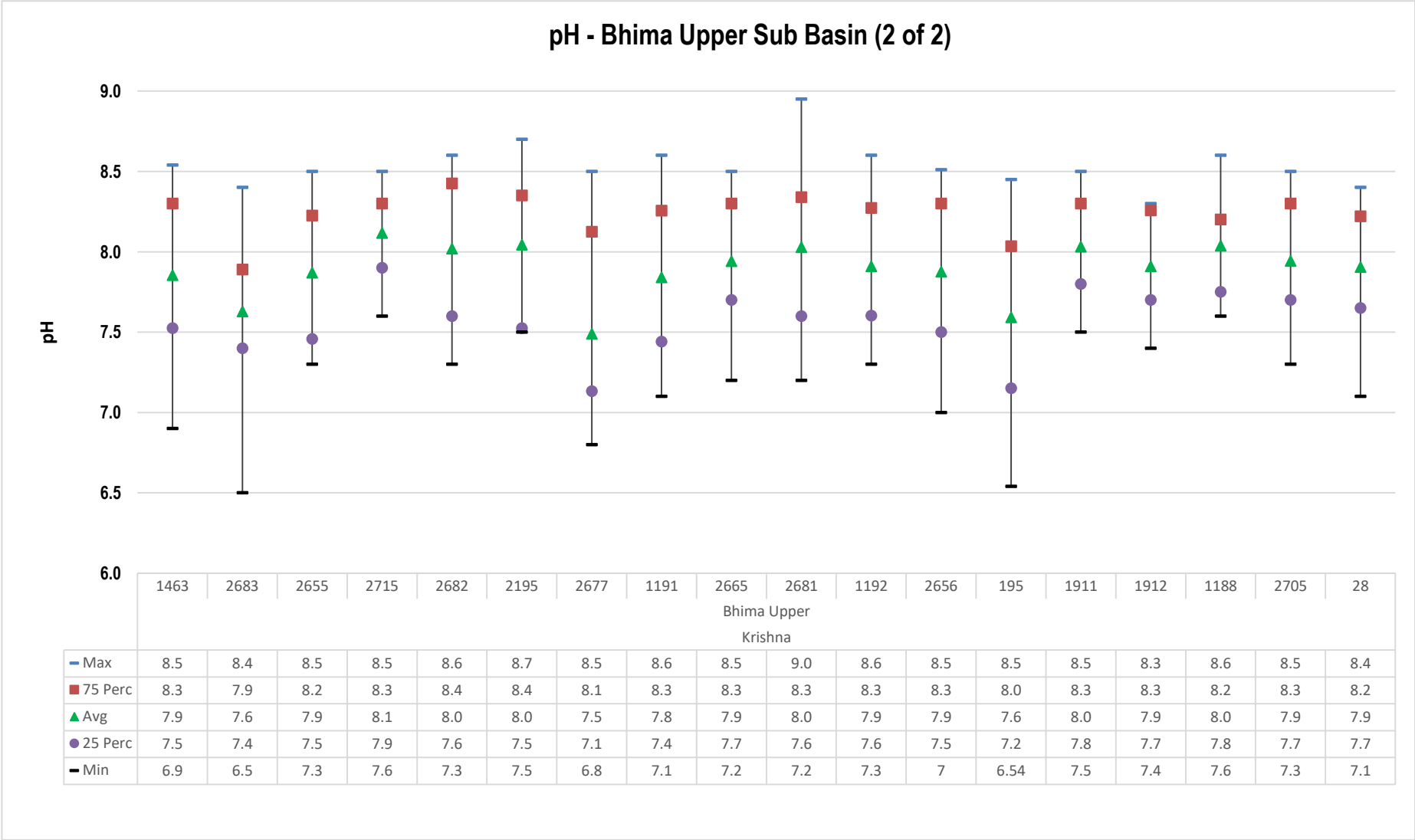
	1463	2683	2655	2715	2682	2195	2677	1191	2665	2681	1192	2656	195	1911	1912	1188	2705	28
	Bhima Upper Krishna																	
Max	6.8	6.8	6.7	6.6	6.7	6.6	6.6	6.8	6.8	6.6	6.6	6.8	5.2	6.6	6.8	6.6	6.5	6.5
75 Perc	6.6	6.6	6.4	6.4	6.5	6.2	5.9	5.8	6.5	6.0	6.0	6.2	4.5	5.8	5.7	6.3	6.1	6.0
Avg	5.8	5.7	5.4	5.6	5.6	5.2	5.1	5.5	5.7	5.3	5.4	5.7	0.0	5.3	5.1	5.5	5.9	5.3
25 Perc	5.1	4.8	4.7	5.1	4.8	4.5	4.4	4.8	5.9	5.1	4.5	5.2	0.0	4.7	4.2	5.5	5.5	4.4
Min	3.6	3.2	3.1	3.7	2.7	2.1	1.6	3.8	3.8	3.1	3.1	4.6	2.5	3.2	3	1.6	3.8	3

Figure No. 28: Trend of Dissolved Oxygen (DO) levels recorded at WQMS at Bhima upper sub basin -Krishna Basin (2 of 2)



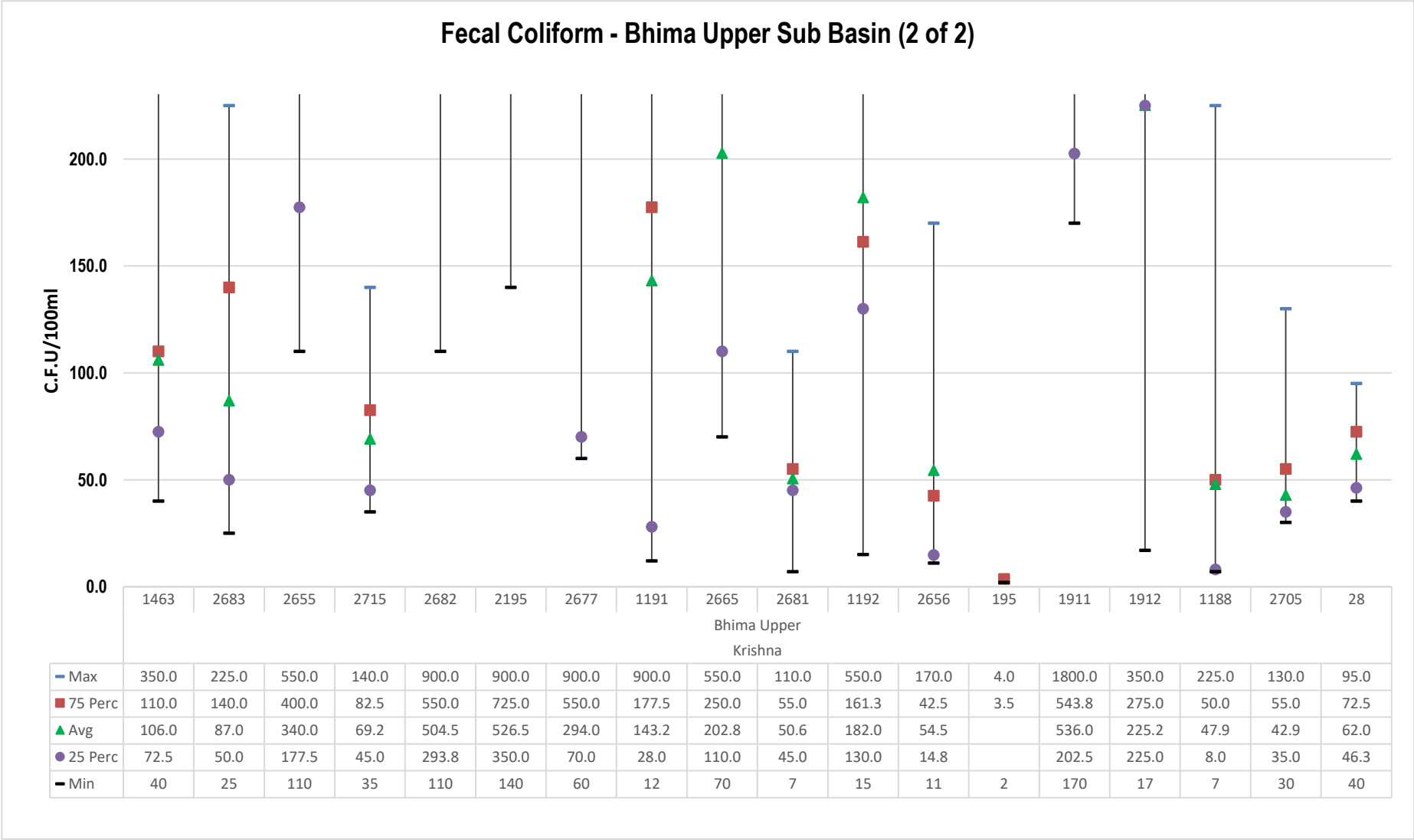
	1463	2683	2655	2715	2682	2195	2677	1191	2665	2681	1192	2656	195	1911	1912	1188	2705	28
	Bhima Upper Krishna																	
Max	6.5	7.5	11.0	12.0	8.0	9.0	16.5	14.0	8.0	12.5	7.5	8.0	42.0	8.0	11.0	11.0	11.0	11.0
75 Perc	5.1	4.6	8.9	7.3	6.1	8.3	8.6	6.3	7.0	10.3	6.6	5.6	32.0	6.3	7.6	8.5	8.3	8.0
Avg	4.1	4.2	6.0	5.9	4.8	6.1	7.2	5.9	5.2	7.9	5.6	4.9	28.4	5.7	6.4	6.2	6.4	6.2
25 Perc	3.0	2.9	3.3	3.1	3.0	3.8	5.0	3.9	3.0	5.5	5.0	3.6	25.0	5.5	5.1	3.7	4.5	3.6
Min	2	2.8	2.8	2.8	2.8	2.6	2.6	2.8	2.4	2.5	2.6	2.4	5.6	2.6	2.4	2.8	2.8	2.8

Figure No. 29: Trend of Biological Oxygen Demand (BOD) levels recorded at WQMS at Bhima upper sub basin -Krishna Basin (2 of 2)



	1463	2683	2655	2715	2682	2195	2677	1191	2665	2681	1192	2656	195	1911	1912	1188	2705	28
	Bhima Upper																	
	Krishna																	
Max	8.5	8.4	8.5	8.5	8.6	8.7	8.5	8.6	8.5	9.0	8.6	8.5	8.5	8.5	8.3	8.6	8.5	8.4
75 Perc	8.3	7.9	8.2	8.3	8.4	8.4	8.1	8.3	8.3	8.3	8.3	8.3	8.0	8.3	8.3	8.2	8.3	8.2
Avg	7.9	7.6	7.9	8.1	8.0	8.0	7.5	7.8	7.9	8.0	7.9	7.9	7.6	8.0	7.9	8.0	7.9	7.9
25 Perc	7.5	7.4	7.5	7.9	7.6	7.5	7.1	7.4	7.7	7.6	7.6	7.5	7.2	7.8	7.7	7.8	7.7	7.7
Min	6.9	6.5	7.3	7.6	7.3	7.5	6.8	7.1	7.2	7.2	7.3	7	6.54	7.5	7.4	7.6	7.3	7.1

Figure No. 30: Trend of pH levels recorded at WQMS at Bhima upper sub basin -Krishna Basin (2 of 2)



	1463	2683	2655	2715	2682	2195	2677	1191	2665	2681	1192	2656	195	1911	1912	1188	2705	28
	Bhima Upper																	
	Krishna																	
Max	350.0	225.0	550.0	140.0	900.0	900.0	900.0	900.0	550.0	110.0	550.0	170.0	4.0	1800.0	350.0	225.0	130.0	95.0
75 Perc	110.0	140.0	400.0	82.5	550.0	725.0	550.0	177.5	250.0	55.0	161.3	42.5	3.5	543.8	275.0	50.0	55.0	72.5
Avg	106.0	87.0	340.0	69.2	504.5	526.5	294.0	143.2	202.8	50.6	182.0	54.5		536.0	225.2	47.9	42.9	62.0
25 Perc	72.5	50.0	177.5	45.0	293.8	350.0	70.0	28.0	110.0	45.0	130.0	14.8		202.5	225.0	8.0	35.0	46.3
Min	40	25	110	35	110	140	60	12	70	7	15	11	2	170	17	7	30	40

Figure No. 31: Trend of Fecal Coliform levels recorded at WQMS at Bhima upper sub basin -Krishna Basin (2 of 2)

Water Quality Index for WQMS at Krishna Basin (1 of 2): Sub-basin - Bhima upper (2 of 2)

Apr	64	66	50	Dry	60	Dry	48	54	Dry	56	50	74	80	53	49	47	52	50
May	69	66	49	61	50	46	47	62	Dry	60	51	72	53	57	54	Dry	Dry	57
Jun	60	52	51	Dry	54	43	36	59	Dry	43	54	68	21	52	52	Dry	Dry	60
Jul	65	57	44	Dry	54	48	57	72	50	Dry	58	62	22	54	49	Dry	Dry	58
Aug	54	60	55	61	50	44	51	65	60	53	52	72	17	51	52	39	Dry	51
Sep	82	81	80	80	77	75	80	85	77	83	78	84	32	75	75	81	83	81
Oct	72	74	58	58	66	60	75	65	73	71	70	78	17	73	80	76	75	78
Nov	74	78	67	75	69	70	67	67	70	67	63	73	18	63	59	68	65	59
Dec	69	73	52	74	67	62	61	63	65	71	65	68	18	60	58	64	66	70
Jan	78	82	80	Dry	68	72	67	78	70	69	69	80	16	62	68	83	74	79
Feb	77	79	67	58	58	59	65	54	61	65	67	67	20	53	60	69	70	65
Mar	78	81	79	Dry	67	60	74	78	77	65	80	75	Dry	69	61	84	67	70
Station Code	1463	2683	2655	2715	2682	2195	2677	1191	2665	2681	1192	2656	195	1911	1912	1188	2705	28
Sub Basin	Bhima Upper (2 of 2)																	
Basin	Krishna																	

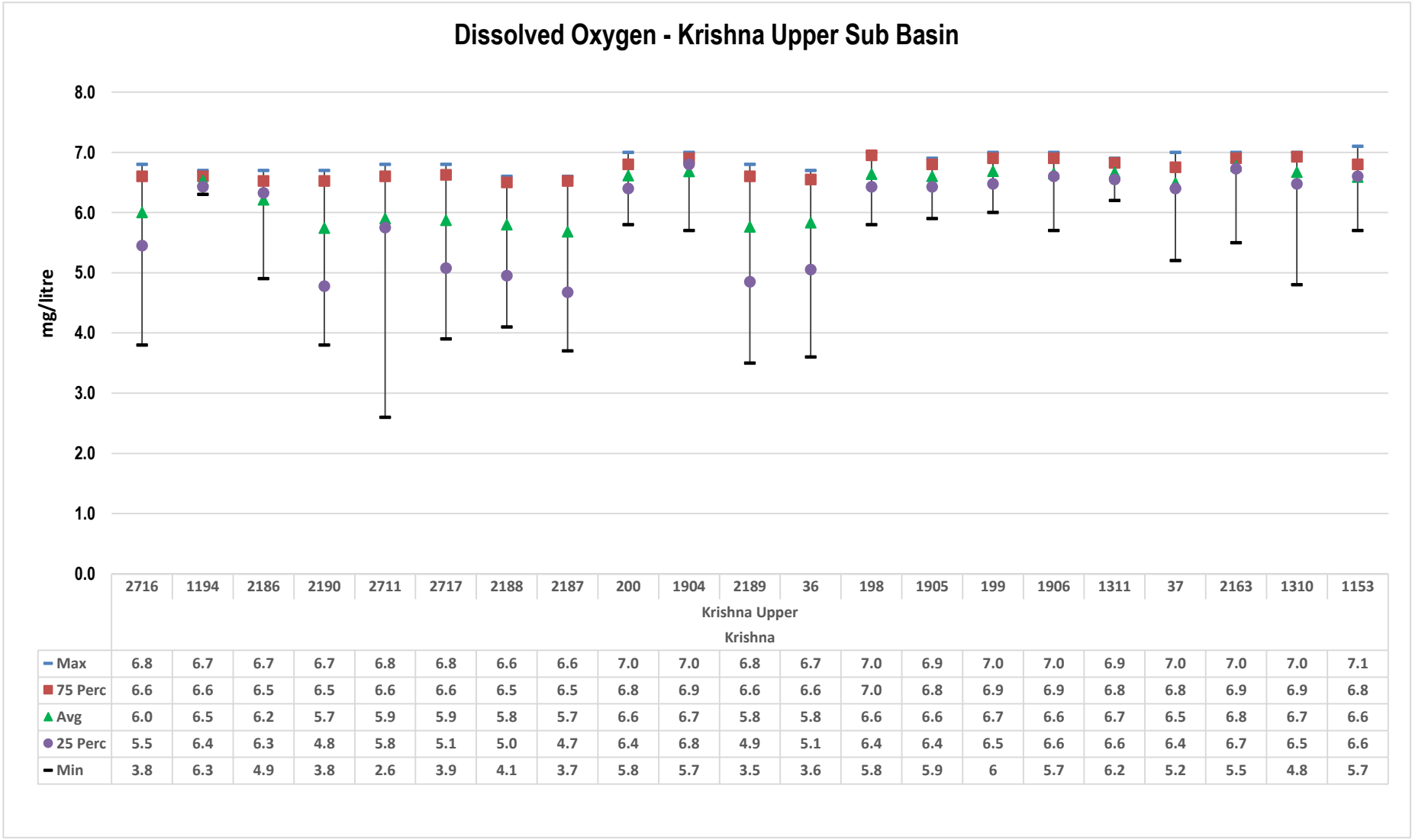
Legend

Good to Excellent	Medium to good	Bad	Bad to Very Bad	Dry	NA

Table No. 22: Surface water monitoring stations at Krishna Basin (1 of 2) Sub Basin Bhima Upper (2 of 2)

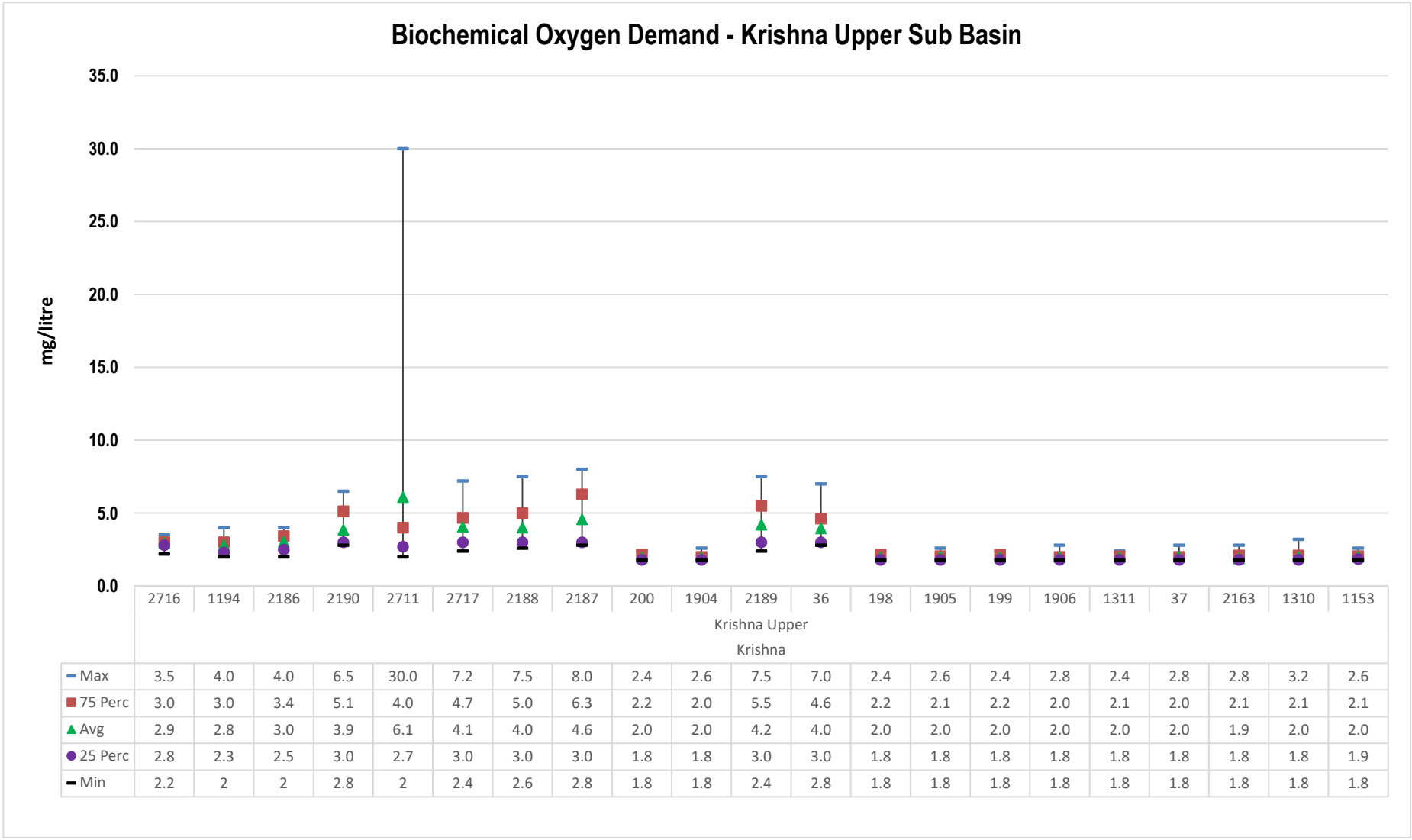
Program	Station ID	River/Nalla	Station Name	Village	Taluka	District
NWMP	1463	Nira	Nira at Sarola bridge	Sarola	Bhor	Pune
NWMP	2683	Nira	Nira at Shindewadi	Shindewadi, Shirwal	Khandala	Satara
NWMP	2655	Bhima	Bhima at Koregaon near Koregaon Bridge, Pune	Koregaon	Shirur	Pune
NWMP	2715	Vel	Vel at Shikrapur, Pune	Shikrapur	Shirur	Pune
NWMP	2682	Nira	Nira at U/s of Jubilant Organosis Pune	Nira(Datta ghat)	Baramati	Pune
NWMP	2195	Nira	Nira at D/s of Jubilant Organosis Pune	Nimbut	Baramati	Pune
NWMP	2677	Mula-Mutha	Mula-Mutha at D/s of Theur, Pune	Theur	Haweli	Pune
NWMP	1191	Bhima	Bhima after confluence with Mula-Mutha at Pargaon near Vasant Bandara	Pargaon	Daund	Pune
NWMP	2665	Ghod	Ghod at Shirur, Pune	Shirur	Shirur	Pune
NWMP	2681	Nira	Nira at Sangavi	Sangavi	Phaltan	Satara
NWMP	1192	Bhima	Bhima at Daund near Mahadev temple	Daund	Daund	Pune
NWMP	2656	Bhima	Bhima Backwater of Ujani Dam near raw water pump house	Kumbargaon	Indapur	Pune
SWMP	195	Sina	Sina Bridge At Burudgaon Road, A/P Ahmednagar, Taluka & District Ahmednagar	Burudgaon	Ahmednagar	Ahmednagar
NWMP	1911	Chandrabhaga	Chandrabhaga at U/s of Pandharpur town	Gursale	Pandarpur	Solapur
NWMP	1912	Chandrabhaga	Chandrabhaga at D/s of Pandharpur town near Vishnupant Mandir	Gopalpur	Pandarpur	Solapur

Program	Station ID	River/Nalla	Station Name	Village	Taluka	District
NWMP	1188	Bhima	Bhima at Narshingpur near Sangam Bridge after confluence with Nira	Narsingpur	Malshiros	Solapur
NWMP	2705	Sina	Sina near Laboti till naka Solapur	Laboti	Mohal	Solapur
NWMP	28	Bhima	Bhima at Takli	Takali	South Solapur	Solapur



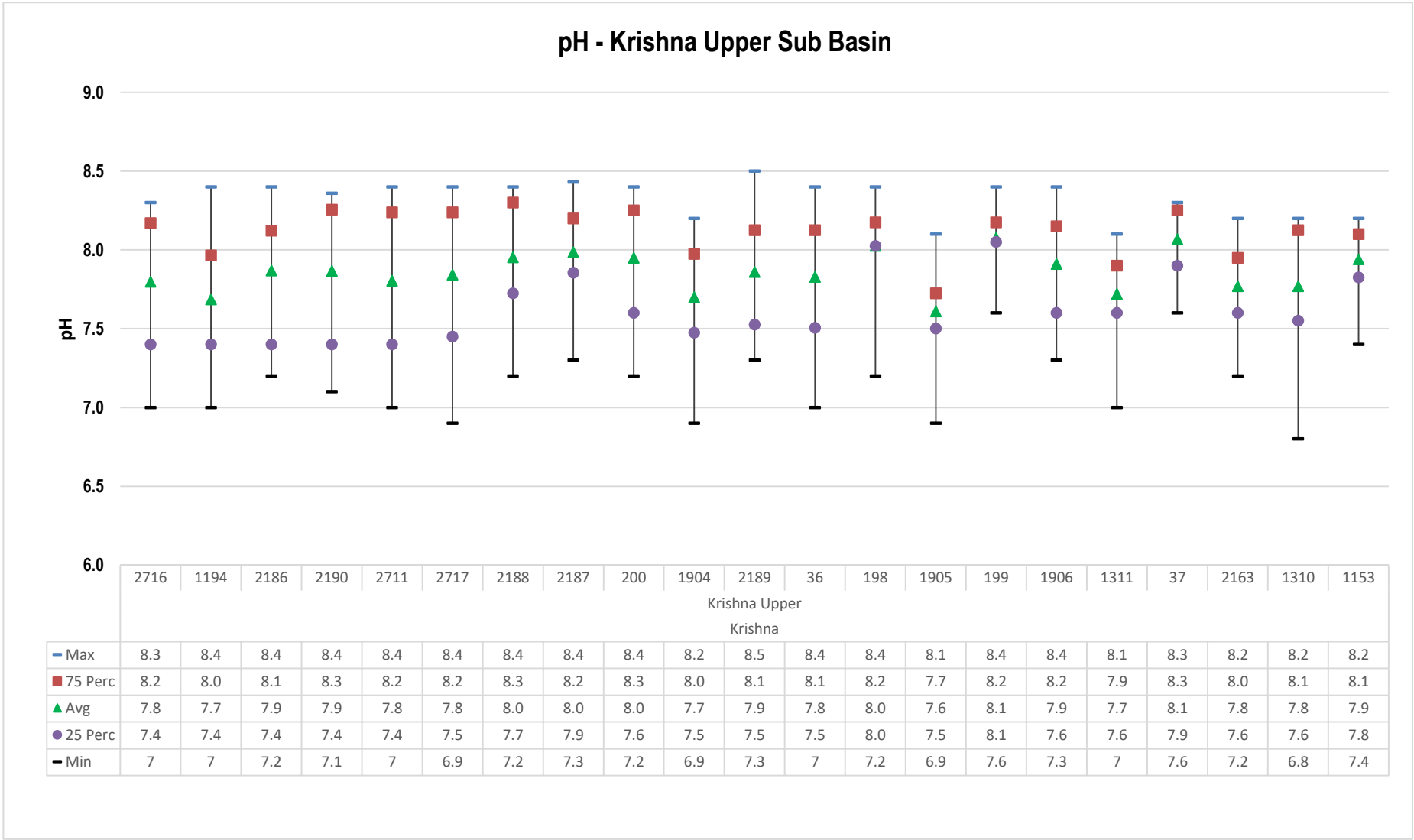
	2716	1194	2186	2190	2711	2717	2188	2187	200	1904	2189	36	198	1905	199	1906	1311	37	2163	1310	1153
	Krishna Upper Krishna																				
Max	6.8	6.7	6.7	6.7	6.8	6.8	6.6	6.6	7.0	7.0	6.8	6.7	7.0	6.9	7.0	7.0	6.9	7.0	7.0	7.0	7.1
75 Perc	6.6	6.6	6.5	6.5	6.6	6.6	6.5	6.5	6.8	6.9	6.6	6.6	7.0	6.8	6.9	6.9	6.8	6.8	6.9	6.9	6.8
Avg	6.0	6.5	6.2	5.7	5.9	5.9	5.8	5.7	6.6	6.7	5.8	5.8	6.6	6.6	6.7	6.6	6.7	6.5	6.8	6.7	6.6
25 Perc	5.5	6.4	6.3	4.8	5.8	5.1	5.0	4.7	6.4	6.8	4.9	5.1	6.4	6.4	6.5	6.6	6.6	6.4	6.7	6.5	6.6
Min	3.8	6.3	4.9	3.8	2.6	3.9	4.1	3.7	5.8	5.7	3.5	3.6	5.8	5.9	6	5.7	6.2	5.2	5.5	4.8	5.7

Figure No. 32: Trend of Dissolved Oxygen (DO) levels recorded at WQMS at Krishna upper sub basin -Krishna Basin



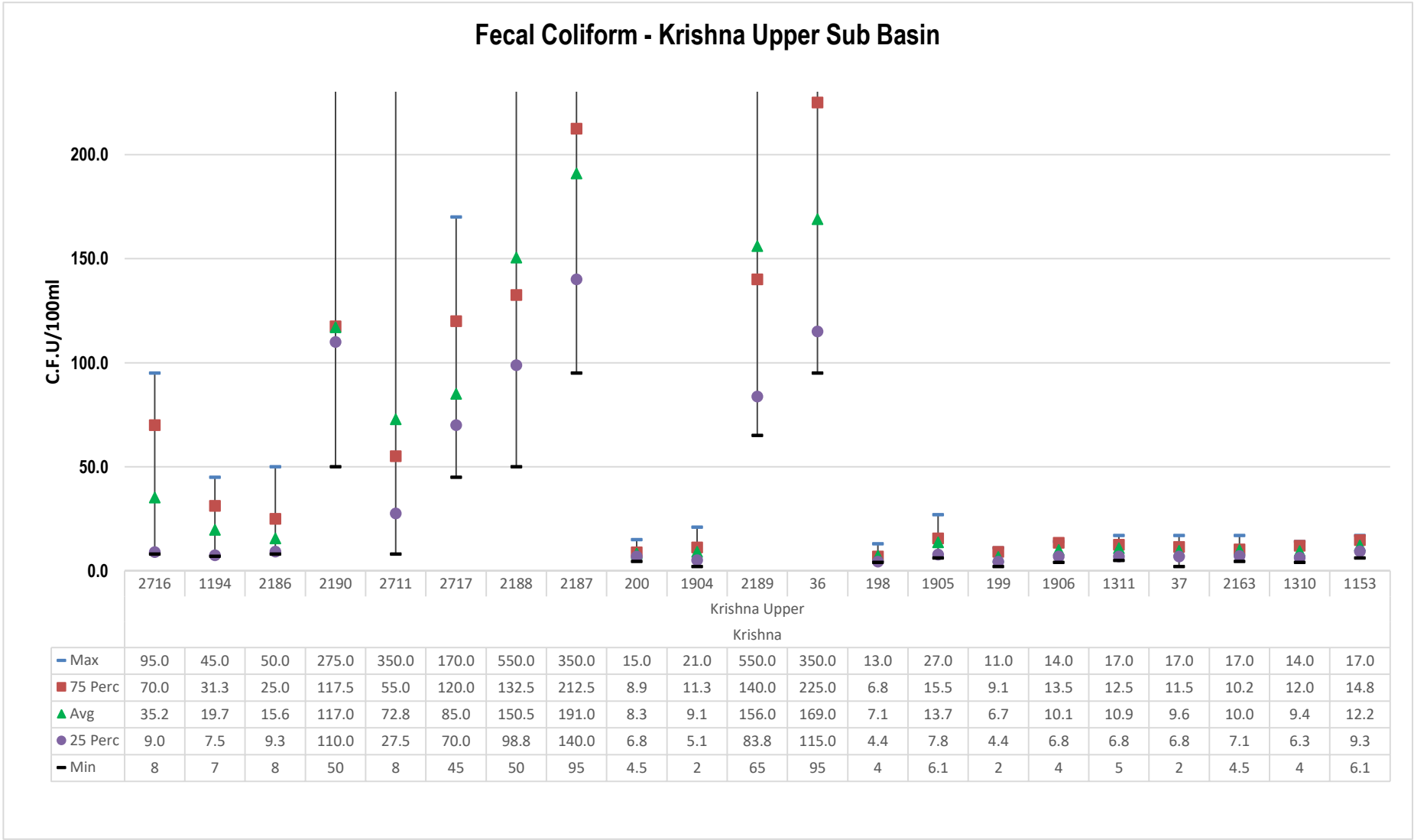
	2716	1194	2186	2190	2711	2717	2188	2187	200	1904	2189	36	198	1905	199	1906	1311	37	2163	1310	1153
	Krishna Upper Krishna																				
Max	3.5	4.0	4.0	6.5	30.0	7.2	7.5	8.0	2.4	2.6	7.5	7.0	2.4	2.6	2.4	2.8	2.4	2.8	2.8	3.2	2.6
75 Perc	3.0	3.0	3.4	5.1	4.0	4.7	5.0	6.3	2.2	2.0	5.5	4.6	2.2	2.1	2.2	2.0	2.1	2.0	2.1	2.1	2.1
Avg	2.9	2.8	3.0	3.9	6.1	4.1	4.0	4.6	2.0	2.0	4.2	4.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0
25 Perc	2.8	2.3	2.5	3.0	2.7	3.0	3.0	3.0	1.8	1.8	3.0	3.0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9
Min	2.2	2	2	2.8	2	2.4	2.6	2.8	1.8	1.8	2.4	2.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8

Figure No. 33: Trend of Biological Oxygen Demand (BOD) levels recorded at WQMS at Krishna upper sub basin - Krishna Basin



	2716	1194	2186	2190	2711	2717	2188	2187	200	1904	2189	36	198	1905	199	1906	1311	37	2163	1310	1153
	Krishna Upper Krishna																				
Max	8.3	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.2	8.5	8.4	8.4	8.1	8.4	8.4	8.1	8.3	8.2	8.2	8.2
75 Perc	8.2	8.0	8.1	8.3	8.2	8.2	8.3	8.2	8.3	8.0	8.1	8.1	8.2	7.7	8.2	8.2	7.9	8.3	8.0	8.1	8.1
Avg	7.8	7.7	7.9	7.9	7.8	7.8	8.0	8.0	8.0	7.7	7.9	7.8	8.0	7.6	8.1	7.9	7.7	8.1	7.8	7.8	7.9
25 Perc	7.4	7.4	7.4	7.4	7.4	7.5	7.7	7.9	7.6	7.5	7.5	7.5	8.0	7.5	8.1	7.6	7.6	7.9	7.6	7.6	7.8
Min	7	7	7.2	7.1	7	6.9	7.2	7.3	7.2	6.9	7.3	7	7.2	6.9	7.6	7.3	7	7.6	7.2	6.8	7.4

Figure No. 34: Trend of pH levels recorded at WQMS at Krishna upper sub basin -Krishna Basin



	2716	1194	2186	2190	2711	2717	2188	2187	200	1904	2189	36	198	1905	199	1906	1311	37	2163	1310	1153
Max	95.0	45.0	50.0	275.0	350.0	170.0	550.0	350.0	15.0	21.0	550.0	350.0	13.0	27.0	11.0	14.0	17.0	17.0	17.0	14.0	17.0
75 Perc	70.0	31.3	25.0	117.5	55.0	120.0	132.5	212.5	8.9	11.3	140.0	225.0	6.8	15.5	9.1	13.5	12.5	11.5	10.2	12.0	14.8
Avg	35.2	19.7	15.6	117.0	72.8	85.0	150.5	191.0	8.3	9.1	156.0	169.0	7.1	13.7	6.7	10.1	10.9	9.6	10.0	9.4	12.2
25 Perc	9.0	7.5	9.3	110.0	27.5	70.0	98.8	140.0	6.8	5.1	83.8	115.0	4.4	7.8	4.4	6.8	6.8	6.8	7.1	6.3	9.3
Min	8	7	8	50	8	45	50	95	4.5	2	65	95	4	6.1	2	4	5	2	4.5	4	6.1

Figure No. 35: Trend of Fecal Coliform recorded at WQMS at Krishna upper sub basin -Krishna Basin

Water Quality Index for WQMS at Krishna Basin (2 of 2): Sub-Basin - Krishna upper

Apr	75	86	77	57	69	62	56	56	86	91	66	63	86	87	87	85	88	90	82	77	85
May	83	85	77	58	76	64	62	58	85	84	68	67	86	85	86	83	85	86	87	88	86
Jun	65	80	70	54	36	59	58	54	89	84	57	56	87	85	90	83	81	78	82	89	78
Jul	68	88	83	58	79	57	60	53	88	87	56	60	89	84	86	88	86	88	87	86	89
Aug	75	87	75	59	67	61	57	54	Dry	89	57	57	Dry	87	Dry	Dry	87	Dry	85	88	84
Sep	84	82	88	80	86	83	81	79	80	85	82	82	80	87	82	84	88	83	86	88	84
Oct	82	82	83	71	82	75	74	74	83	87	73	73	85	87	82	82	87	83	86	85	83
Nov	83	81	80	76	70	75	72	62	87	81	70	70	83	80	85	82	84	83	83	81	81
Dec	81	83	81	76	75	75	73	73	83	83	74	72	82	83	82	83	82	82	83	81	82
Jan	81	83	83	78	83	80	77	74	80	87	76	79	82	84	86	84	85	83	84	82	83
Feb	81	81	80	72	74	72	72	73	83	84	72	72	85	85	83	83	84	82	86	84	83
Mar	80	82	85	78	82	76	78	78	Dry	83	79	77	Dry	83	Dry	84	84	83	85	80	81
Station Code	2716	1194	2186	2190	2711	2717	2188	2187	200	1904	2189	36	198	1905	199	1906	1311	37	2163	1310	1153
Sub Basin	Krishna Upper																				
Basin	Krishna																				

Legend

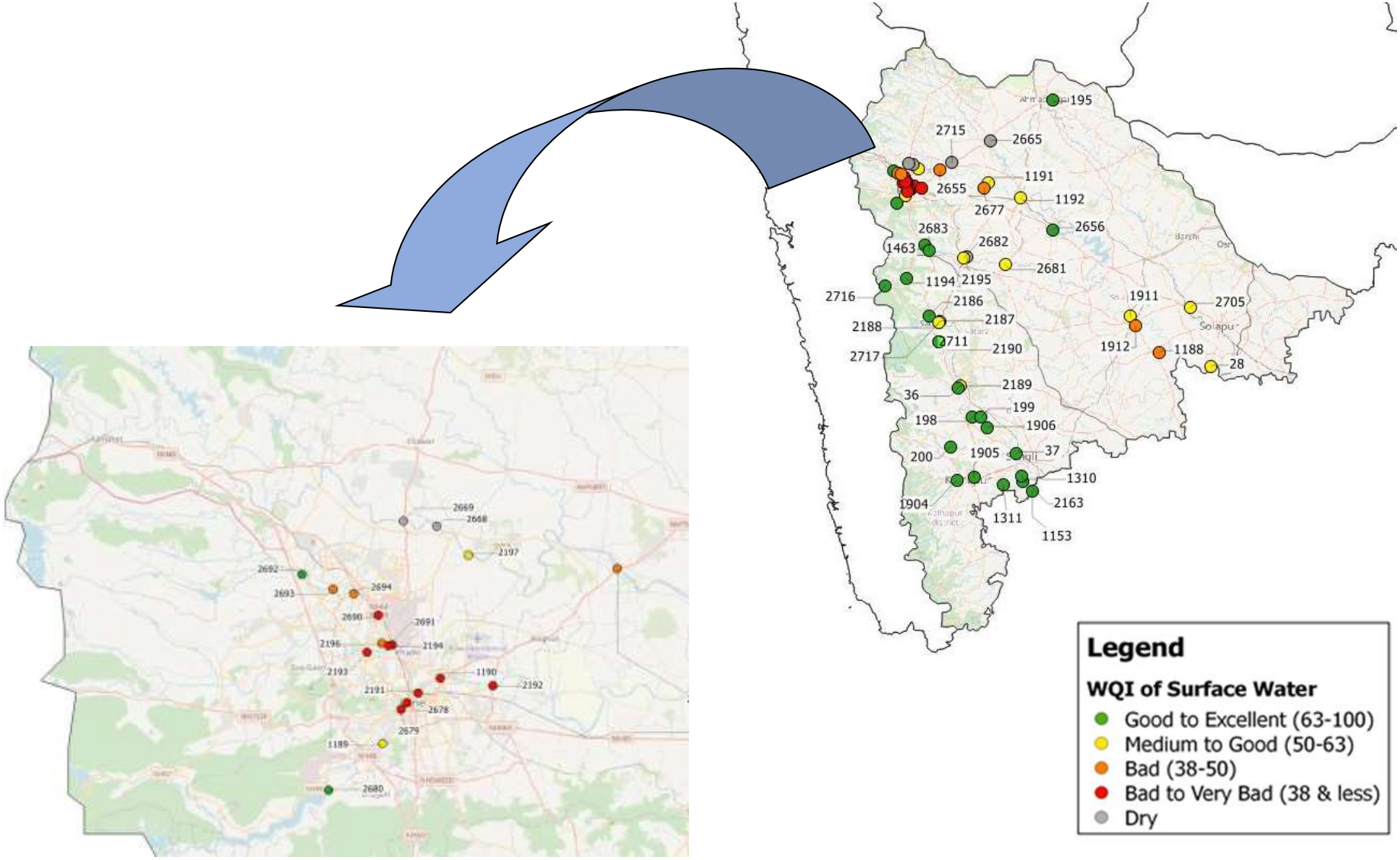
Good to Excellent	Medium to good	Bad	Bad to Very Bad	Dry	NA

Table No. 23: Surface water quality monitoring stations in Krishna Basin (2 of 2): Sub basin Krishna Upper

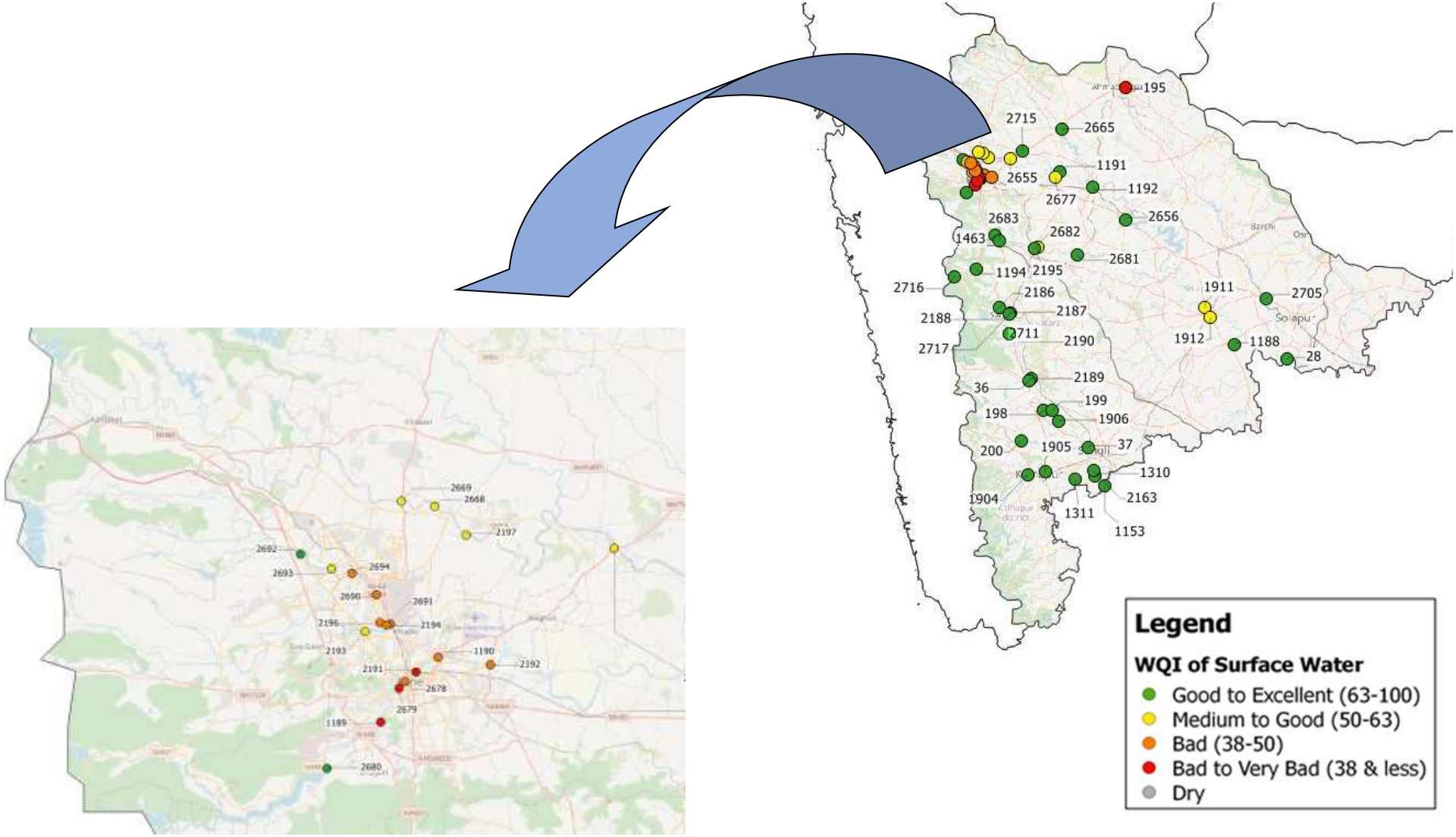
Program	Station ID	River/Nalla	Station Name	Village	Taluka	District
NWMP	2716	Venna	Venna at Mahabaleshwar	Mahabaleshwar	Mahabaleshwar	Satara
NWMP	1194	Krishna	Krishna at Dhom Dam	Wai	Mahabaleshwar	Satara
NWMP	2186	Venna	Venna at Varya, Satara	Varye	Satara	Satara
NWMP	2190	Krishna	Krishna at Wai	Wai	Wai	Satara
NWMP	2711	Urmodi	Urmodi at Nagthane Satara	Nagthane	Satara	Satara
NWMP	2717	Venna	Venna at Mahuli	Mahuli	Satara	Satara
NWMP	2188	Krishna	Krishna at Krishna-Venna Sangam, Mahuli	Mahuli	Mahuli	Satara
NWMP	2187	Krishna	Krishna at Kshetra Mahuli Satara	Kshetra Mahuli	Mahuli	Satara
SWMP	200	Warna	Mangle Bridge, (After Confluence of Morna)	Mangle	Shirala	Sangli
NWMP	1904	Panchganga	U/s of Kolhapur town near Balinga Pumping Station	Balinga	Karvir	Kolhapur
NWMP	2189	Koyna	Koyna at Karad	Karad	Karad	Satara
NWMP	36	Krishna	Krishna at Krishna Bridge, Karad	Karad	Karad	Satara
SWMP	198	Krishna	Bahe KT Weir, Bahe, Taluka - Walwa, District - Sangli	Bahe	Walwa	Sangli
NWMP	1905	Panchaganga	Panchaganga at D/s of Kolhapur town at Gandhi nagar near NH-4 bridge and MIDC intake well	Uchegaon	Kolhapur	Kolhapur
SWMP	199	Krishna	Borgaon KT Weir, Borgaon, Taluka - Walwa, District - Sangli	Borgaon	Walwa	Sangli
NWMP	1906	Krishna	Krishna at Walwa, D/s of Islampur near Vithal Temple	Walwa	Walwa	Sangli

Program	Station ID	River/Nalla	Station Name	Village	Taluka	District
NWMP	1311	Panchganga	Panchganga at Ichalkaranji near MIDC intake well	Shiradhwad (Ichalkaranji ghat)	Hatkanangale	Kolhapur
NWMP	37	Krishna	Krishna at Maighat, Sangli	Gawali gally	Miraj	Sangli
NWMP	2163	Panchganga	Panchganga at Shirol near Shirol intake well	Shirol	Shirol	Kolhapur
NWMP	1310	Krishna	Krishna at Kurundwad	Narshingwadi, Kurundwad	Shirol	Kolhapur
NWMP	1153	Krishna	Krishna at Rajapur Weir	Rajapur	Shirol	Kolhapur

Spatial map of Surface WQI at Krishna Basin (April 2019)



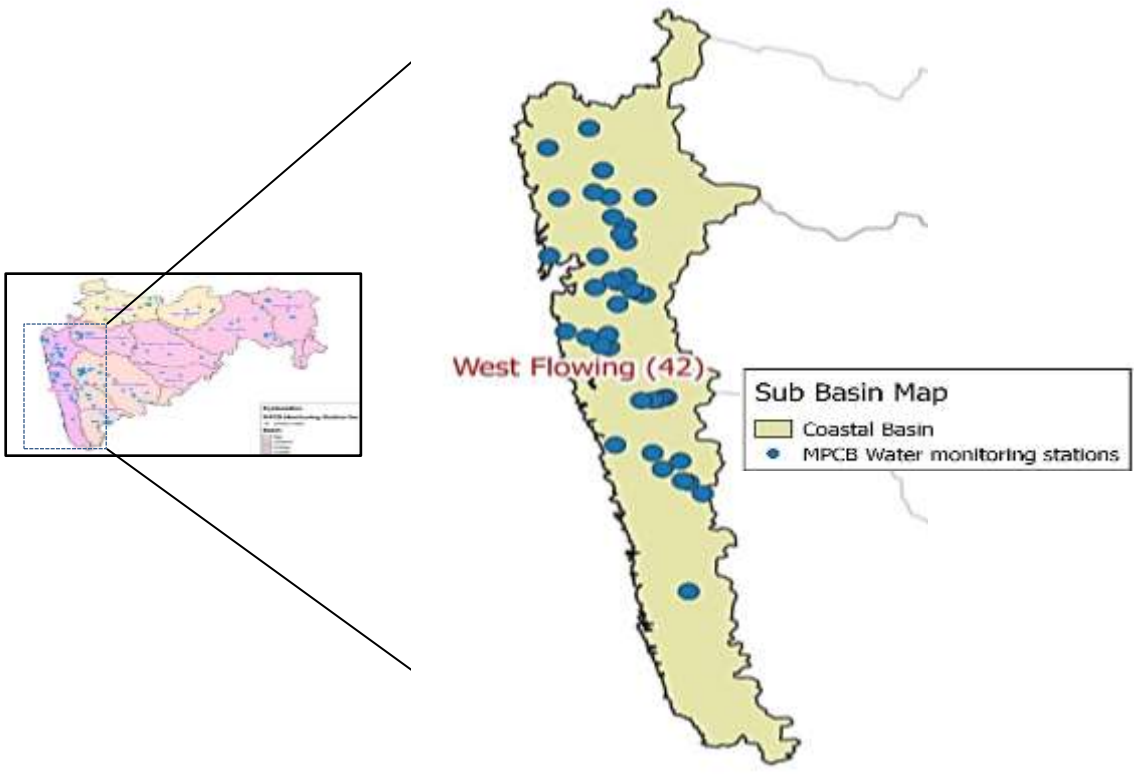
Spatial map of Surface WQI at Krishna Basin (December 2019)



West Flowing Rivers

West flowing river basins consist of small independent river basins of peninsular India which drains into an Arabian Sea. It covers areas in the states of Maharshtra, Goa, Karnataka, TamilNadu and Kerala. All west flowing rivers originates from high mountains of Western Ghats and generally have steep high banks[25]. In case of Maharashtra, there are important west flowing rivers which include the Damanganga the Surya, the Vaitarna, the Ulhas, the Savitri, the Kundalika, the Patalganga, the Vashisti, the Shastri, the Karli, and the Terekhol along with fewer smaller rivers. West flowing rivers cover an area equivalent to 10.7% of total land area of Maharashtra state and contribute to about 44.54% of the yield at 75% dependability of Maharashtra state[26]. Compared to East flowing rivers, the West flowing rivers of Peninsular India are fewer and smaller (Map No. 8)

Water from these rivers gets utilized for drinking, agricultural and industrial applications. In fact, there are numerous industrial zones set up on the banks of these rivers such as Rasaynai industrial area on Patalganga river, Roha industrial estate along Kundalika river, Lote Parshuram MIDC on Vashishti river and Mahad MIDC along Savitri and Ghot rivers. The effluents from these industrial complexes makes these rivers prone to water pollution. To monitor the overall status of the river system, MPCB has installed total 41 WQMS along the west flowing rivers.



Map No. 8: Network of surface water quality monitoring stations in West flowing rivers basin

[25] http://www.cwc.gov.in/sites/default/files/admin/West-Flowing-Rivers-Basin-Write-2008-09.pdf

[26] https://sandrp.files.wordpress.com/2018/03/rivers_of_maharashtra_dec_2011.pdf

West Flowing River Basin (Intra and Inter Basin analysis)

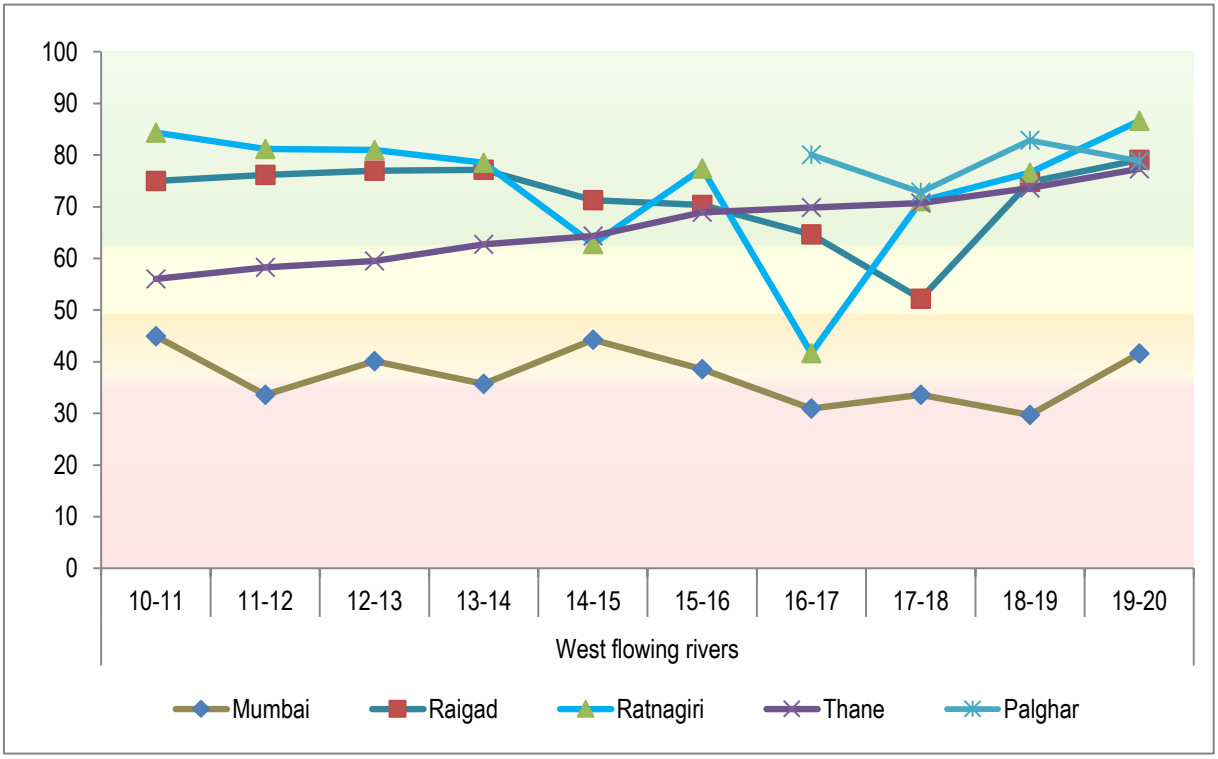


Figure No. 36: Trend of annual average WQI across districts of West Flowing basin

WQI	Category	Class by CPCB	Remarks
63-100	Good to Excellent	A	Non polluted
50-63	Medium to Good	B	Non polluted
38-50	Bad	C	Polluted
38 & less	Bad to Very Bad	D, E	Heavily polluted

Note: This graph considers the average WQI for all the monitoring stations in that particular district and hence may include some bias. This graph is only for an overview and monitoring station wise data maybe analyzed to pin point the most affected and polluted patches of rivers in that district.

Inter basin performance of West flowing rivers across 5 districts of Maharashtra state has been depicted in Figure No. 36

Except for Mumbai district, WQI recorded at all remaining 4 district was found to be in 'Good to Excellent' category. Even so, WQI recorded at Palghar district showed slight decreasing trend in WQI from 83 (2018-19) to 79 (2019-20).In case of Mumbai district, WQI is improved from 'Bad toVery Bad' (30) to 'Bad'category (42) in 2019-20. Even though WQI is improved in Mumbai district, still it comes under polluted category.Further mitigative measures are needed to be implemented to further improve the water quality in Mumbai district.

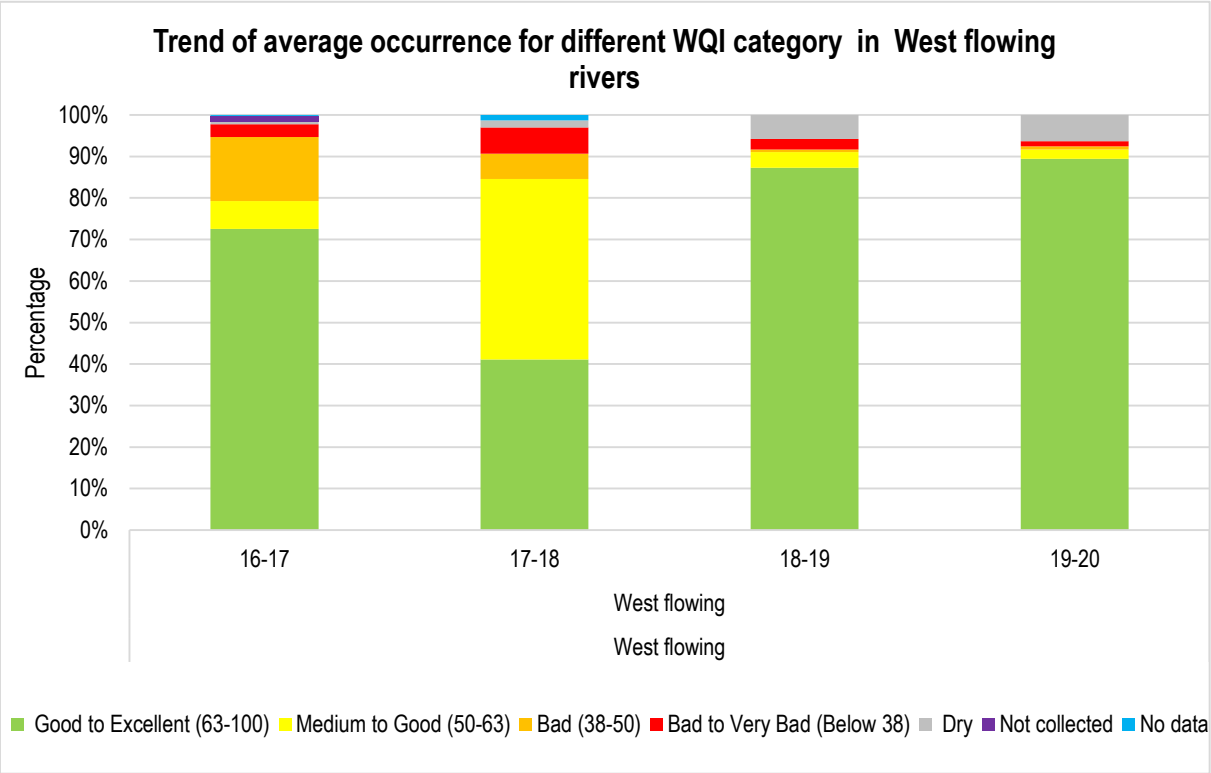
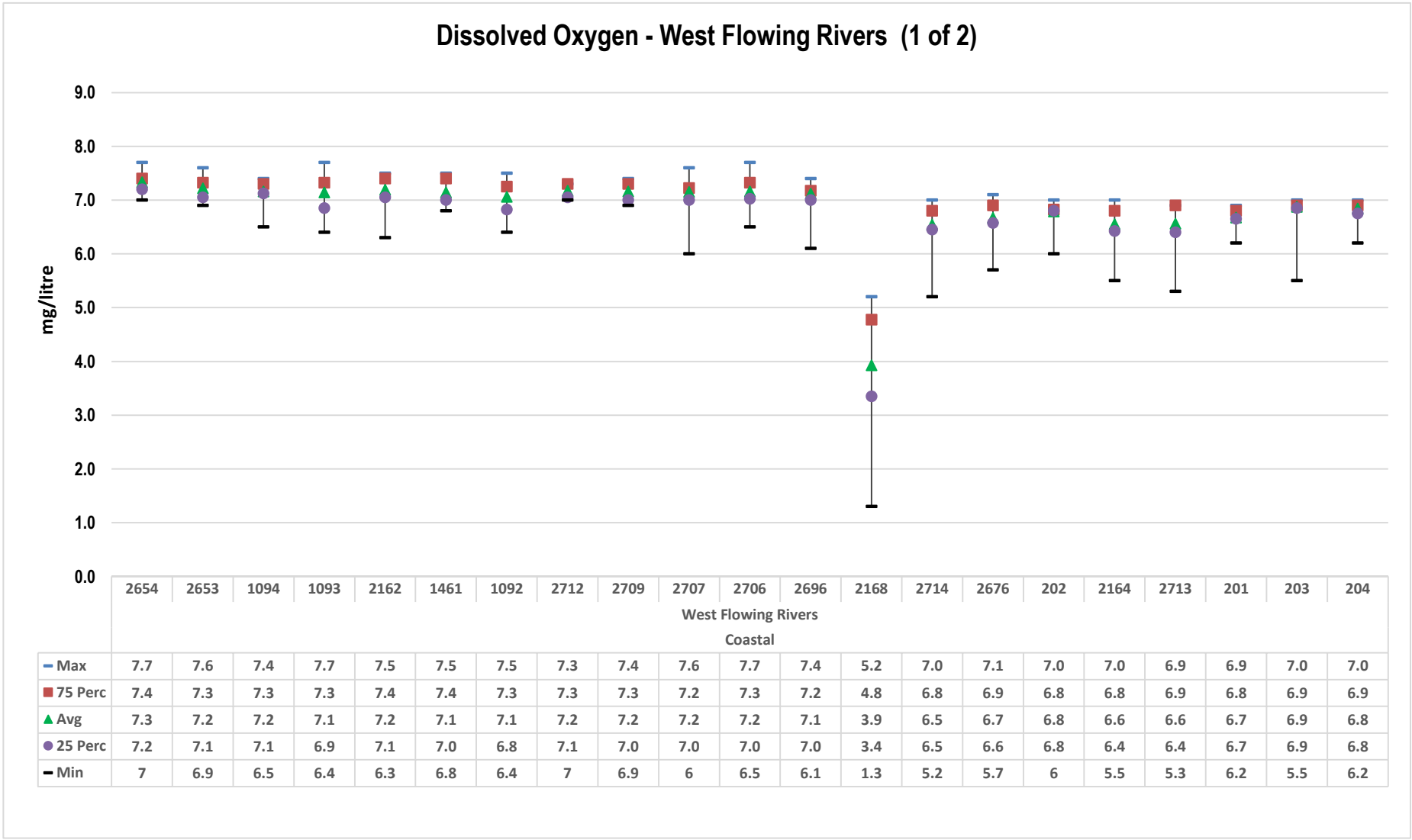


Figure No. 37: Trend of Average occurrence for different category of WQI in West flowing rivers

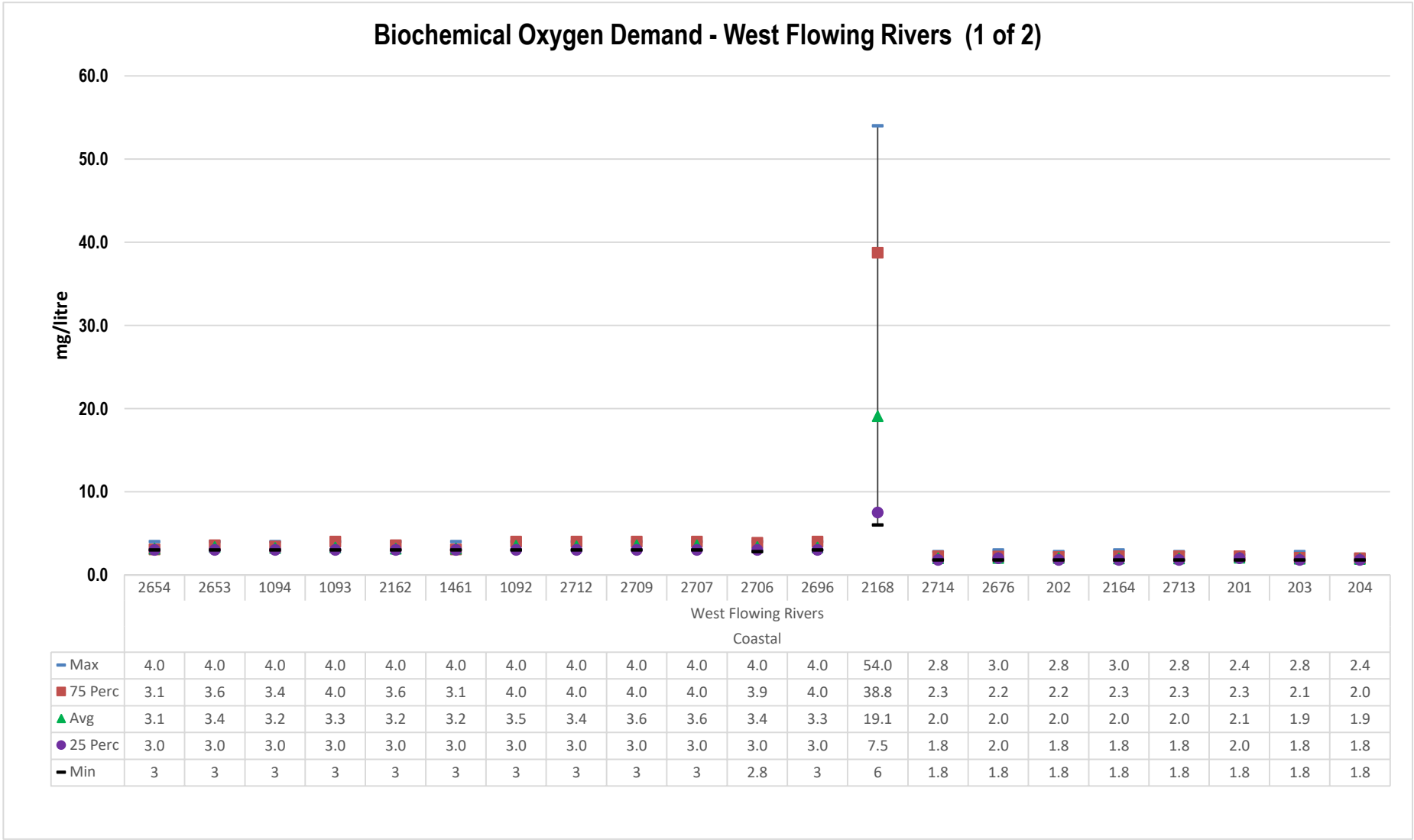
From Figure No. 37 depicts the interbasin performance of west flowing rivers; it clearly indicates that the majority of the observations were recorded under the 'Good to excellent' category. Around 89% of the total observations were recorded under this category.

Decreasing trend was observed in case of 'Medium to Good' (3.8% to 2.2%) and 'Bad to Very Bad' (from 2.6% to 1.2%) in 2019-20 whereas marginal increase was observed in 'Dry' category observations (from 5.7% to 6.3%) in 2019-20.



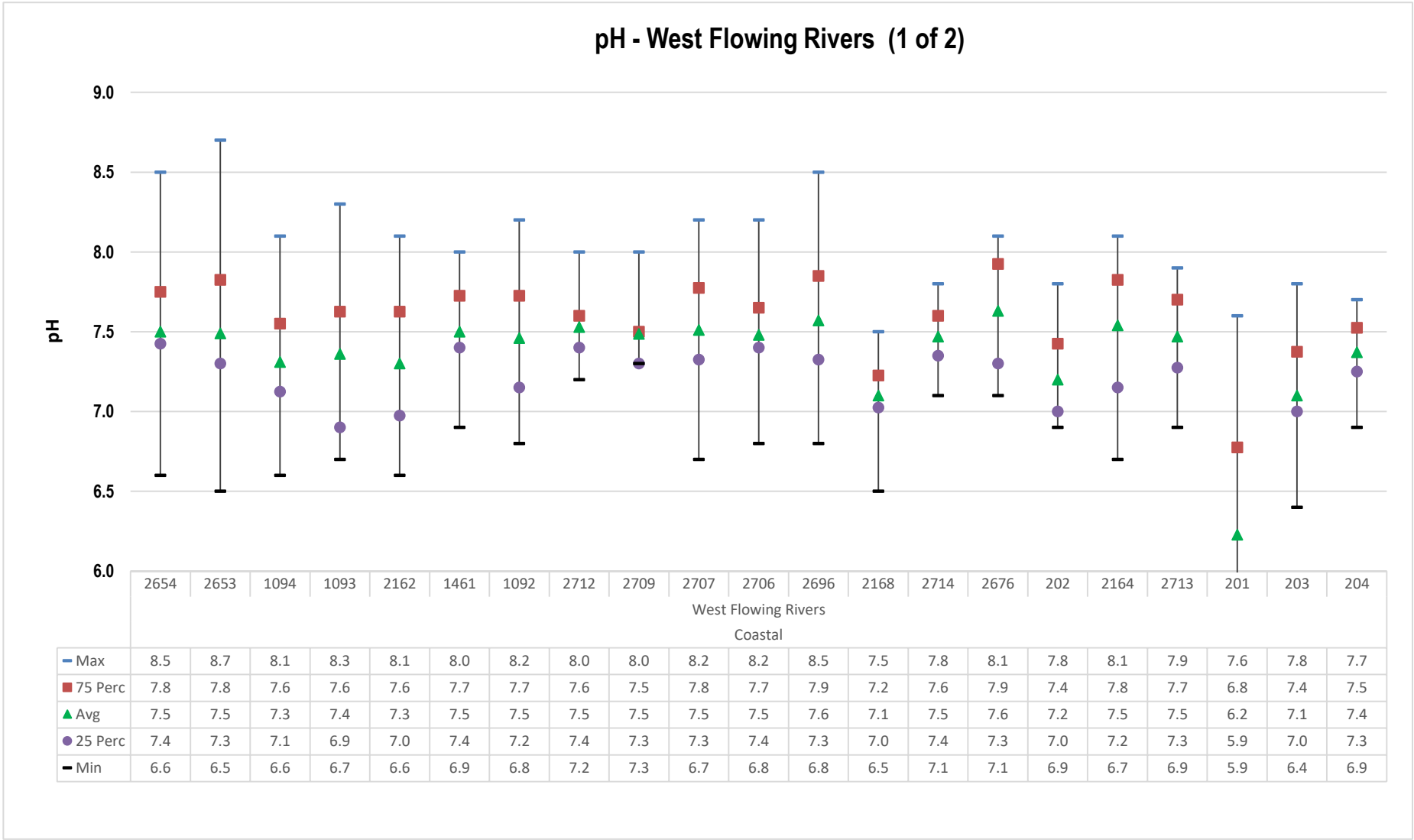
	2654	2653	1094	1093	2162	1461	1092	2712	2709	2707	2706	2696	2168	2714	2676	202	2164	2713	201	203	204
	West Flowing Rivers																				
	Coastal																				
Max	7.7	7.6	7.4	7.7	7.5	7.5	7.5	7.3	7.4	7.6	7.7	7.4	5.2	7.0	7.1	7.0	7.0	6.9	6.9	7.0	7.0
75 Perc	7.4	7.3	7.3	7.3	7.4	7.4	7.3	7.3	7.3	7.2	7.3	7.2	4.8	6.8	6.9	6.8	6.8	6.9	6.8	6.9	6.9
Avg	7.3	7.2	7.2	7.1	7.2	7.1	7.1	7.2	7.2	7.2	7.2	7.1	3.9	6.5	6.7	6.8	6.6	6.6	6.7	6.9	6.8
25 Perc	7.2	7.1	7.1	6.9	7.1	7.0	6.8	7.1	7.0	7.0	7.0	7.0	3.4	6.5	6.6	6.8	6.4	6.4	6.7	6.9	6.8
Min	7	6.9	6.5	6.4	6.3	6.8	6.4	7	6.9	6	6.5	6.1	1.3	5.2	5.7	6	5.5	5.3	6.2	5.5	6.2

Figure No. 38: Trend of Dissolved Oxygen (DO) levels recorded at WQMS at West flowing rivers (Coastal basin) (1 of 2)



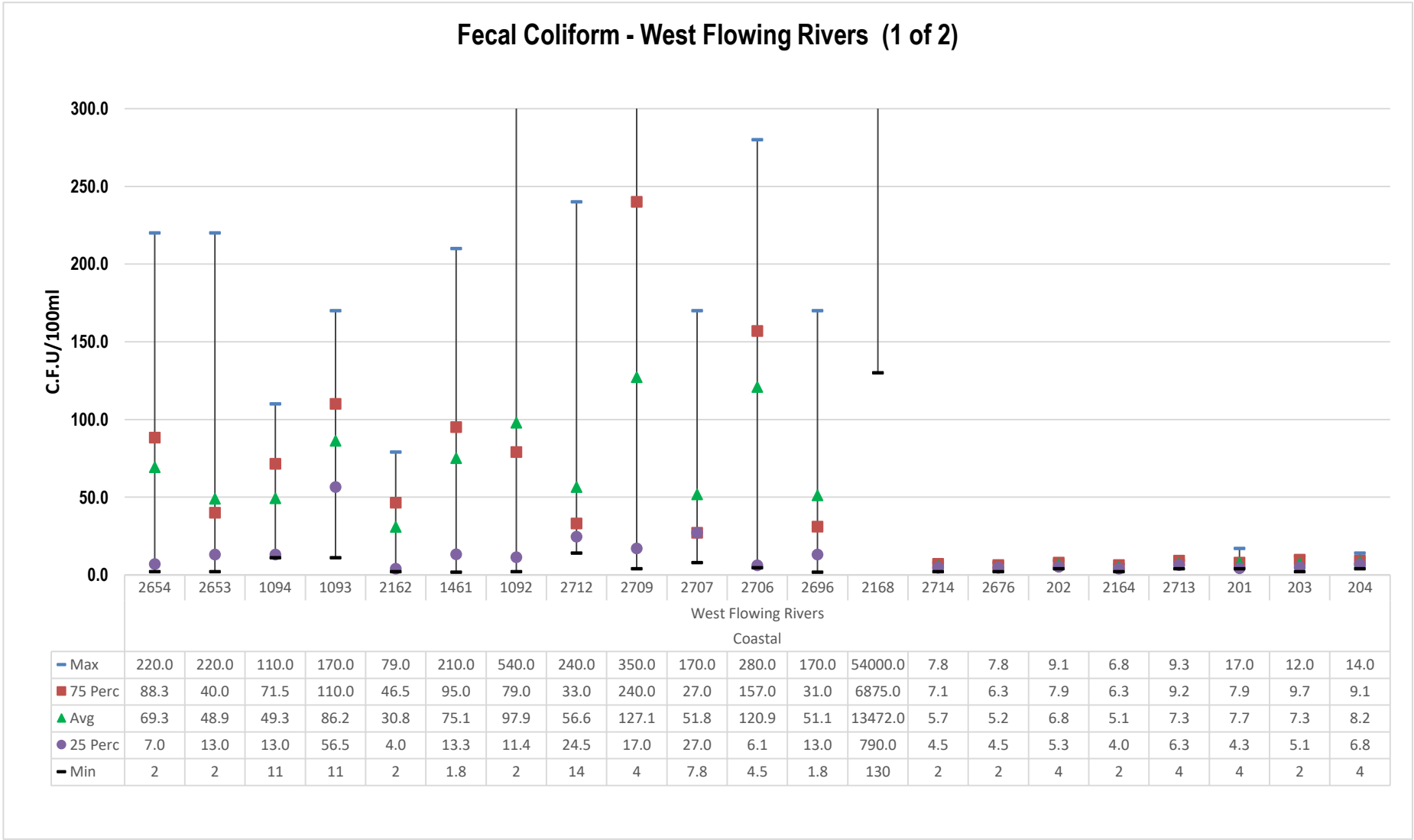
	2654	2653	1094	1093	2162	1461	1092	2712	2709	2707	2706	2696	2168	2714	2676	202	2164	2713	201	203	204
Max	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	54.0	2.8	3.0	2.8	3.0	2.8	2.4	2.8	2.4
75 Perc	3.1	3.6	3.4	4.0	3.6	3.1	4.0	4.0	4.0	4.0	3.9	4.0	38.8	2.3	2.2	2.2	2.3	2.3	2.3	2.1	2.0
Avg	3.1	3.4	3.2	3.3	3.2	3.2	3.5	3.4	3.6	3.6	3.4	3.3	19.1	2.0	2.0	2.0	2.0	2.0	2.1	1.9	1.9
25 Perc	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	7.5	1.8	2.0	1.8	1.8	1.8	2.0	1.8	1.8
Min	3	3	3	3	3	3	3	3	3	3	2.8	3	6	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8

Figure No. 39: Trend of Biological Oxygen Demand (BOD) levels recorded at WQMS at West flowing rivers (Coastal basin) (1 of 2)



	2654	2653	1094	1093	2162	1461	1092	2712	2709	2707	2706	2696	2168	2714	2676	202	2164	2713	201	203	204
	West Flowing Rivers																				
	Coastal																				
Max	8.5	8.7	8.1	8.3	8.1	8.0	8.2	8.0	8.0	8.2	8.2	8.5	7.5	7.8	8.1	7.8	8.1	7.9	7.6	7.8	7.7
75 Perc	7.8	7.8	7.6	7.6	7.6	7.7	7.7	7.6	7.5	7.8	7.7	7.9	7.2	7.6	7.9	7.4	7.8	7.7	6.8	7.4	7.5
Avg	7.5	7.5	7.3	7.4	7.3	7.5	7.5	7.5	7.5	7.5	7.5	7.6	7.1	7.5	7.6	7.2	7.5	7.5	6.2	7.1	7.4
25 Perc	7.4	7.3	7.1	6.9	7.0	7.4	7.2	7.4	7.3	7.3	7.4	7.3	7.0	7.4	7.3	7.0	7.2	7.3	5.9	7.0	7.3
Min	6.6	6.5	6.6	6.7	6.6	6.9	6.8	7.2	7.3	6.7	6.8	6.8	6.5	7.1	7.1	6.9	6.7	6.9	5.9	6.4	6.9

Figure No. 40: Trend of pH levels recorded at WQMS at West flowing rivers (Coastal basin) (1 of 2)



	2654	2653	1094	1093	2162	1461	1092	2712	2709	2707	2706	2696	2168	2714	2676	202	2164	2713	201	203	204
Max	220.0	220.0	110.0	170.0	79.0	210.0	540.0	240.0	350.0	170.0	280.0	170.0	54000.0	7.8	7.8	9.1	6.8	9.3	17.0	12.0	14.0
75 Perc	88.3	40.0	71.5	110.0	46.5	95.0	79.0	33.0	240.0	27.0	157.0	31.0	6875.0	7.1	6.3	7.9	6.3	9.2	7.9	9.7	9.1
Avg	69.3	48.9	49.3	86.2	30.8	75.1	97.9	56.6	127.1	51.8	120.9	51.1	13472.0	5.7	5.2	6.8	5.1	7.3	7.7	7.3	8.2
25 Perc	7.0	13.0	13.0	56.5	4.0	13.3	11.4	24.5	17.0	27.0	6.1	13.0	790.0	4.5	4.5	5.3	4.0	6.3	4.3	5.1	6.8
Min	2	2	11	11	2	1.8	2	14	4	7.8	4.5	1.8	130	2	2	4	2	4	4	2	4

Figure No. 41: Trend of Fecal Coliform recorded at WQMS at West flowing rivers (Coastal basin) (1 of 2)

Water Quality Index of WQMS on West Flowing rivers (1 of 2)

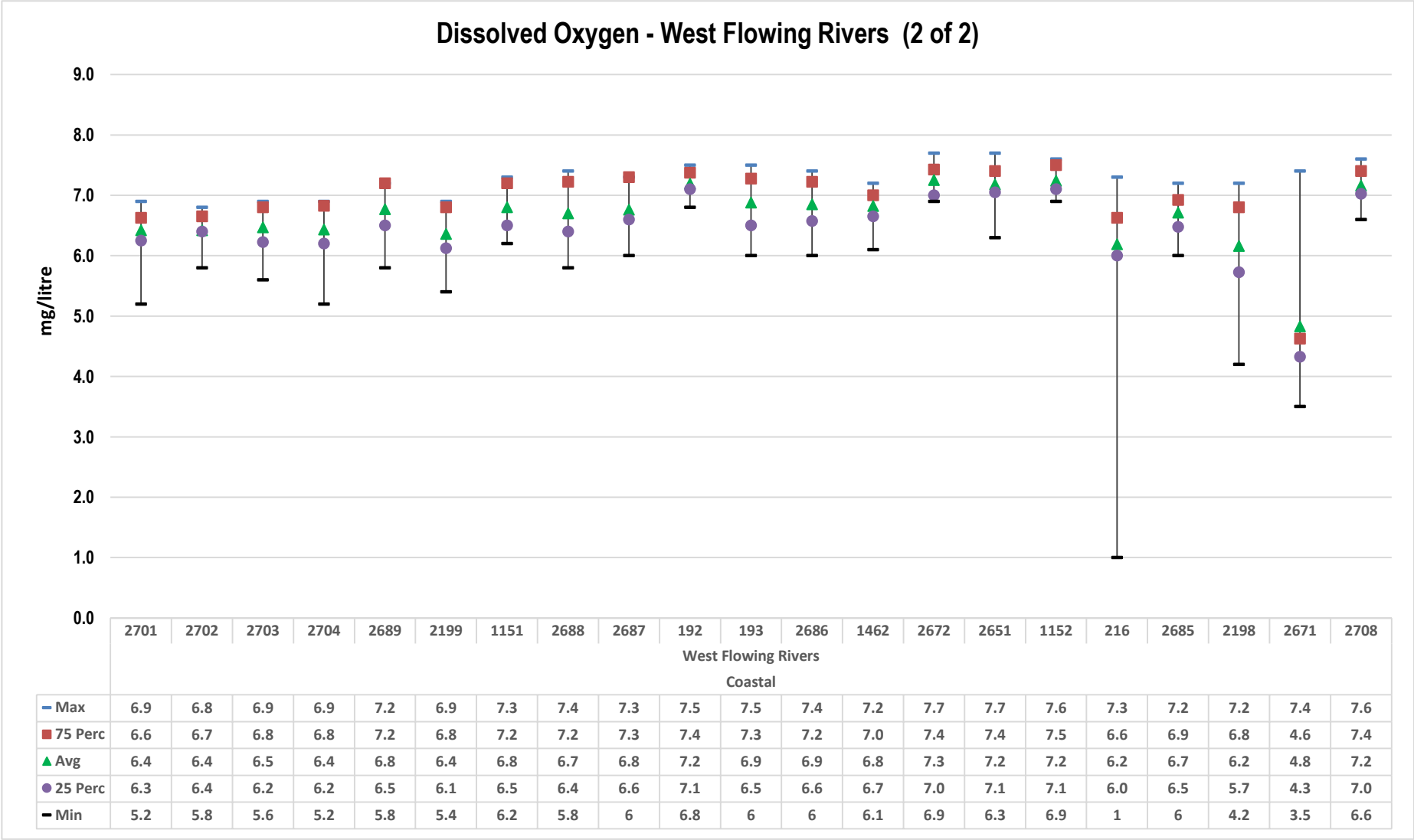
Apr	78	80	84	82	85	78	79	Dry	Dry	79	81	82	22	87	82	87	87	84	87	80	87
May	78	77	81	84	83	81	79	Dry	Dry	80	82	82	27	88	84	Dry	91	89	Dry	Dry	Dry
Jun	83	72	84	76	84	89	86	Dry	Dry	63	65	84	32	79	80	Dry	79	80	Dry	Dry	Dry
Jul	83	79	80	77	80	74	78	77	78	71	74	79	60	91	92	86	92	91	81	84	87
Aug	76	80	84	77	88	84	83	82	77	79	87	80	60	87	92	89	90	87	81	93	90
Sep	73	72	76	75	75	72	70	73	72	79	72	75	63	89	85	88	90	88	79	90	88
Oct	73	77	78	78	81	73	76	80	73	82	74	74	46	92	87	Dry	88	87	Dry	Dry	Dry
Nov	82	82	76	76	89	76	85	83	81	90	87	81	53	88	85	88	88	87	89	86	84
Dec	85	85	80	79	79	84	78	79	86	89	90	85	47	91	88	90	85	86	77	88	86
Jan	81	83	81	77	79	80	76	81	84	90	89	81	44	88	85	87	89	88	76	86	88
Feb	87	85	89	68	89	85	79	Dry	Dry	80	85	85	22	88	89	87	87	86	84	86	86
Mar	86	87	85	78	84	81	80	Dry	Dry	88	89	83	23	88	88	Dry	87	88	Dry	Dry	Dry
Station Code	2654	2653	1094	1093	2162	1461	1092	2712	2709	2707	2706	2696	2168	2714	2676	202	2164	2713	201	203	204
Sub Basin	West Flowing Rivers (1 of 2)																				
Basin	Coastal																				

Legend

Good to Excellent	Medium to good	Bad	Bad to Very Bad	Dry	NA

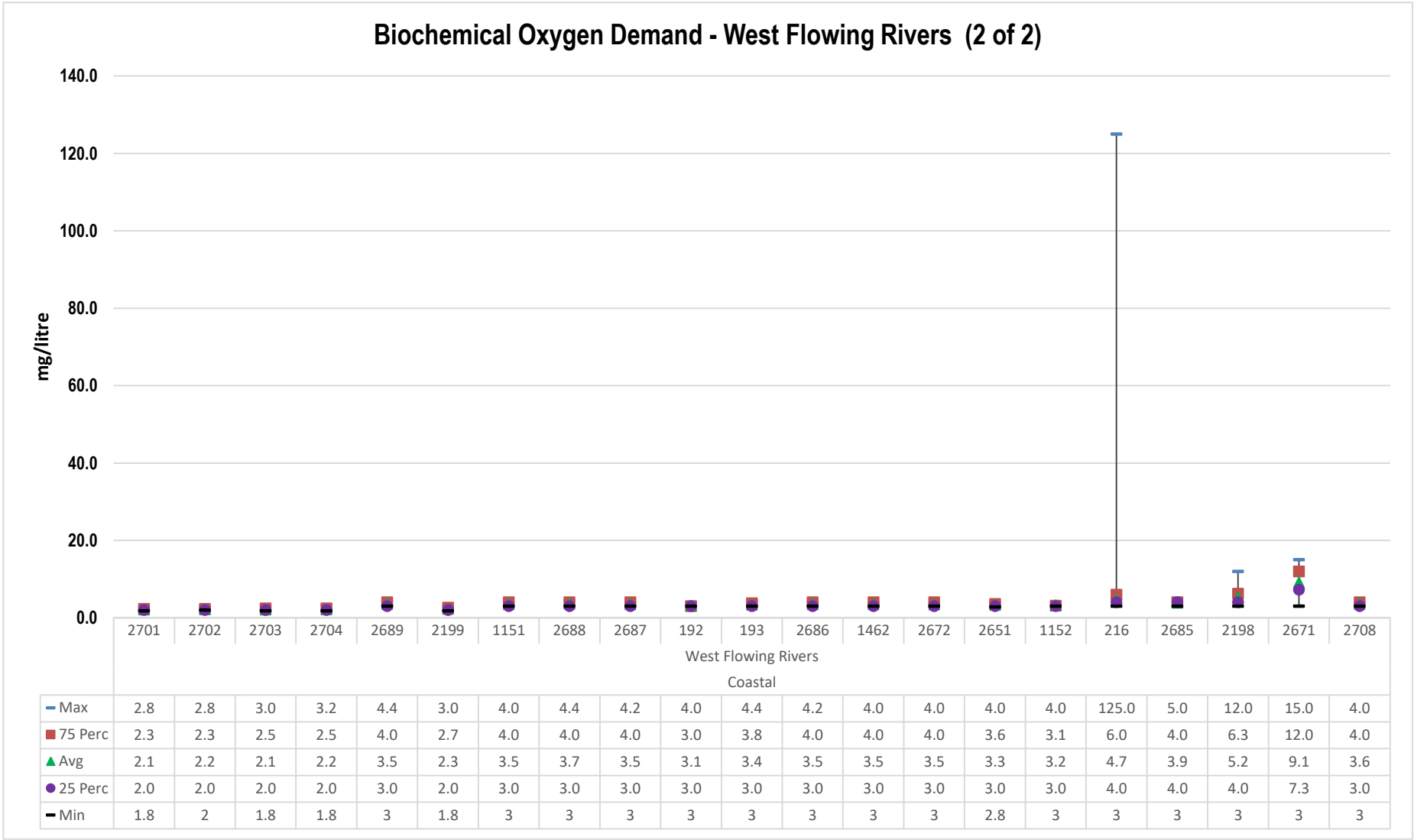
Table No. 24: Surface water monitoring stations at West Flowing Rivers (1 of 2)

Program	Station ID	River	Station Name	Village	Taluka	District
NWMP	2654	Bhatsa	Bhatsa at D/s of Liberty Oil Mills	Satne	Shahapur	Thane
NWMP	2653	Bhatsa	Bhatsa at D/s of Liberty Oil Mills	Satne	Shahapur	Thane
NWMP	1094	Ulhas	Ulhas at U/s of Badlapur water works	Kulgaon	Ambernath	Thane
NWMP	1093	Ulhas	Ulhas at U/s of NRC Bund	Mohane	Kalyan	Thane
NWMP	2162	Ulhas	Ulhas at Jambhul water works	Jambhul	Ambernath	Thane
NWMP	1461	Bhatsa	Bhatsa at D/s of Pise Dam	Pise	Bhiwandi	Thane
NWMP	1092	Kalu	Kalu at Atale village	Atale	Kalyan	Thane
NWMP	2712	Vaitarna	Vaitarna near Road Bridge	Gandhare	Wada	Thane
NWMP	2709	Tansa	Tansa near road bridge	Dakewali	Wada	Thane
NWMP	2707	Surya	Surya at MIDC pumping station	Garvashet	Palghar	Thane
NWMP	2706	Surya	Surya U/s of Surya Dam	Dhamni	Vikramgad	Thane
NWMP	2696	Pelhar	Pelhar dam	Pelhar	Vasai	Palghar
NWMP	2168	Mithi	Mithi at near bridge	Mahim	Bandra	Mumbai
NWMP	2714	Vashishti	Vashishti at U/s of Pophali near Konphansawane Bridge	Pophali	Chiplun	Ratnagiri
NWMP	2676	Muchkundi	Muchkundi at Waked Ratnagiri near M/s Asahi India Glass	Waked	Lanja	Ratnagiri
SWMP	202	Vashisti	Vashisti At Khadpoli, Taluka Chiplun, District - Ratnagiri	Khadpoli	Chiplun	Ratnagiri
NWMP	2164	Vashishti	Vashishti at U/s of Three M Paper Mills near M/s Multifilms Plastic Pvt Ltd	Kherdi	Chiplun	Ratnagiri
NWMP	2713	Vashishti	Vashishti at D/s of Three M Paper Mills near Chiplun water intake Jackwell	Kherdi	Chiplun	Ratnagiri
SWMP	201	Sonpatra	Sonpatra At Kotwali Village, Taluka - Khed, District - Ratnagiri	Kotwali	Khed	Ratnagiri
SWMP	203	Jagbudi	Jagbudi , D/S of Khed City, Taluka - Khed, District Ratnagiri	Khed City	Khed	Ratnagiri
SWMP	204	Jog	Jog at Dapoli, Taluka Dapoli, District - Rantnagiri	Dapoli	Dapoli	Ratnagiri



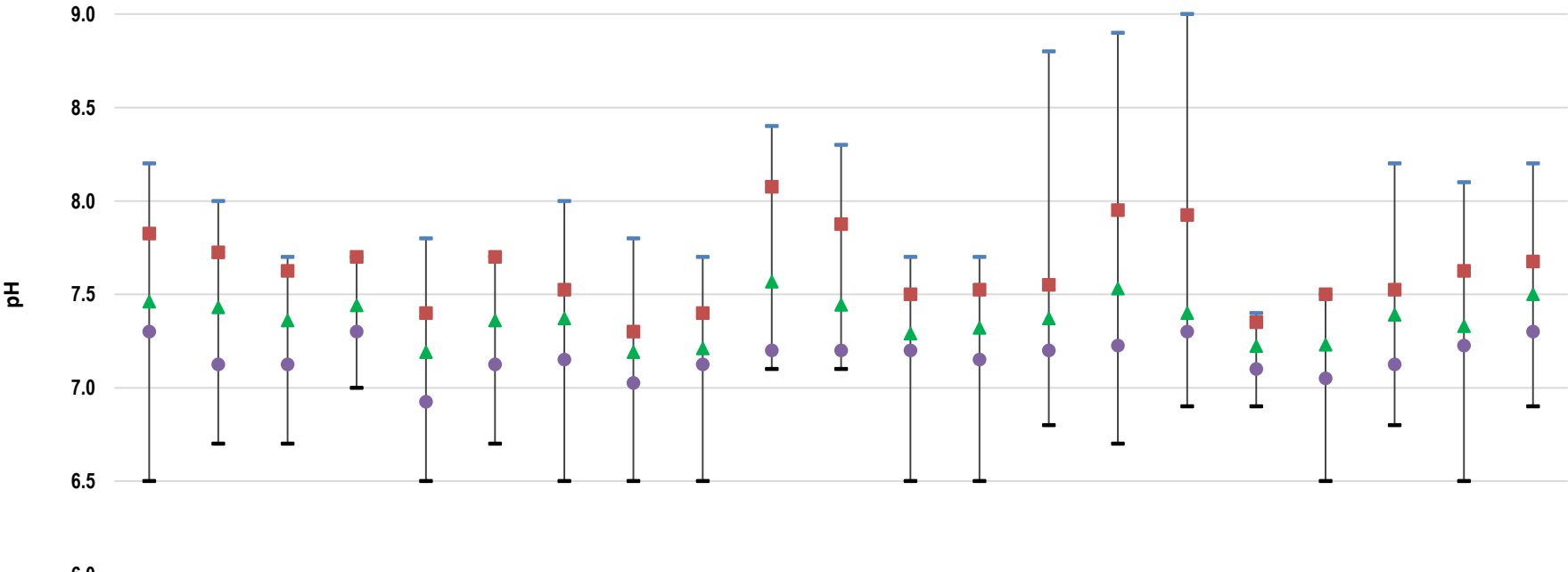
	2701	2702	2703	2704	2689	2199	1151	2688	2687	192	193	2686	1462	2672	2651	1152	216	2685	2198	2671	2708
	West Flowing Rivers																				
	Coastal																				
Max	6.9	6.8	6.9	6.9	7.2	6.9	7.3	7.4	7.3	7.5	7.5	7.4	7.2	7.7	7.7	7.6	7.3	7.2	7.2	7.4	7.6
75 Perc	6.6	6.7	6.8	6.8	7.2	6.8	7.2	7.2	7.3	7.4	7.3	7.2	7.0	7.4	7.4	7.5	6.6	6.9	6.8	4.6	7.4
Avg	6.4	6.4	6.5	6.4	6.8	6.4	6.8	6.7	6.8	7.2	6.9	6.9	6.8	7.3	7.2	7.2	6.2	6.7	6.2	4.8	7.2
25 Perc	6.3	6.4	6.2	6.2	6.5	6.1	6.5	6.4	6.6	7.1	6.5	6.6	6.7	7.0	7.1	7.1	6.0	6.5	5.7	4.3	7.0
Min	5.2	5.8	5.6	5.2	5.8	5.4	6.2	5.8	6	6.8	6	6	6.1	6.9	6.3	6.9	1	6	4.2	3.5	6.6

Figure No. 42: Trend of Dissolved Oxygen (DO) levels recorded at WQMS at West flowing rivers (Coastal basin) (2 of 2)



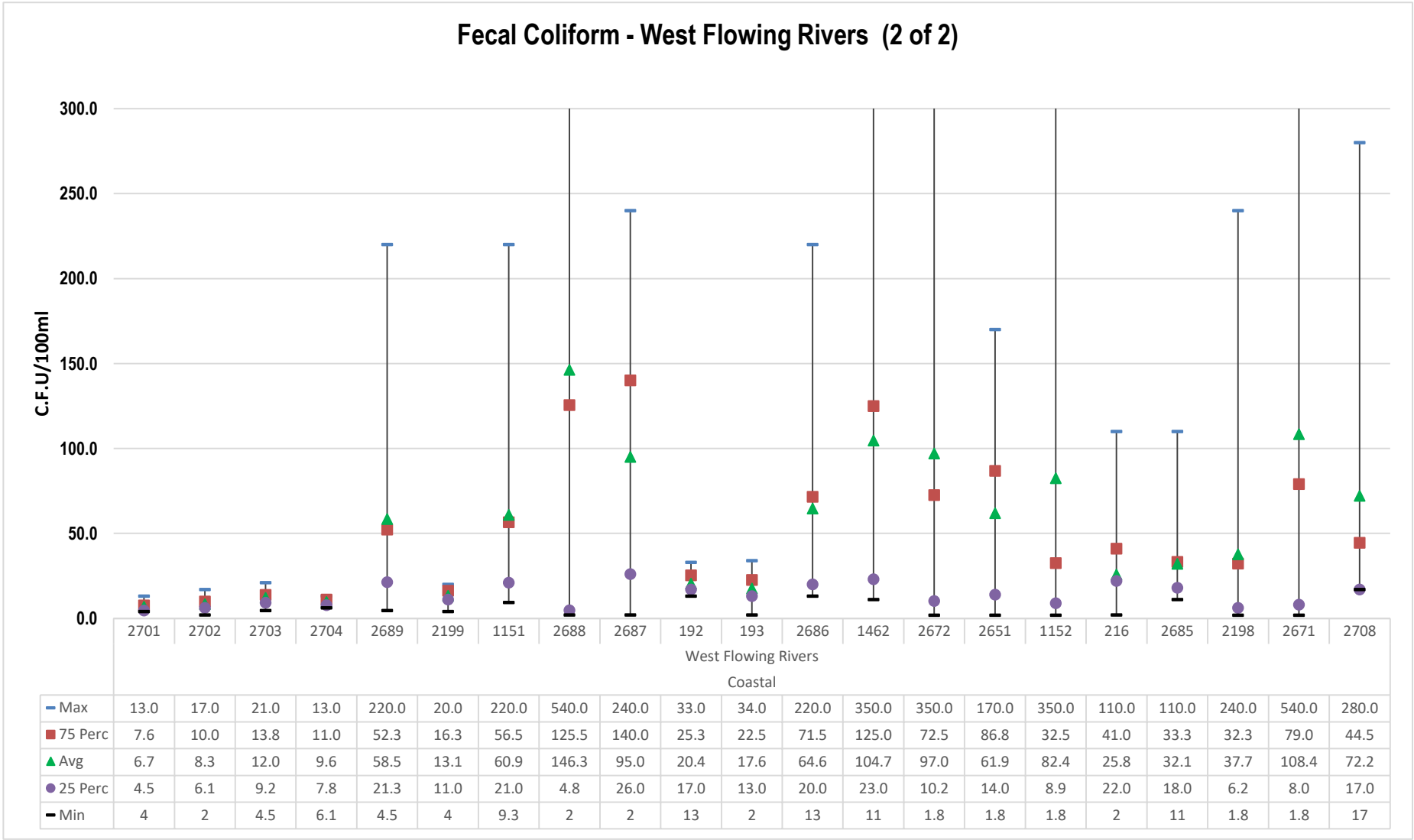
	2701	2702	2703	2704	2689	2199	1151	2688	2687	192	193	2686	1462	2672	2651	1152	216	2685	2198	2671	2708
Max	2.8	2.8	3.0	3.2	4.4	3.0	4.0	4.4	4.2	4.0	4.4	4.2	4.0	4.0	4.0	4.0	125.0	5.0	12.0	15.0	4.0
75 Perc	2.3	2.3	2.5	2.5	4.0	2.7	4.0	4.0	4.0	3.0	3.8	4.0	4.0	4.0	3.6	3.1	6.0	4.0	6.3	12.0	4.0
Avg	2.1	2.2	2.1	2.2	3.5	2.3	3.5	3.7	3.5	3.1	3.4	3.5	3.5	3.5	3.3	3.2	4.7	3.9	5.2	9.1	3.6
25 Perc	2.0	2.0	2.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	7.3	3.0
Min	1.8	2	1.8	1.8	3	1.8	3	3	3	3	3	3	3	3	2.8	3	3	3	3	3	3

Figure No. 43: Trend of Biological Oxygen Demand (BOD) levels recorded at WQMS at West flowing rivers (Coastal basin) (2 of 2)



	2701	2702	2703	2704	2689	2199	1151	2688	2687	192	193	2686	1462	2672	2651	1152	216	2685	2198	2671	2708
	West Flowing Rivers																				
	Coastal																				
Max	8.2	8.0	7.7	7.7	7.8	7.7	8.0	7.8	7.7	8.4	8.3	7.7	7.7	8.8	8.9	9.0	7.4	7.5	8.2	8.1	8.2
75 Perc	7.8	7.7	7.6	7.7	7.4	7.7	7.5	7.3	7.4	8.1	7.9	7.5	7.5	7.6	8.0	7.9	7.4	7.5	7.5	7.6	7.7
Avg	7.5	7.4	7.4	7.4	7.2	7.4	7.4	7.2	7.2	7.6	7.4	7.3	7.3	7.4	7.5	7.4	7.2	7.2	7.4	7.3	7.5
25 Perc	7.3	7.1	7.1	7.3	6.9	7.1	7.2	7.0	7.1	7.2	7.2	7.2	7.2	7.2	7.2	7.3	7.1	7.1	7.1	7.2	7.3
Min	6.5	6.7	6.7	7	6.5	6.7	6.5	6.5	6.5	7.1	7.1	6.5	6.5	6.8	6.7	6.9	6.9	6.5	6.8	6.5	6.9

Figure No. 44: Trend of pH levels recorded at WQMS at West flowing rivers (Coastal basin) (2 of 2)



	2701	2702	2703	2704	2689	2199	1151	2688	2687	192	193	2686	1462	2672	2651	1152	216	2685	2198	2671	2708
Max	13.0	17.0	21.0	13.0	220.0	20.0	220.0	540.0	240.0	33.0	34.0	220.0	350.0	350.0	170.0	350.0	110.0	110.0	240.0	540.0	280.0
75 Perc	7.6	10.0	13.8	11.0	52.3	16.3	56.5	125.5	140.0	25.3	22.5	71.5	125.0	72.5	86.8	32.5	41.0	33.3	32.3	79.0	44.5
Avg	6.7	8.3	12.0	9.6	58.5	13.1	60.9	146.3	95.0	20.4	17.6	64.6	104.7	97.0	61.9	82.4	25.8	32.1	37.7	108.4	72.2
25 Perc	4.5	6.1	9.2	7.8	21.3	11.0	21.0	4.8	26.0	17.0	13.0	20.0	23.0	10.2	14.0	8.9	22.0	18.0	6.2	8.0	17.0
Min	4	2	4.5	6.1	4.5	4	9.3	2	2	13	2	13	11	1.8	1.8	1.8	2	11	1.8	1.8	17

Figure No. 45: Trend of Fecal Coliform recorded at WQMS at West flowing rivers (Coastal basin) (2 of 2)

Water Quality Index of WQMS on West Flowing rivers (Coastal basin) (2 of 2)

Apr	89	87	89	88	79	87	77	77	80	Dry	Dry	80	76	83	80	78	35	78	69	59	74
May	NA	NA	NA	NA	81	NA	82	81	82	74	74	83	82	74	72	69	38	81	66	52	79
Jun	80	84	79	81	73	79	86	88	78	78	87	83	82	89	81	91	91	81	83	70	64
Jul	87	83	86	86	77	88	80	80	78	83	86	78	76	82	74	79	73	78	79	56	71
Aug	85	89	90	88	85	87	86	92	85	82	83	84	84	83	85	92	79	84	86	74	76
Sep	86	88	86	89	79	85	73	80	74	78	82	74	78	72	73	71	82	81	81	67	82
Oct	89	87	87	86	75	85	80	72	73	83	83	79	77	72	74	73	82	79	77	60	82
Nov	NA	NA	NA	NA	87	NA	79	78	80	80	84	79	88	83	84	84	79	81	81	55	84
Dec	87	87	85	85	79	84	79	70	77	83	81	76	73	76	83	82	75	82	74	77	89
Jan	88	87	86	86	74	78	77	72	76	83	83	77	76	81	76	83	72	77	80	57	91
Feb	87	85	86	88	78	86	78	81	89	78	77	82	75	84	75	80	83	77	65	66	76
Mar	84	84	84	84	84	86	77	88	78	Dry	Dry	92	83	80	80	77	Dry	84	83	75	89
Station Code	2701	2702	2703	2704	2689	2199	1151	2688	2687	192	193	2686	1462	2672	2651	1152	216	2685	2198	2671	2708
Sub Basin	West Flowing Rivers (2 of 2)																				
Basin	Coastal																				

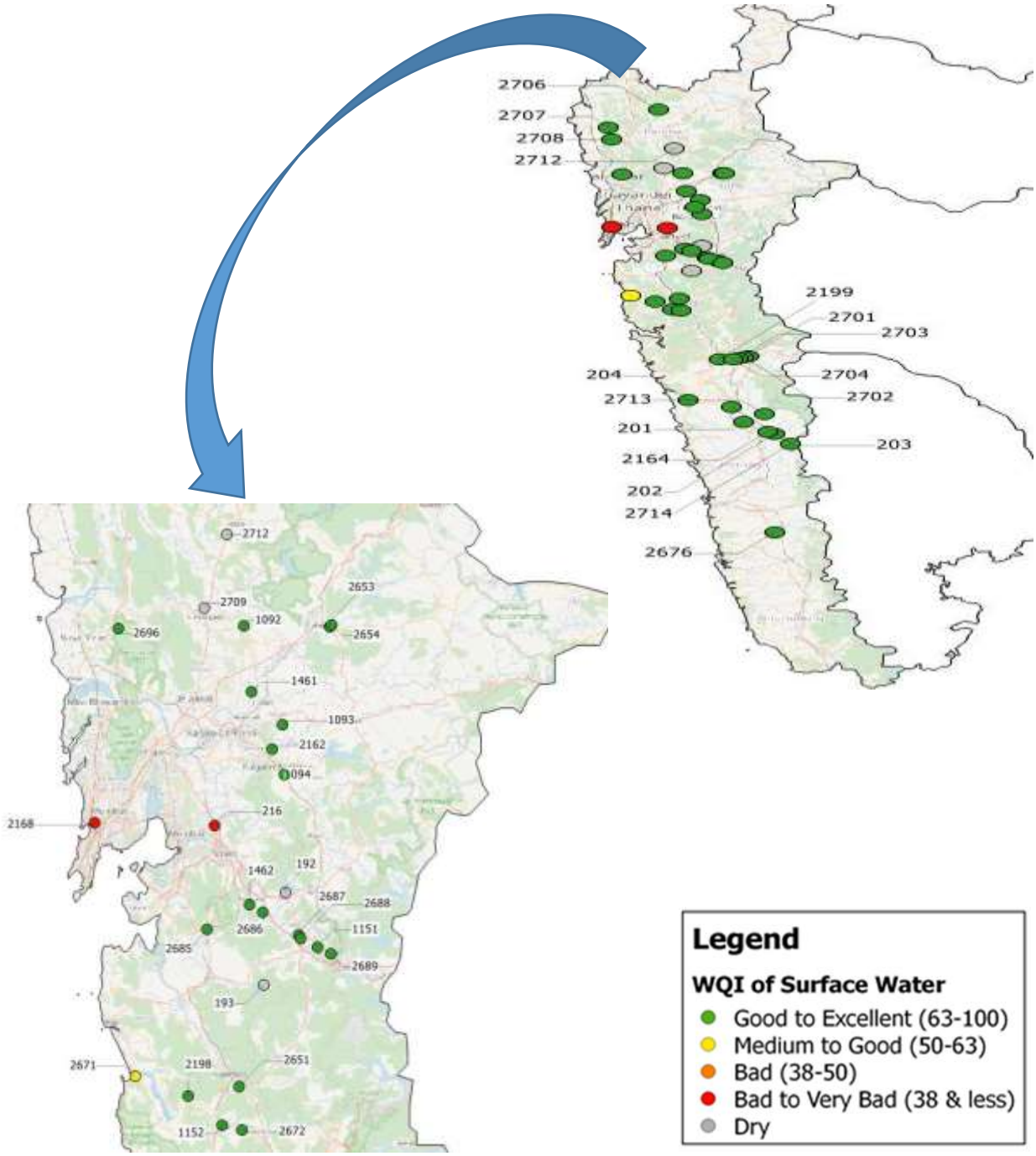
Legend

Good to Excellent	Medium to good	Bad	Bad to Very Bad	Dry	NA

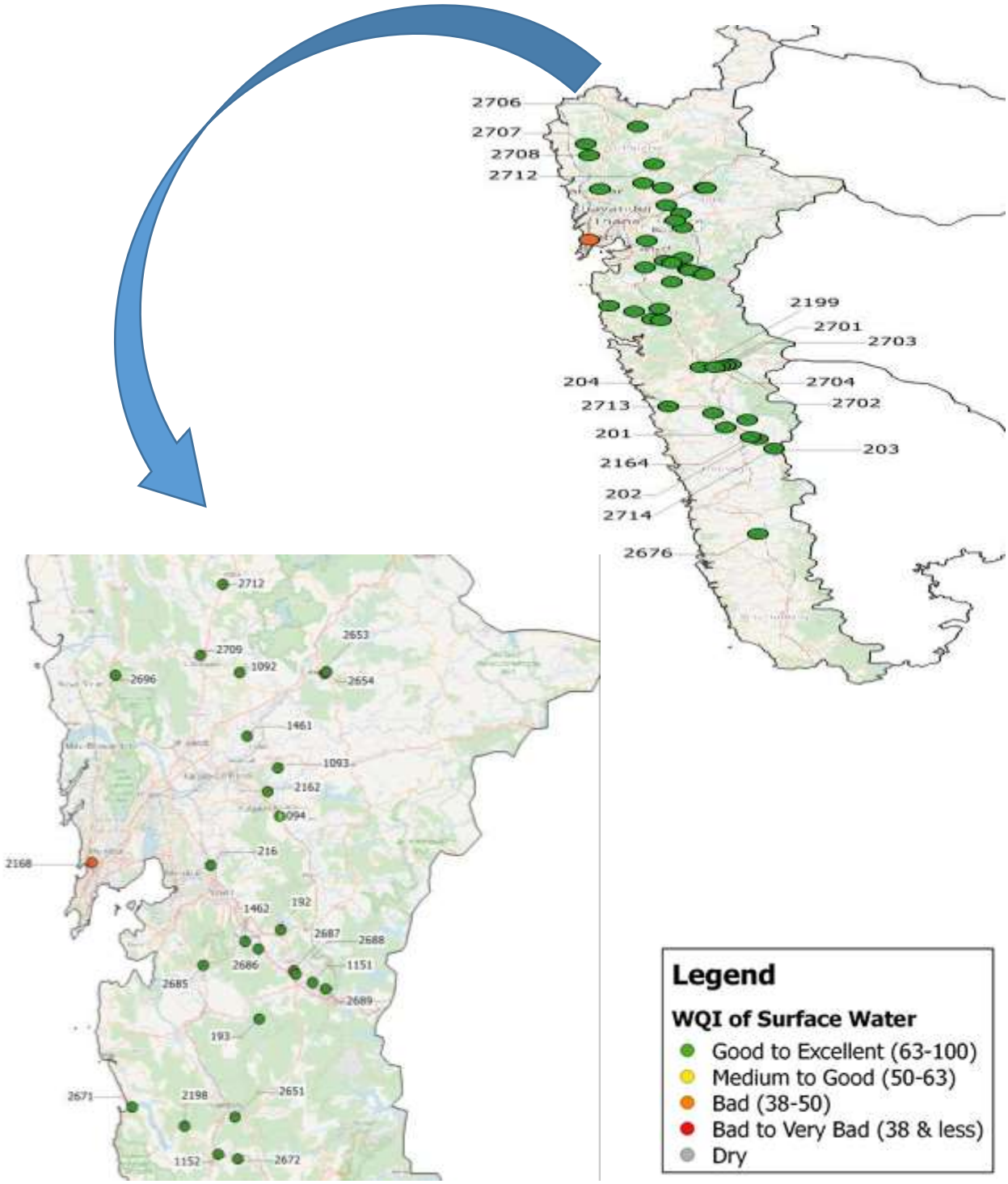
Table No. 25: **Surface water quality monitoring stations on West flowing rivers (2 of 2)**

Program	Station ID	River	Station Name	Village	Taluka	District
NWMP	2701	Savitri	Savitri Jackwell at Upsa kendra	Nangalwadi	Mahad	Raigad
NWMP	2702	Savitri	Savitri at Shedav Doh	Shedav Dov	Mahad	Raigad
NWMP	2703	Savitri	Savitri at Dadli Bridge	Dadli	Mahad	Raigad
NWMP	2704	Savitri	Savitri at Muthavali village	Muthavali	Mahad	Raigad
NWMP	2689	Patalganga	Patalganga at Gagangiri Maharaj Temple	Khopoli	Khalapur	Raigad
NWMP	2199	Savitri	Savitri at Ovale village	Ovale	Mahad	Raigad
NWMP	1151	Patalganga	Patalganga at Shilphata Bridge	Khopoli	Khalapur	Raigad
NWMP	2688	Patalganga	Patalganga at Savroli Bridge	Savroli	Khalapur	Raigad
NWMP	2687	Patalganga	Patalganga at Khalapur pumping house	Khalapur	Khalapur	Raigad
SWMP	192	Dam	Morbe Dam, Taluka - Khalapur, District - Raigad	Khalapur	Khalapur	Raigad
SWMP	193	Balganga	Balganga , Village Ransai, Taluka - Khalapur, District - Raigad	Ransai	Khalapur	Raigad
NWMP	2686	Patalganga	Patalganga at Vyal pump house	Vyal	Khalapur	Raigad
NWMP	1462	Patalganga	Patalganga near intake of MIDC water works(Turade w/w)	Turade	Khalapur	Raigad
NWMP	2672	Kundalika	Kundalika at Dhatav at Jackwell	Dhatav	Roha	Raigad
NWMP	2651	Amba	Amba at D/s of Waken Bridge	Waken Phata	Roha	Raigad
NWMP	1152	Kundalika	Kundalika at Roha Bridge	Roha	Roha	Raigad
SWMP	216	Kasardi	Near Ganesh Ghat	Taloja	Panvel	Raigad
NWMP	2708	Surya	Surya at Intake of Vasai-Virar water scheme	Masvan	Palghar	Thane
NWMP	2685	Patalganga	Patalganga at D/s of Kharpada Bridge	Kharpada	Khalapur	Raigad
NWMP	2198	Kundalika	Kundalika at Are Khurd (Saline Zone)	Are Khurd	Roha	Raigad
NWMP	2671	Kundalik	Kundalika near Salav Bridge (Saline Zone)	Salav	Roha	Raigad

Spatial map of Surface WQI of West Flowing rivers (April 2019)

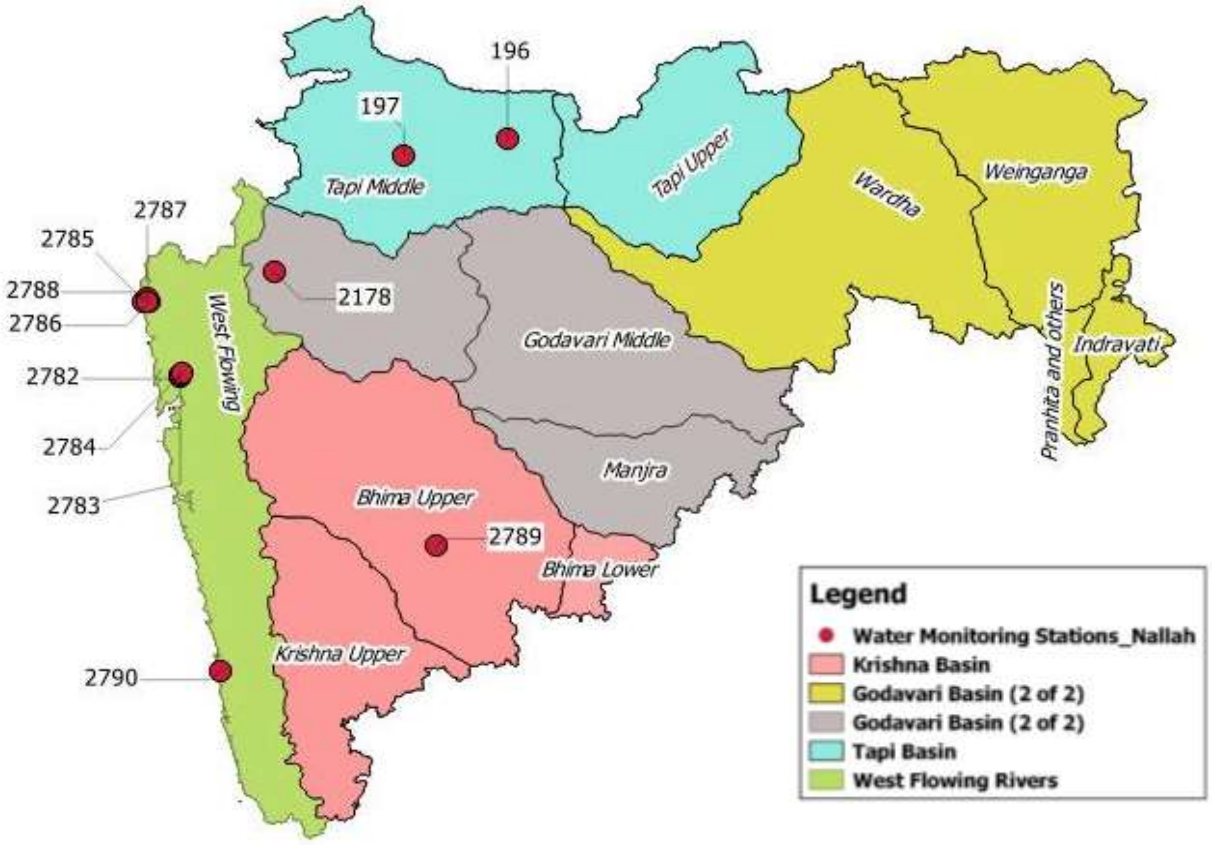


Spatial map of Surface WQI of West Flowing rivers (December 2019)

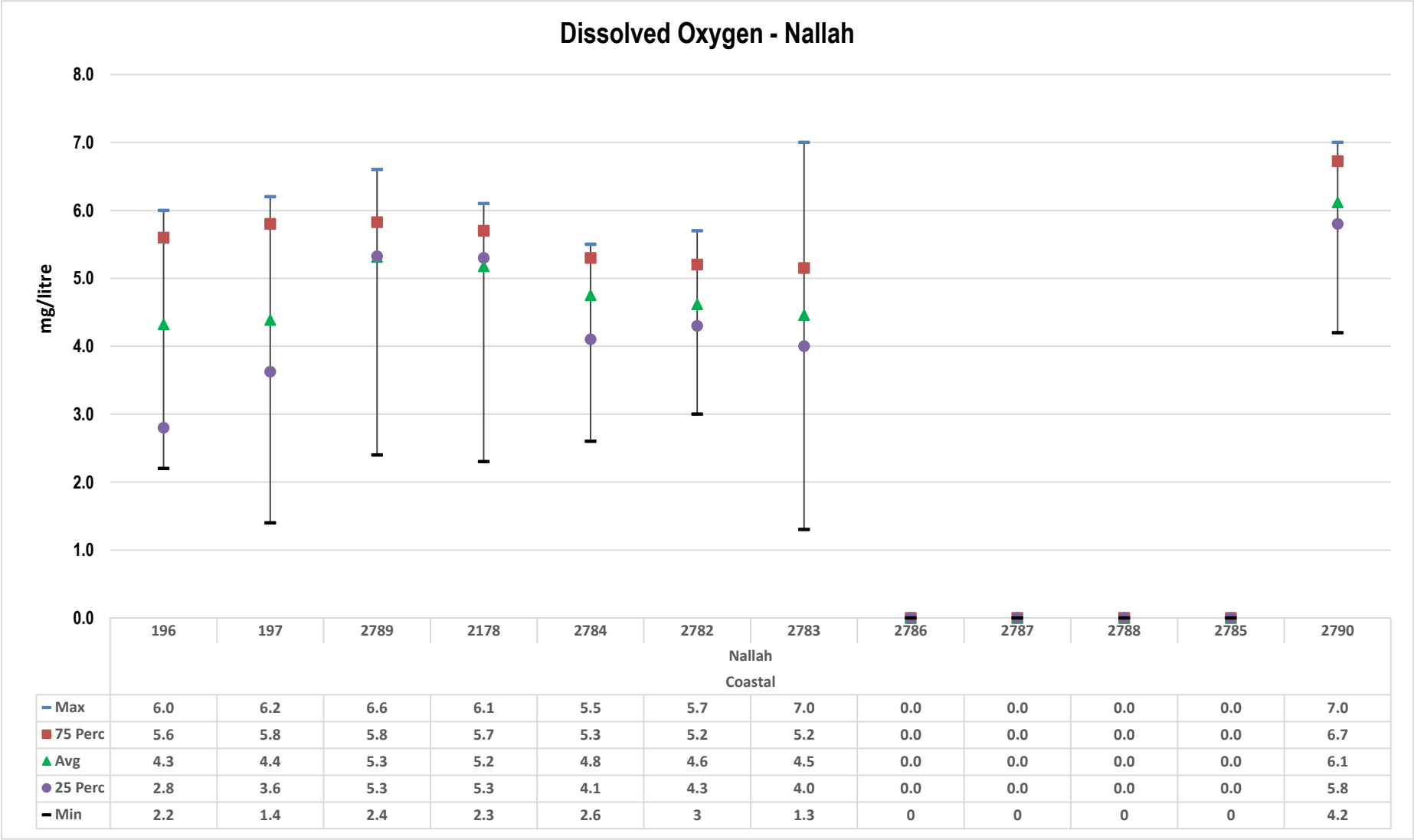


Nallahs

In Maharashtra state, there are total 12 water quality monitoring stations installed across nallahs. The majority of these nallahs are located in coastal belt primarily in Thane district. Out of these, Sandoz nallah, BPT Navpur mallah and Rabodi Nallah are some of the major nallahs which remains polluted throughout the year due to high pollution load from nearby settlements and industries.

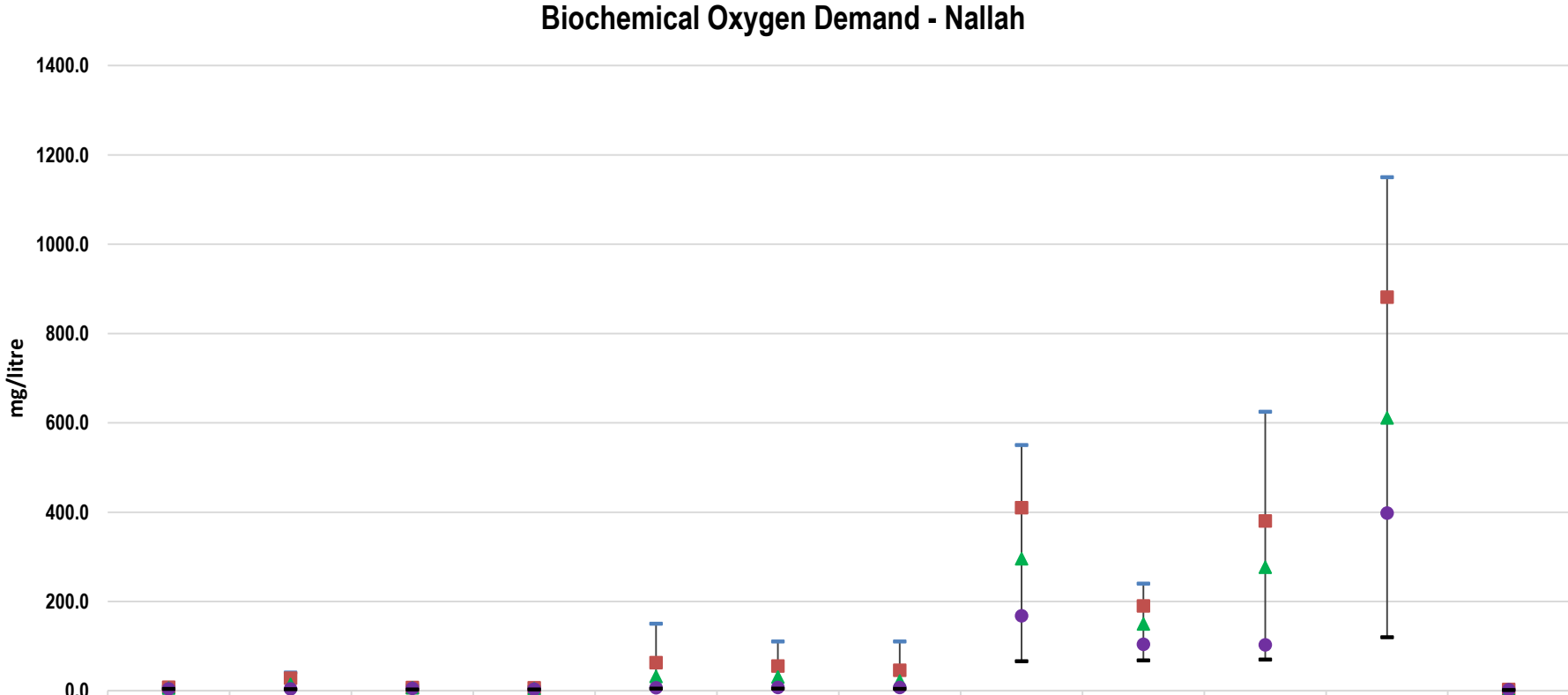


Map No. 9: Network of surface water quality monitoring stations on Nallahs



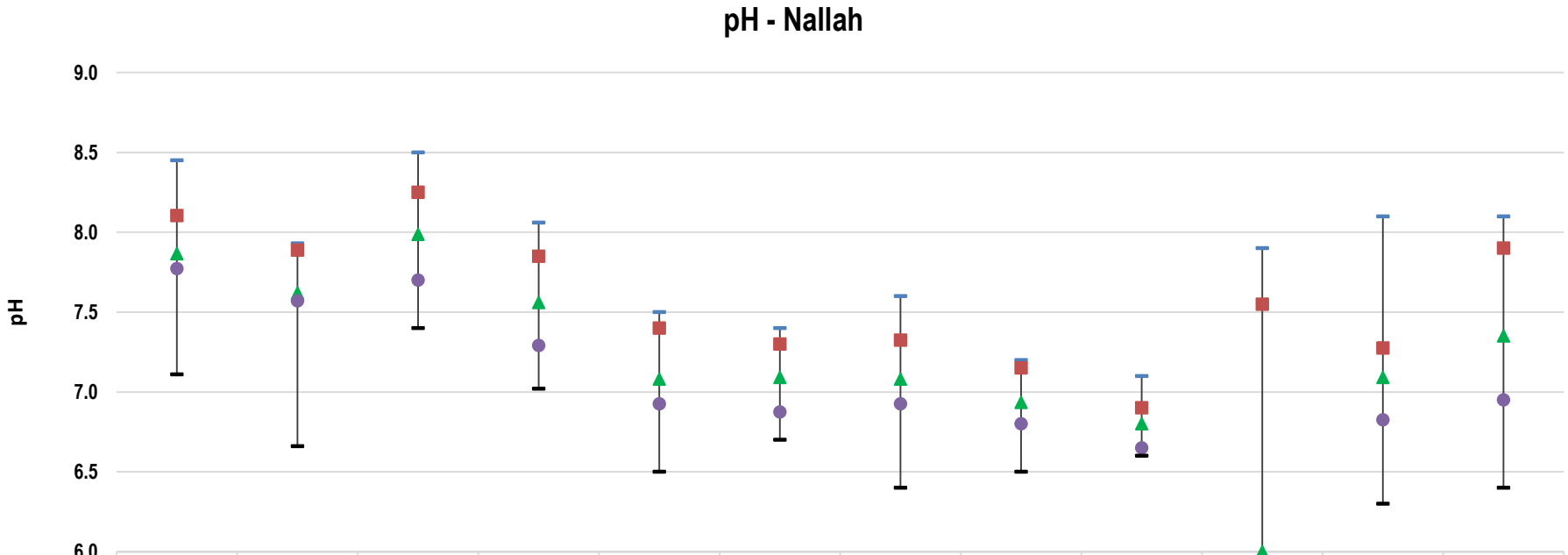
	196	197	2789	2178	2784	2782	2783	2786	2787	2788	2785	2790
Max	6.0	6.2	6.6	6.1	5.5	5.7	7.0	0.0	0.0	0.0	0.0	7.0
75 Perc	5.6	5.8	5.8	5.7	5.3	5.2	5.2	0.0	0.0	0.0	0.0	6.7
Avg	4.3	4.4	5.3	5.2	4.8	4.6	4.5	0.0	0.0	0.0	0.0	6.1
25 Perc	2.8	3.6	5.3	5.3	4.1	4.3	4.0	0.0	0.0	0.0	0.0	5.8
Min	2.2	1.4	2.4	2.3	2.6	3	1.3	0	0	0	0	4.2

Figure No. 46: Trend of Dissolved Oxygen (DO) levels recorded at WQMS at Nallah (Coastal basin)



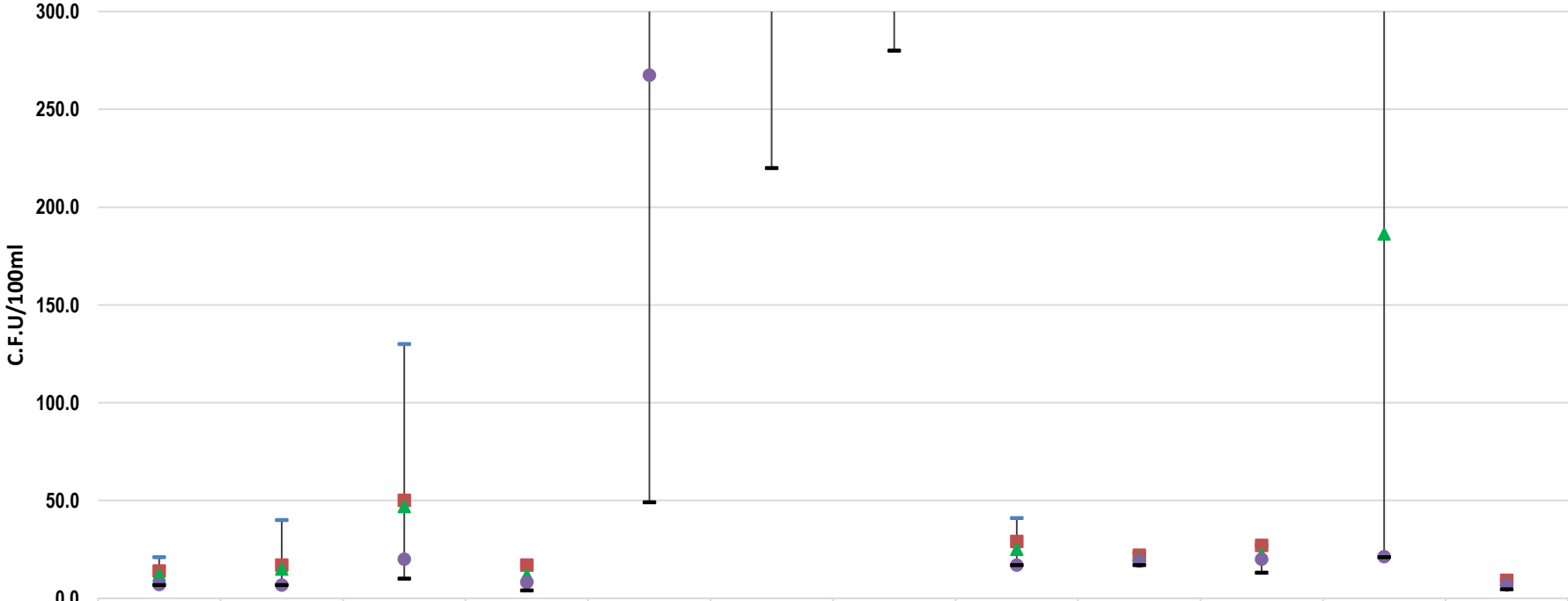
	196	197	2789	2178	2784	2782	2783	2786	2787	2788	2785	2790
Max	9.8	41.0	12.0	8.4	150.0	110.0	110.0	550.0	240.0	625.0	1150.0	3.4
75 Perc	7.9	28.3	7.3	6.4	63.0	55.0	45.8	410.0	190.0	380.0	881.3	2.8
Avg	6.2	14.3	6.7	4.9	31.6	30.8	21.8	295.3	149.3	276.7	610.5	2.3
25 Perc	4.1	3.8	5.5	3.8	6.5	7.3	7.3	168.0	104.0	102.5	397.5	2.0
Min	3.8	3.4	2.6	3	5	5	4	66	68	70	120	1.8

Figure No. 47: Trend of Biological Oxygen Demand (BOD) levels recorded at WQMS at Nallah (Coastal basin)



	196	197	2789	2178	2784	2782	2783	2786	2787	2788	2785	2790
Max	8.5	7.9	8.5	8.1	7.5	7.4	7.6	7.2	7.1	7.9	8.1	8.1
75 Perc	8.1	7.9	8.3	7.9	7.4	7.3	7.3	7.2	6.9	7.6	7.3	7.9
Avg	7.9	7.6	8.0	7.6	7.1	7.1	7.1	6.9	6.8	6.0	7.1	7.4
25 Perc	7.8	7.6	7.7	7.3	6.9	6.9	6.9	6.8	6.7	5.1	6.8	7.0
Min	7.11	6.66	7.4	7.02	6.5	6.7	6.4	6.5	6.6	2.9	6.3	6.4

Figure No. 48: Trend of pH levels recorded at WQMS at Nallah (Coastal basin)



	196	197	2789	2178	2784	2782	2783	2786	2787	2788	2785	2790
Max	21.0	40.0	130.0	17.0	1600.0	1600.0	1600.0	41.0	23.0	27.0	1600.0	9.2
75 Perc	14.0	17.0	50.0	17.0	1090.0	1600.0	920.0	29.0	22.0	27.0	434.5	9.2
Avg	12.0	14.9	46.9	11.8	670.9	1095.0	840.0	25.0	20.3	22.3	186.3	7.6
25 Perc	7.0	6.8	20.0	8.1	267.5	635.0	397.5	17.0	19.0	20.0	21.3	6.8
Min	6.8	6.8	10	4	49	220	280	17	17	13	21	4.5

Figure No. 49: Trend of Fecal Coliform levels recorded at WQMS at Nallah (Coastal basin)

Water Quality Index for WQMS at Nallah (Coastal basin)

Apr	25	24	25	Dry	Dry	Dry	25	87	Dry	Dry	Dry	Dry
May	35	28	28	Dry	Dry	Dry	22	83	Dry	46	Dry	76
Jun	22	24	21	Dry	Dry	Dry	20	80	Dry	19	Dry	Dry
Jul	66	61	63	35	36	37	34	88	Dry	58	Dry	79
Aug	66	58	62	37	35	39	38	Dry	Dry	44	49	75
Sep	73	66	71	40	39	25	38	Dry	59	69	81	82
Oct	48	42	47	Dry	Dry	Dry	34	Dry	71	79	63	79
Nov	55	63	55	Dry	Dry	Dry	36	Dry	31	80	69	75
Dec	51	52	51	Dry	Dry	Dry	39	88	82	85	65	85
Jan	28	23	25	Dry	Dry	Dry	35	87	47	49	79	57
Feb	26	27	26	Dry	Dry	Dry	34	82	72	77	63	71
Mar	29	26	34	Dry	Dry	Dry	37	71	Dry	Dry	75	Dry
Station Code	2784	2782	2783	2786	2787	2788	2785	2790	196	197	2789	2178
Sub Basin	Nallah											
Basin	Nallah											

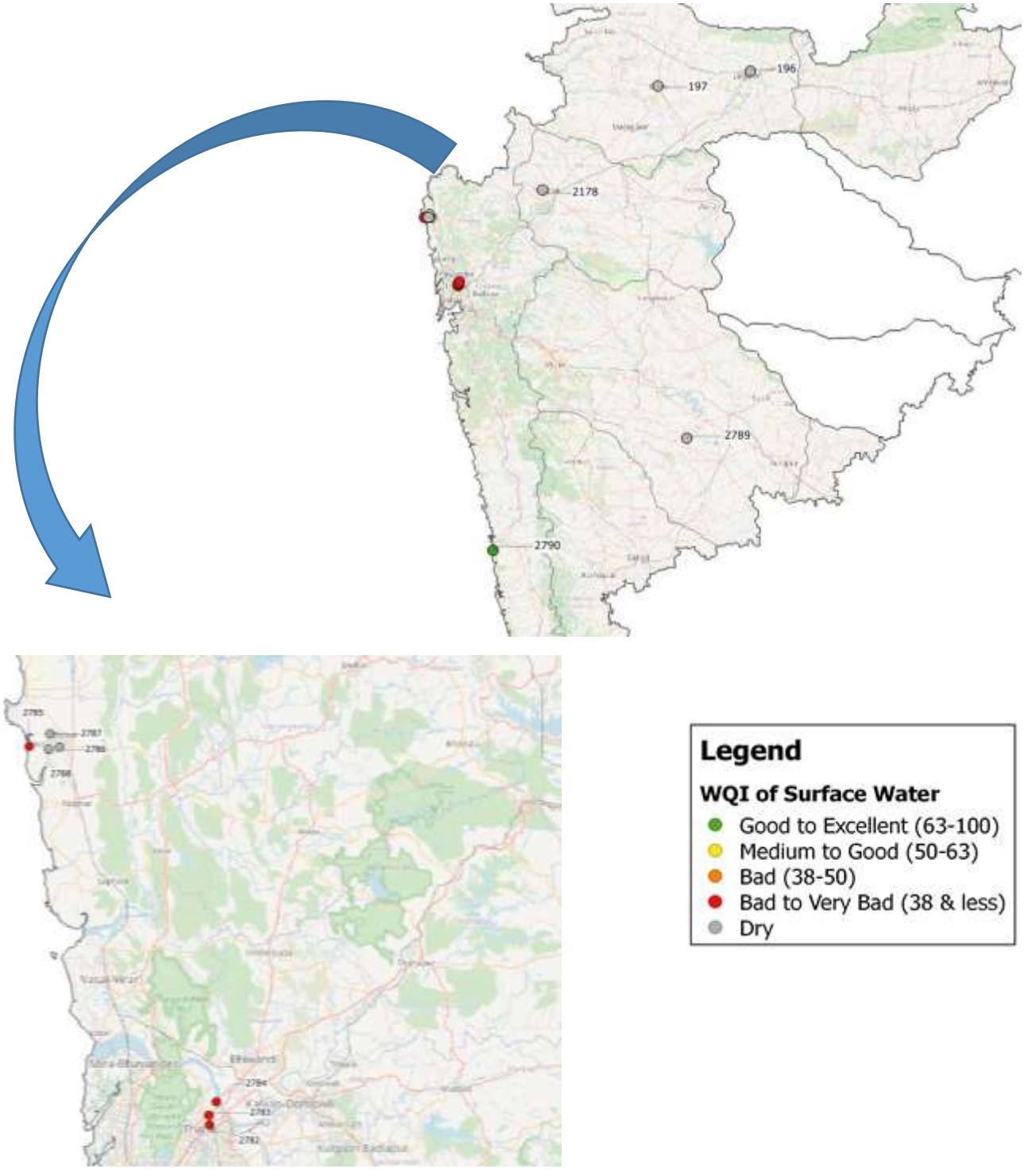
Legend

Good to Excellent	Medium to good	Bad	Bad to Very Bad	Dry	NA

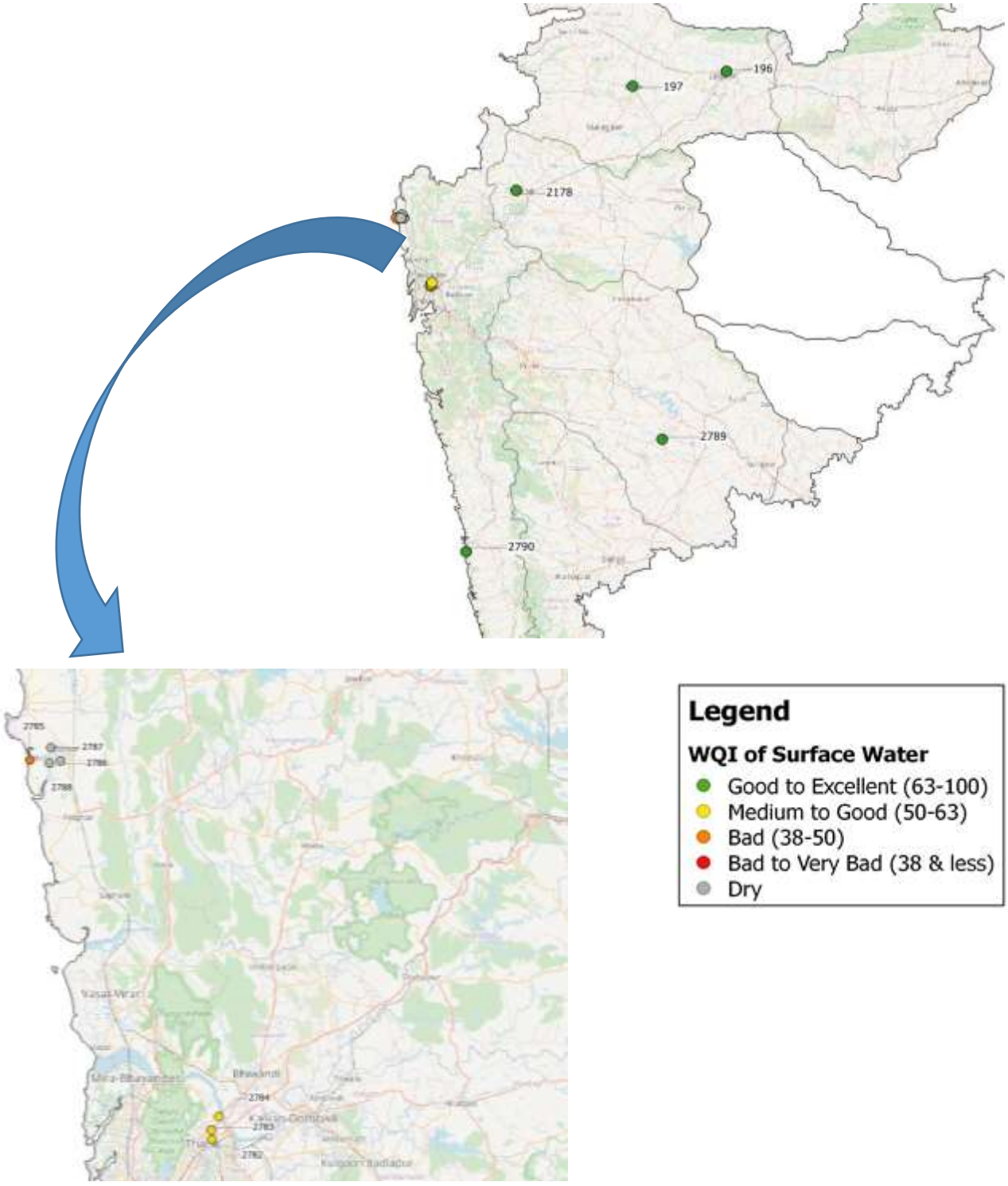
Table No. 26: Surface water monitoring stations at Nallahs

Program	Station ID	River/Nalla	Station Name	Village	Taluka	District
SWMP	196	Lowki Nalla	Lowki Nalla At Khedi, Taluka & District - Jalgaon	Khedi	Khedi	Jalgaon
SWMP	197	Moti Nalla	Moti Nalla before Confluence with Panjara Dhule, Taluka & District - Dhule	Dhule	Dhule	Dhule
NWMP	2178	Chikhali nalla	Chikhali Nalla Meets Godavari	Chikhali	Nashik	Nashik
NWMP	2789	Nalla	Nalla at D/s of Alkai Mandir, Solapur	Aklai	Malshiras	Solapur
NWMP	2784	Sandoz nalla	Sandoz Nalla	Sandozbaug	Thane	Thane
NWMP	2782	Rabodi nalla	Rabodi Nalla	Rabodi	Thane	Thane
NWMP	2783	Colour Chem nalla	Colour Chem Nalla	Majiwada	Thane	Thane
NWMP	2786	Tarapur MIDC nalla	Tarapur MIDC Nalla, near sump No1	MIDC Tarapur	Palghar	Palghar
NWMP	2787	Tarapur MIDC nalla	Tarapur MIDC Nalla	MIDC Tarapur	Palghar	Palghar
NWMP	2788	Tarapur MIDC nalla	Tarapur MIDC Nalla near sump-III	MIDC Tarapur	Palghar	Palghar
NWMP	2785	BPT Navapur	BPT Navapur	Navapur	Palghar	Palghar
NWMP	2790	Pimpal-Paneri nalla	Pimpal-Paneri Nalla at Ratnagiri near Finolex Industries	Yahganigaon	Ratnagiri	Ratnagiri

Spatial map of Surface WQI of Nallahs (April 2019)



Spatial map of Surface WQI of Nallahs (Dec 2019)



Saline (Sea and Creek) Water Quality

There is a great variety in coastal landforms of India which has a length spanning over 7,517 km which is seventh largest in the world. These landfroms are either rock based (sea cliffs, shore platforms), sediment based (beaches, tidalflats, sand bars) or coral based (reefs and atolls); all of which varies significantly based on spatial scale and form. Nearly 43% (lengthwise) of Indian coast have sandy beaches followed by rocky (11%) and mud flats/marshy wetlands (46%)[27]. The coastline supports a huge human population and creates tremendous livelihood opportunities primarily fishing, shipping and tourism industries. Along with this, coastal habitat itself is a type of eco system which supports a wide array of flora and fauna.

Despite ecological richness and its contribution to the nation's economy, India's coastal and marine environments are threatened by unplanned development, rapid industrialization and urbanization, as well as growing pressure from anthropogenic activities. The Indian coastline has witnessed rapid industrialization and urbanization along majority of the coastal cities, particularly in the states of Gujarat, Maharashtra, Tamilnadu, and West Bengal. The release of effluents from industries, disposal of municipal solid waste from nearby human settlements & tourists, and disposal of construction and demolition wastes into these ecosystems results in water pollution and causes detrimental impacts on coastal and marine biodiversity.

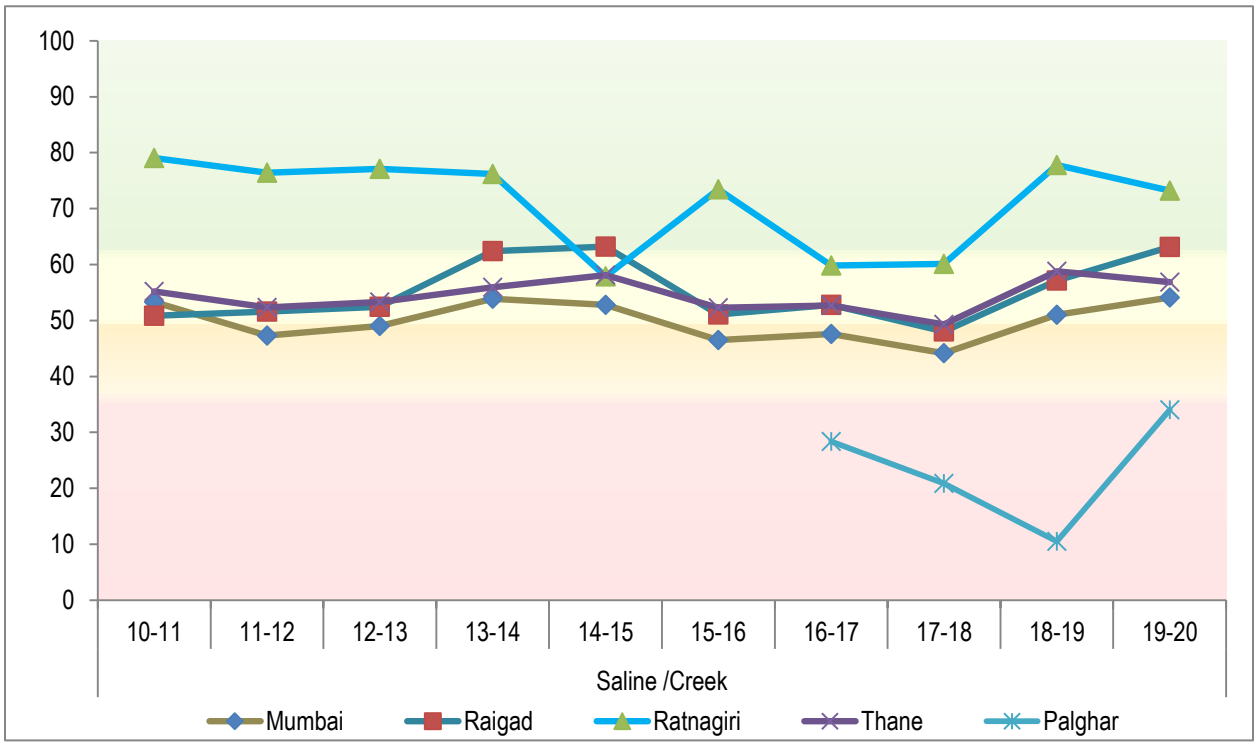
Maharashtra has a coastline of around 720 km, along the Arabian Sea in the west and Western Ghats in the east. The coastal stretch in the state constitutes 7 districts - Mumbai city, Mumbai suburban, Thane, Palghar, Raigad, Ratnagiri and Sindhudurg. This coastline has diverse landforms such as rocky coasts, sandy shores Muddy and Mangrove shores are some of the coastal types found prevalently along with few patches of corals in some places like Malvan[28]. The coastal areas contribute considerably to state's economy by providing opportunities for tourism, fisheries, salt production and other livelihood opportunities for the coastal communities. However, the growing pressure from these activities is a cause of concern as it leads to detrimental impacts on coastal resources in the form of water pollution, biodiversity loss and more; it also affects humans who are dependent on coastal and marine resources. Thus, it is essential to continuously monitor sea water quality.

For monitoring purpose, MPCB has installed 48 monitoring stations (36 along sea/creek especially along the sensitive and pollution prone areas of state's coastline and 12 along the nallahs). Regular monitoring is conducted at these monitoring stations for parameters like DO, FC, pH and BOD. The following section presents an illustrative account of these parameters recorded at the sea and creek WQMS.

[27] https://www.researchgate.net/publication/282800101_The_Indian_Coastline_Processes_and_Landforms

[28] https://www.indiaspend.com/wp-content/uploads/2018/11/National-Assessment-of-Shoreline-Changes-NCCR-report.pdf

Coastal Basin (Sea/Creek water sample)



WQI	Category	Class by CPCB	Remarks
63-100	Good to Excellent	A	Non polluted
50-63	Medium to Good	B	Non polluted
38-50	Bad	C	Polluted
38 & less	Bad to Very Bad	D, E	Heavily polluted

Figure No. 50: Trend of annual average WQI across districts of Coastal basin

Note: This graph considers the average WQI for all the monitoring stations in that particular district and hence may include some bias. This graph is only for an overview and monitoring station wise data maybe analyzed to pin point the most affected and polluted patches of bodies in that district.

The illustration of the intra basin performance of west flowing rivers across 5 districts of the state has been done in Figure No. 50. Improvement in annual average WQI has been recorded by WQMS installed at Mumbai, Raigad and Palghar district as compared to previous year (2018-19)

The annual average WQI recorded at Raigad district has improved from 'Medium to Good' to "Good to Excellent' category while at Ratnagiri, though in 'Good to Excellent' category the WQI has decreased from 78 to 73 in 2019-20. In Palghar district, where annual average WQI was recorded at rockbottom 10.5 in 2018-19 have shown some improvement wherein the WQI has

reached to 34 in 2019-20. Still, however, the water quality remains heavily polluted and it needs serious mitigative measures to be adopted for further improvement in water quality.

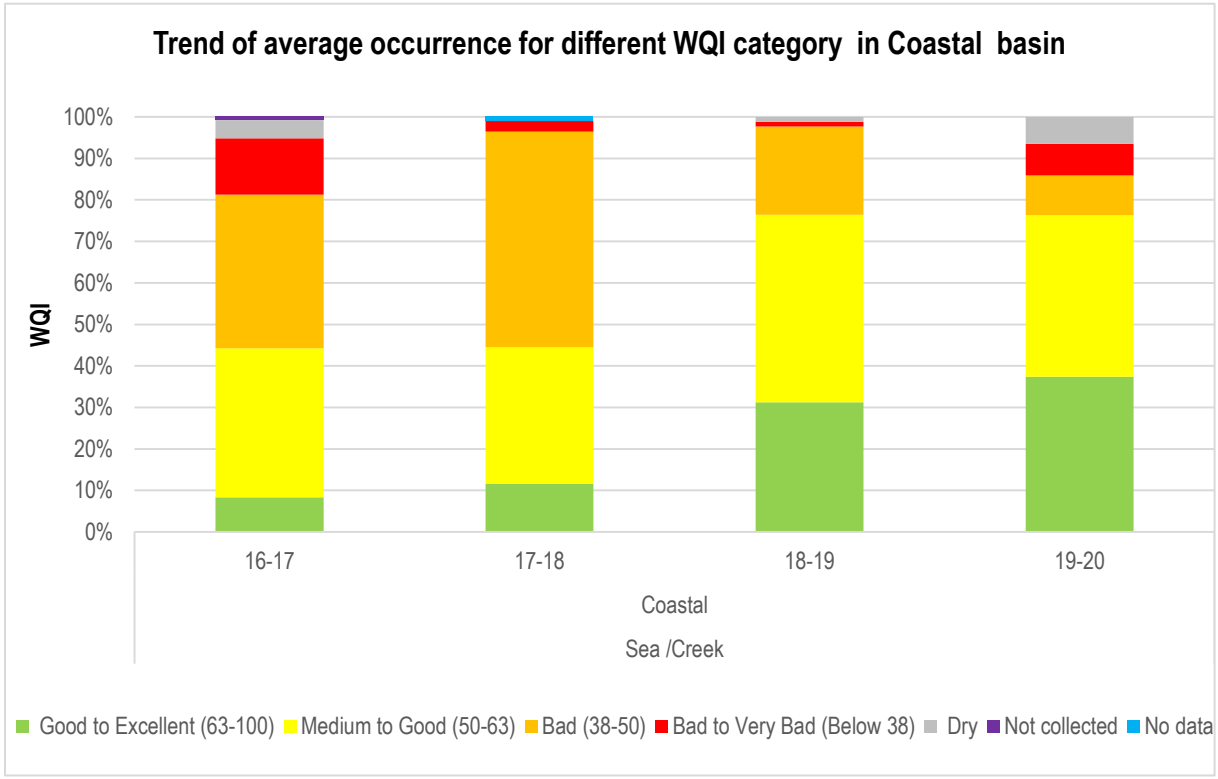
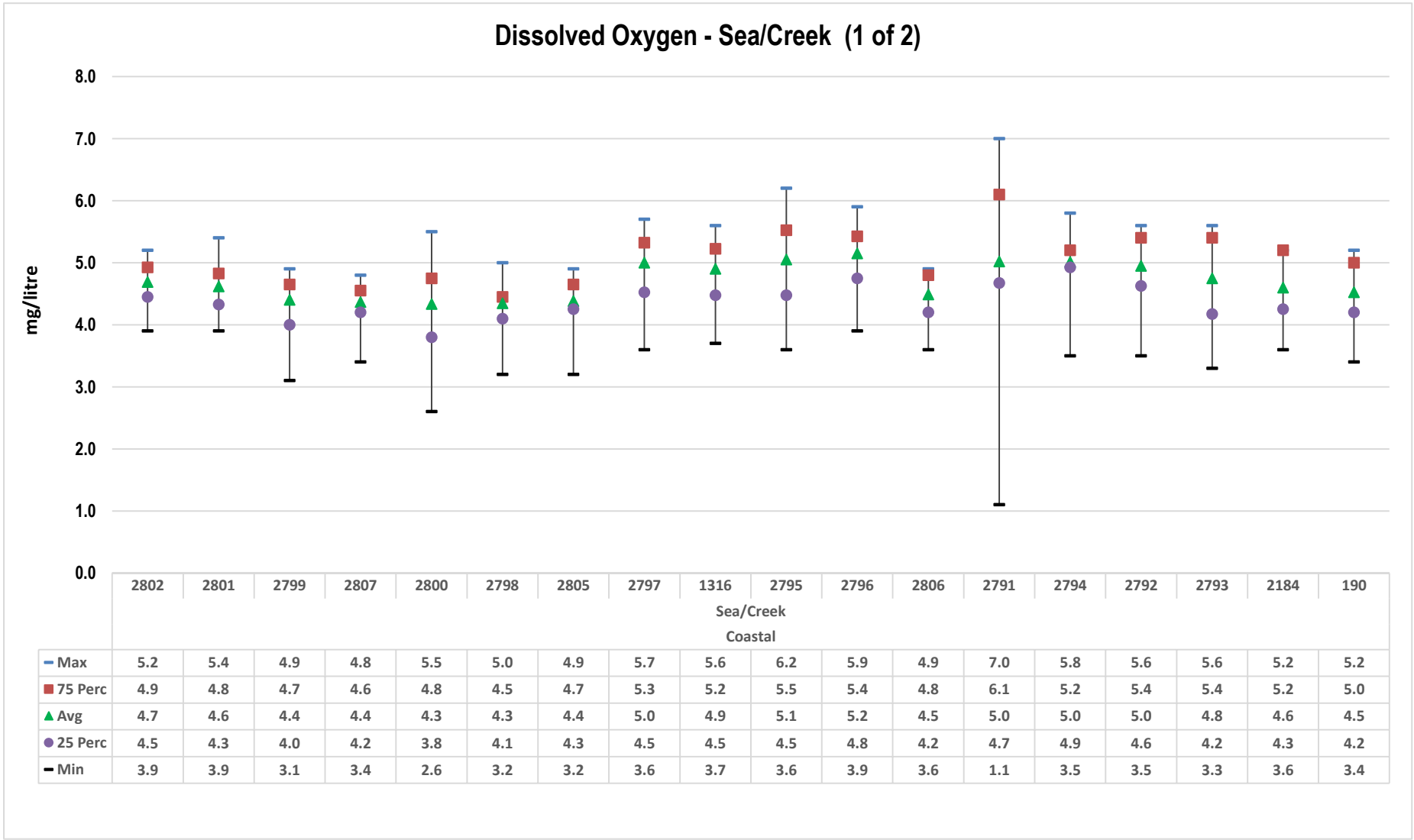


Figure No. 51: Trend of average occurrence for different category of WQI Coastal basin

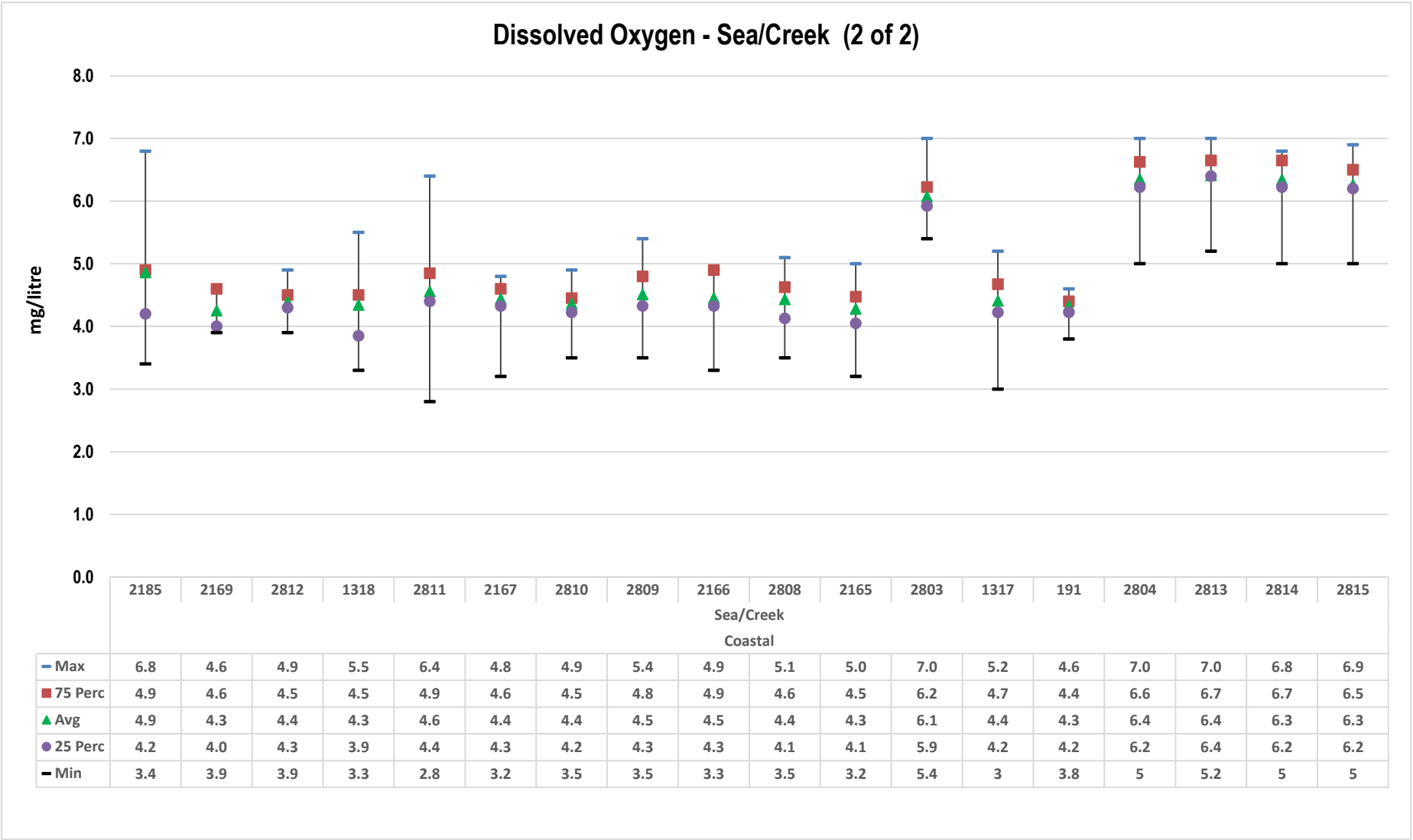
Figure No. 51 indicates slight increase in observations coming under 'Good to Excellent' and 'Bad to Very Bad' categories from 31.2% to 37.4% and from 1.15% to 7.6% respectively. On the contrary, a decreasing trend was observed in case of categories such as 'Medium to Good' (from 45.1% to 38.9%) and 'Bad' (21.3% to 9.6%) in 2019-20.

In case of 'Dry' category, as compared to previous year (1.16%), the share of observations increased to about 6.5% in 2019-20.



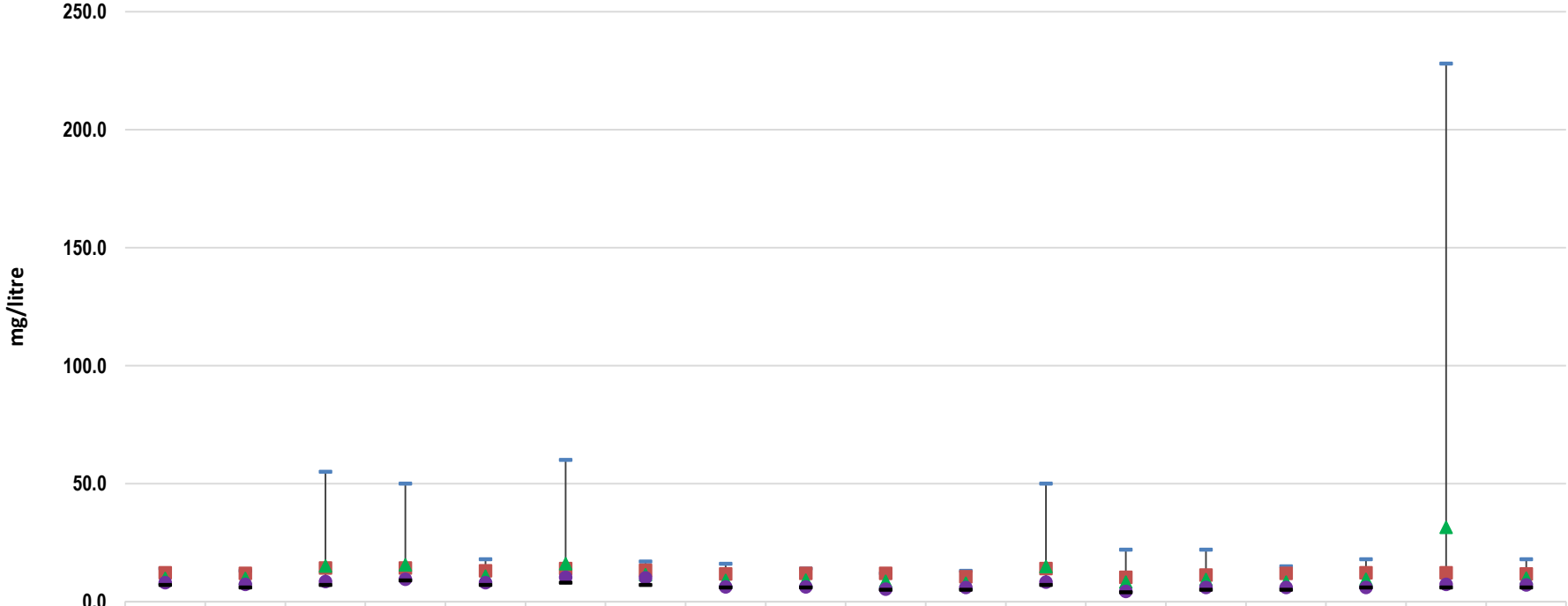
	2802	2801	2799	2807	2800	2798	2805	2797	1316	2795	2796	2806	2791	2794	2792	2793	2184	190
	Sea/Creek																	
	Coastal																	
Max	5.2	5.4	4.9	4.8	5.5	5.0	4.9	5.7	5.6	6.2	5.9	4.9	7.0	5.8	5.6	5.6	5.2	5.2
75 Perc	4.9	4.8	4.7	4.6	4.8	4.5	4.7	5.3	5.2	5.5	5.4	4.8	6.1	5.2	5.4	5.4	5.2	5.0
Avg	4.7	4.6	4.4	4.4	4.3	4.3	4.4	5.0	4.9	5.1	5.2	4.5	5.0	5.0	5.0	4.8	4.6	4.5
25 Perc	4.5	4.3	4.0	4.2	3.8	4.1	4.3	4.5	4.5	4.5	4.8	4.2	4.7	4.9	4.6	4.2	4.3	4.2
Min	3.9	3.9	3.1	3.4	2.6	3.2	3.2	3.6	3.7	3.6	3.9	3.6	1.1	3.5	3.5	3.3	3.6	3.4

Figure No. 52: Trend of Dissolved Oxygen (DO) levels recorded at WQMS monitoring sea and creek water (1 of 2)



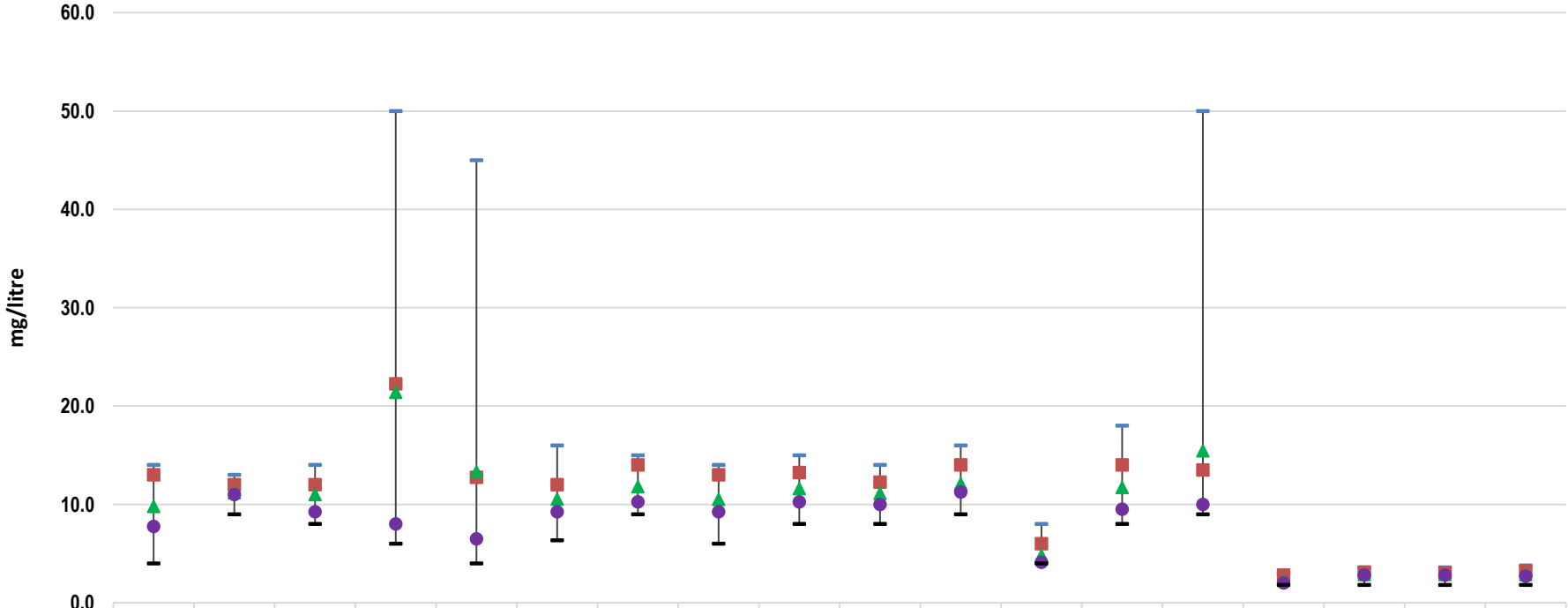
	2185	2169	2812	1318	2811	2167	2810	2809	2166	2808	2165	2803	1317	191	2804	2813	2814	2815
	Sea/Creek																	
	Coastal																	
Max	6.8	4.6	4.9	5.5	6.4	4.8	4.9	5.4	4.9	5.1	5.0	7.0	5.2	4.6	7.0	7.0	6.8	6.9
75 Perc	4.9	4.6	4.5	4.5	4.9	4.6	4.5	4.8	4.9	4.6	4.5	6.2	4.7	4.4	6.6	6.7	6.7	6.5
Avg	4.9	4.3	4.4	4.3	4.6	4.4	4.4	4.5	4.5	4.4	4.3	6.1	4.4	4.3	6.4	6.4	6.3	6.3
25 Perc	4.2	4.0	4.3	3.9	4.4	4.3	4.2	4.3	4.3	4.1	4.1	5.9	4.2	4.2	6.2	6.4	6.2	6.2
Min	3.4	3.9	3.9	3.3	2.8	3.2	3.5	3.5	3.3	3.5	3.2	5.4	3	3.8	5	5.2	5	5

Figure No. 53: Trend of Dissolved Oxygen (DO) levels recorded at WQMS monitoring sea and creek water (2 of 2)



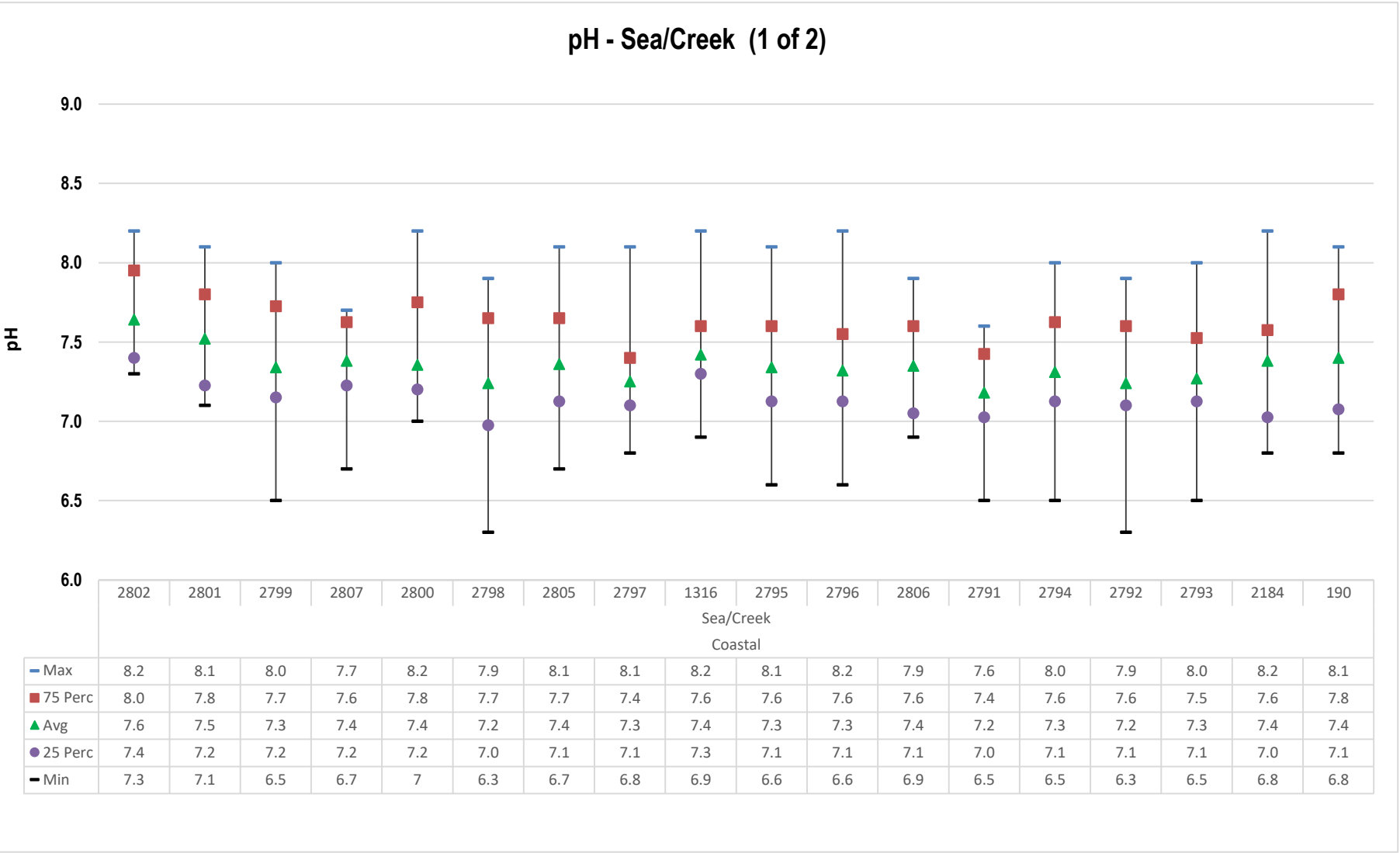
	2802	2801	2799	2807	2800	2798	2805	2797	1316	2795	2796	2806	2791	2794	2792	2793	2184	190
Max	14.0	13.0	55.0	50.0	18.0	60.0	17.0	16.0	14.0	12.0	13.0	50.0	22.0	22.0	15.0	18.0	228.0	18.0
75 Perc	12.3	12.0	14.3	14.3	13.0	14.0	13.3	11.8	12.0	12.0	10.5	14.0	10.3	11.3	12.0	12.3	12.3	11.8
Avg	9.8	9.8	15.1	15.6	10.8	16.0	11.4	9.0	9.1	8.6	7.8	14.8	8.2	9.3	8.2	9.5	31.5	9.9
25 Perc	8.0	7.3	8.5	9.5	8.0	10.3	10.0	6.3	6.3	5.3	6.0	8.3	4.3	6.0	6.0	6.0	7.3	7.0
Min	7	6	7	9	7	8	7	6	6	5	5	7	4	5	5	6	6	6

Figure No. 54: Trend of Biological Oxygen Demand (BOD) levels recorded at WQMS monitoring sea and creek water (1 of 2)



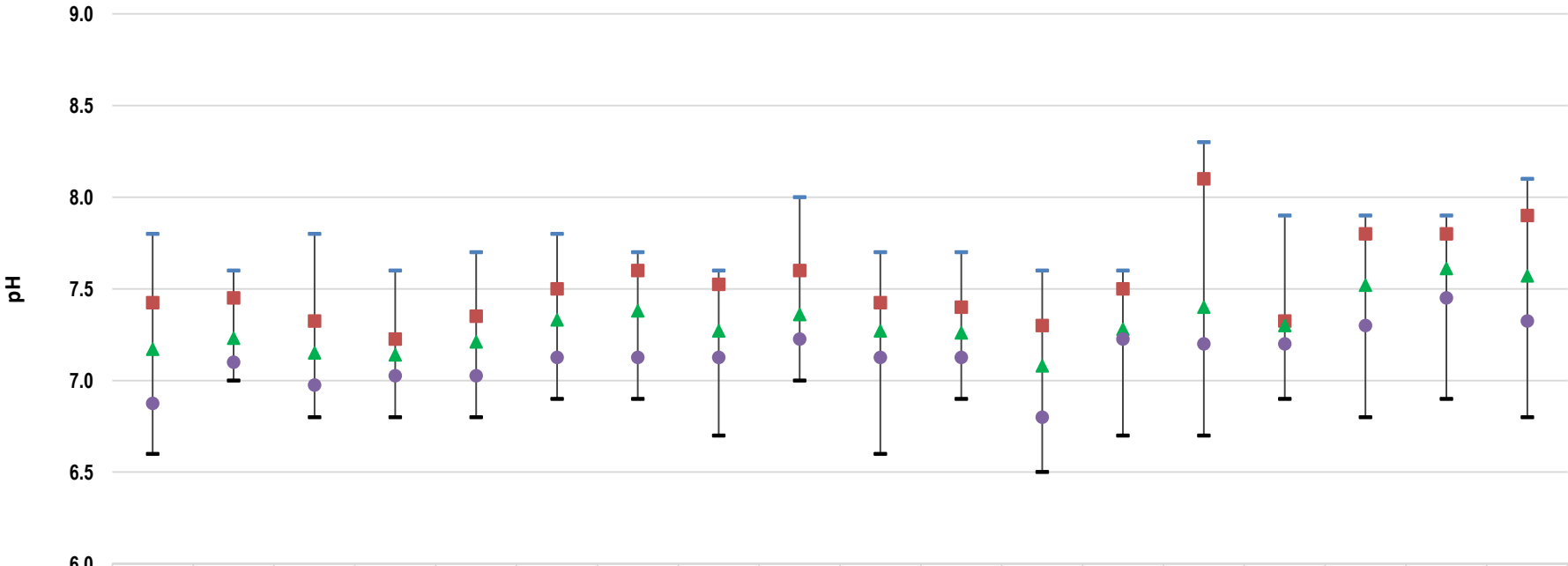
	2185	2169	2812	1318	2811	2167	2810	2809	2166	2808	2165	2803	1317	191	2804	2813	2814	2815
	Sea/Creek																	
	Coastal																	
Max	14.0	13.0	14.0	50.0	45.0	16.0	15.0	14.0	15.0	14.0	16.0	8.0	18.0	50.0	3.0	3.6	3.6	3.8
75 Perc	13.0	12.0	12.0	22.3	12.8	12.0	14.0	13.0	13.3	12.3	14.0	6.0	14.0	13.5	2.8	3.1	3.1	3.2
Avg	9.8	11.2	11.0	21.4	13.3	10.5	11.8	10.5	11.6	11.1	12.1	4.8	11.7	15.4	2.3	2.9	2.9	2.9
25 Perc	7.8	11.0	9.3	8.0	6.5	9.3	10.3	9.3	10.3	10.0	11.3	4.1	9.5	10.0	2.0	2.8	2.8	2.7
Min	4	9	8	6	4	6.34	9	6	8	8	9	4	8	9	1.8	1.8	1.8	1.8

Figure No. 55: Trend of Biological Oxygen Demand (BOD) levels recorded at WQMS monitoring sea and creek water (2 of 2)



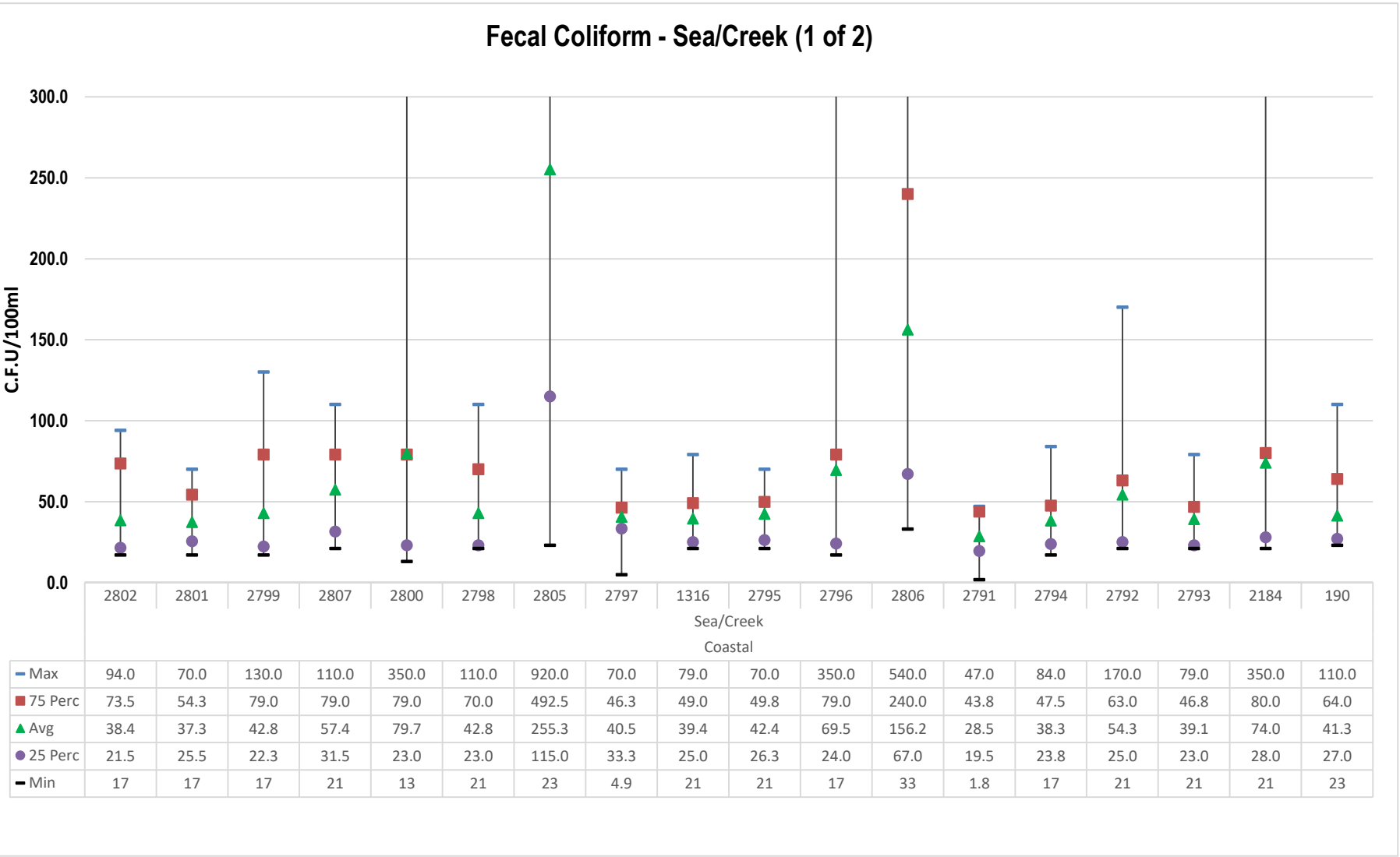
	2802	2801	2799	2807	2800	2798	2805	2797	1316	2795	2796	2806	2791	2794	2792	2793	2184	190
Max	8.2	8.1	8.0	7.7	8.2	7.9	8.1	8.1	8.2	8.1	8.2	7.9	7.6	8.0	7.9	8.0	8.2	8.1
75 Perc	8.0	7.8	7.7	7.6	7.8	7.7	7.7	7.4	7.6	7.6	7.6	7.6	7.4	7.6	7.6	7.5	7.6	7.8
Avg	7.6	7.5	7.3	7.4	7.4	7.2	7.4	7.3	7.4	7.3	7.3	7.4	7.2	7.3	7.2	7.3	7.4	7.4
25 Perc	7.4	7.2	7.2	7.2	7.2	7.0	7.1	7.1	7.3	7.1	7.1	7.1	7.0	7.1	7.1	7.1	7.0	7.1
Min	7.3	7.1	6.5	6.7	7	6.3	6.7	6.8	6.9	6.6	6.6	6.9	6.5	6.5	6.3	6.5	6.8	6.8

Figure No. 56: Trend of pH levels recorded at WQMS monitoring sea and creek water (1 of 2)



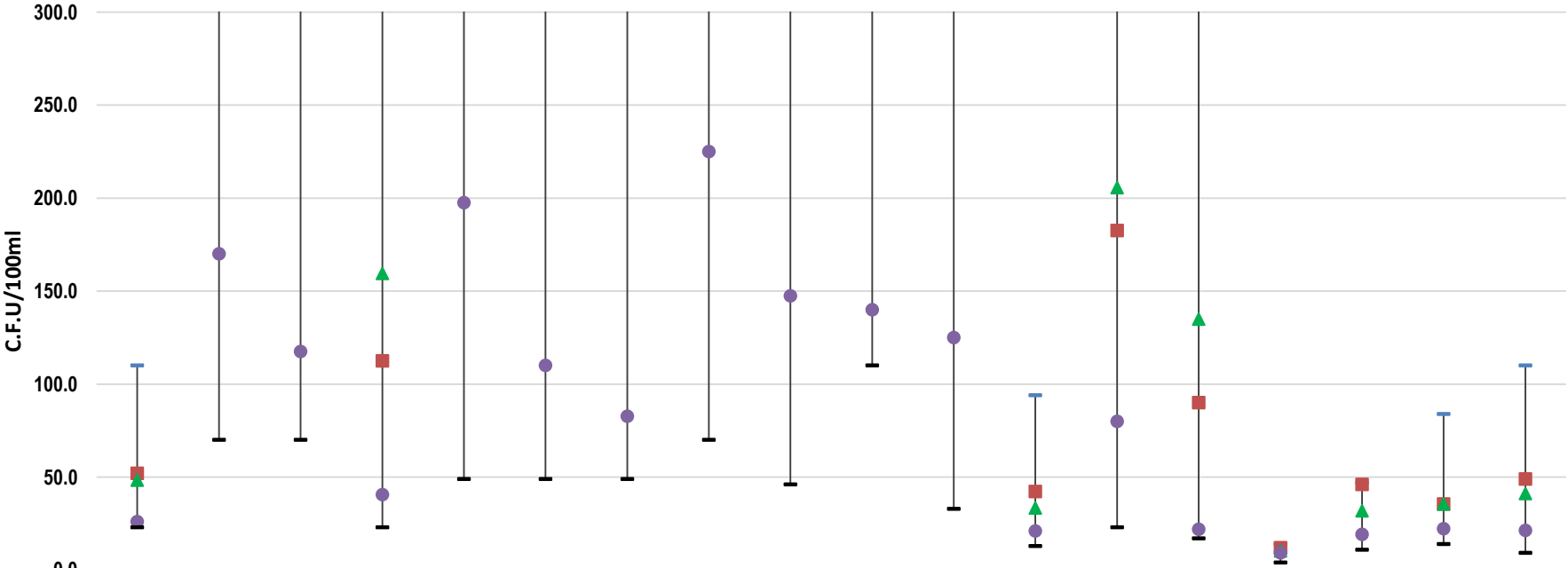
	2185	2169	2812	1318	2811	2167	2810	2809	2166	2808	2165	2803	1317	191	2804	2813	2814	2815
	Sea/Creek																	
	Coastal																	
Max	7.8	7.6	7.8	7.6	7.7	7.8	7.7	7.6	8.0	7.7	7.7	7.6	7.6	8.3	7.9	7.9	7.9	8.1
75 Perc	7.4	7.5	7.3	7.2	7.4	7.5	7.6	7.5	7.6	7.4	7.4	7.3	7.5	8.1	7.3	7.8	7.8	7.9
Avg	7.2	7.2	7.2	7.1	7.2	7.3	7.4	7.3	7.4	7.3	7.3	7.1	7.3	7.4	7.3	7.5	7.6	7.6
25 Perc	6.9	7.1	7.0	7.0	7.0	7.1	7.1	7.1	7.2	7.1	7.1	6.8	7.2	7.2	7.2	7.3	7.5	7.3
Min	6.6	7	6.8	6.8	6.8	6.9	6.9	6.7	7	6.6	6.9	6.5	6.7	6.7	6.9	6.8	6.9	6.8

Figure No. 57: Trend of pH levels recorded at WQMS monitoring sea and creek water (2 of 2)



	2802	2801	2799	2807	2800	2798	2805	2797	1316	2795	2796	2806	2791	2794	2792	2793	2184	190
Max	94.0	70.0	130.0	110.0	350.0	110.0	920.0	70.0	79.0	70.0	350.0	540.0	47.0	84.0	170.0	79.0	350.0	110.0
75 Perc	73.5	54.3	79.0	79.0	79.0	70.0	492.5	46.3	49.0	49.8	79.0	240.0	43.8	47.5	63.0	46.8	80.0	64.0
Avg	38.4	37.3	42.8	57.4	79.7	42.8	255.3	40.5	39.4	42.4	69.5	156.2	28.5	38.3	54.3	39.1	74.0	41.3
25 Perc	21.5	25.5	22.3	31.5	23.0	23.0	115.0	33.3	25.0	26.3	24.0	67.0	19.5	23.8	25.0	23.0	28.0	27.0
Min	17	17	17	21	13	21	23	4.9	21	21	17	33	1.8	17	21	21	21	23

Figure No. 58: Trend of Fecal coliform levels recorded at WQMS monitoring sea and creek water (1 of 2)



	2185	2169	2812	1318	2811	2167	2810	2809	2166	2808	2165	2803	1317	191	2804	2813	2814	2815
	Sea/Creek																	
	Coastal																	
Max	110.0	920.0	1600.0	920.0	1600.0	1600.0	1600.0	1600.0	920.0	1600.0	920.0	94.0	920.0	920.0	14.0	47.0	84.0	110.0
75 Perc	52.0	920.0	920.0	112.5	920.0	920.0	920.0	1090.0	635.0	540.0	920.0	42.3	182.5	90.0	12.0	46.0	35.5	49.0
Avg	48.3	332.6	420.4	159.5	508.3	371.8	569.1	431.0	342.6	373.0	377.2	33.4	205.6	135.0	10.4	31.9	35.5	41.2
25 Perc	26.0	170.0	117.5	40.5	197.5	110.0	82.8	225.0	147.5	140.0	125.0	21.0	80.0	22.0	9.3	19.3	22.3	21.3
Min	23	70	70	23	49	49	49	70	46	110	33	13	23	17	4	11	14	9.2

Figure No. 59: Trend of Fecal coliform levels recorded at WQMS monitoring sea and creek water (2 of 2)

Water quality Index for WQMS monitoring Sea and Creek water (1 of 2)

Apr	53	55	49	51	60	48	44	57	53	60	51	52	54	60	58	63	58	60
May	58	58	47	55	50	53	47	63	61	60	55	49	62	55	53	54	58	53
Jun	57	57	30	31	68	28	42	70	55	52	72	30	75	53	48	48	55	53
Jul	69	68	72	66	63	66	60	72	74	77	69	66	75	73	71	67	70	68
Aug	70	69	65	62	68	62	64	74	75	77	75	59	79	73	77	76	55	69
Sep	67	67	67	63	62	64	63	74	74	77	76	64	81	76	76	74	64	68
Oct	70	70	62	60	63	61	55	71	67	69	74	54	80	70	70	65	59	Dry
Nov	60	56	57	56	53	56	52	68	68	70	69	56	68	63	68	71	72	68
Dec	64	69	59	60	72	60	58	62	59	64	62	56	71	69	64	66	70	63
Jan	64	62	59	56	58	60	54	63	63	61	64	51	63	63	62	58	64	65
Feb	61	58	59	61	Dry	60	59	61	66	61	64	59	45	64	71	71	58	Dry
Mar	59	61	66	60	45	63	54	61	65	63	57	63	63	66	58	58	49	52
Station Code	2802	2801	2799	2807	2800	2798	2805	2797	1316	2795	2796	2806	2791	2794	2792	2793	2184	190
Sub Basin	Sea/Creek (1 of 2)																	
Basin	Coastal																	

Legend

Good to Excellent	Medium to good	Bad	Bad to Very Bad	Dry	NA

Table No. 27: Surface water quality monitoring stations monitoring Sea/Creek water (1 of 2)

Program	Station ID	River/Nalla	Station Name	Village	Taluka	District
NWMP	2802	Dahanu creek	Dahanu Creek at Dahanu Fort	Danugaon	Dahanu	Thane
NWMP	2801	Savta creek	Savta Creek	Savta	Dahanu	Thane
NWMP	2799	Dandi creek	Dandi Creek	Dandi	Palghar	Thane
NWMP	2807	Navapur sea	Navapur Sea	Navapur	Palghar	Thane
NWMP	2800	Sarwali creek	Sarwali Creek	Sarwali	Palghar	Thane
NWMP	2798	Kharekuran Murbe creek	Kharekuran Murbe Creek	Kharekuran	Palghar	Thane
NWMP	2805	Arnala sea	Arnala Sea	Arnala	Vasai	Thane
NWMP	2797	Bhayander creek	Bhayander Creek at D/s of Railway Bridge at Jasal Park Chowpatty	Navghar	Bhayander	Thane
NWMP	1316	Bassein creek	Bassein creek at Vasai Fort, Thane	Bassein	Vasai	Thane
NWMP	2795	Ulhas creek	Ulhas Creek at Gaimukh at Nagla Bunder on Ghod Bunder Road	Nagla	Thane	Thane
NWMP	2796	Ulhas creek	Ulhas Creek at Versova Bridge	Versova	Vasai	Thane
NWMP	2806	Uttan sea	Uttan Sea at Bhayander	Uttan	Bhayander	Thane
NWMP	2791	Ulhas creek	Ulhas Creek at Reti Bunder, D/s of Kalyan-Bhiwandi Bridge	Kalyan	Kalyan	Thane
NWMP	2794	Ulhas creek	Ulhas Creek at Kolshet Reti Bunder	Kolshet	Thane	Thane
NWMP	2792	Ulhas creek	Ulhas Creek at Mumbra Reti Bunder	Mumbra	Thane	Thane
NWMP	2793	Thane creek	Thane Creek at Kalwa Road Bridge	Kalwa	Thane	Thane
NWMP	2184	Vashi creek	Vashi Creek at Airoli Bridge	Airoli	Thane	Thane
SWMP	190	Creek water	TTC Creek At Ghansoli Jetty	Ghansoli	Thane	Thane

Water quality Index for WQMS monitoring Sea and Creek water (2 of 2)

Apr	60	49	49	56	51	50	46	46	45	49	45	65	57	51	88	73	81	69
May	53	51	46	58	50	44	47	46	47	49	46	74	50	49	90	82	81	79
Jun	59	47	54	34	26	47	50	46	42	47	42	72	50	56	81	75	74	72
Jul	76	59	55	55	67	58	57	64	62	55	57	78	62	63	89	84	85	84
Aug	68	57	57	61	72	58	59	64	61	64	62	84	61	60	84	84	81	86
Sep	75	60	55	70	68	64	63	60	64	60	64	77	64	65	90	80	80	80
Oct	66	56	57	59	56	56	60	56	59	57	57	80	54	36	88	80	79	75
Nov	59	49	52	53	51	58	51	53	53	52	50	81	51	62	88	79	79	78
Dec	59	57	63	72	63	55	54	56	56	54	57	67	57	50	87	79	77	77
Jan	61	54	57	51	50	57	55	51	55	55	53	73	53	61	84	81	82	81
Feb	59	57	60	32	55	55	49	56	52	56	51	81	61	57	84	84	82	79
Mar	65	53	53	38	42	60	50	58	57	53	56	82	65	Dry	87	77	80	77
Station Code	2185	2169	2812	1318	2811	2167	2810	2809	2166	2808	2165	2803	1317	191	2804	2813	2814	2815
Sub Basin	Sea/Creek (2 of 2)																	
Basin	Coastal																	

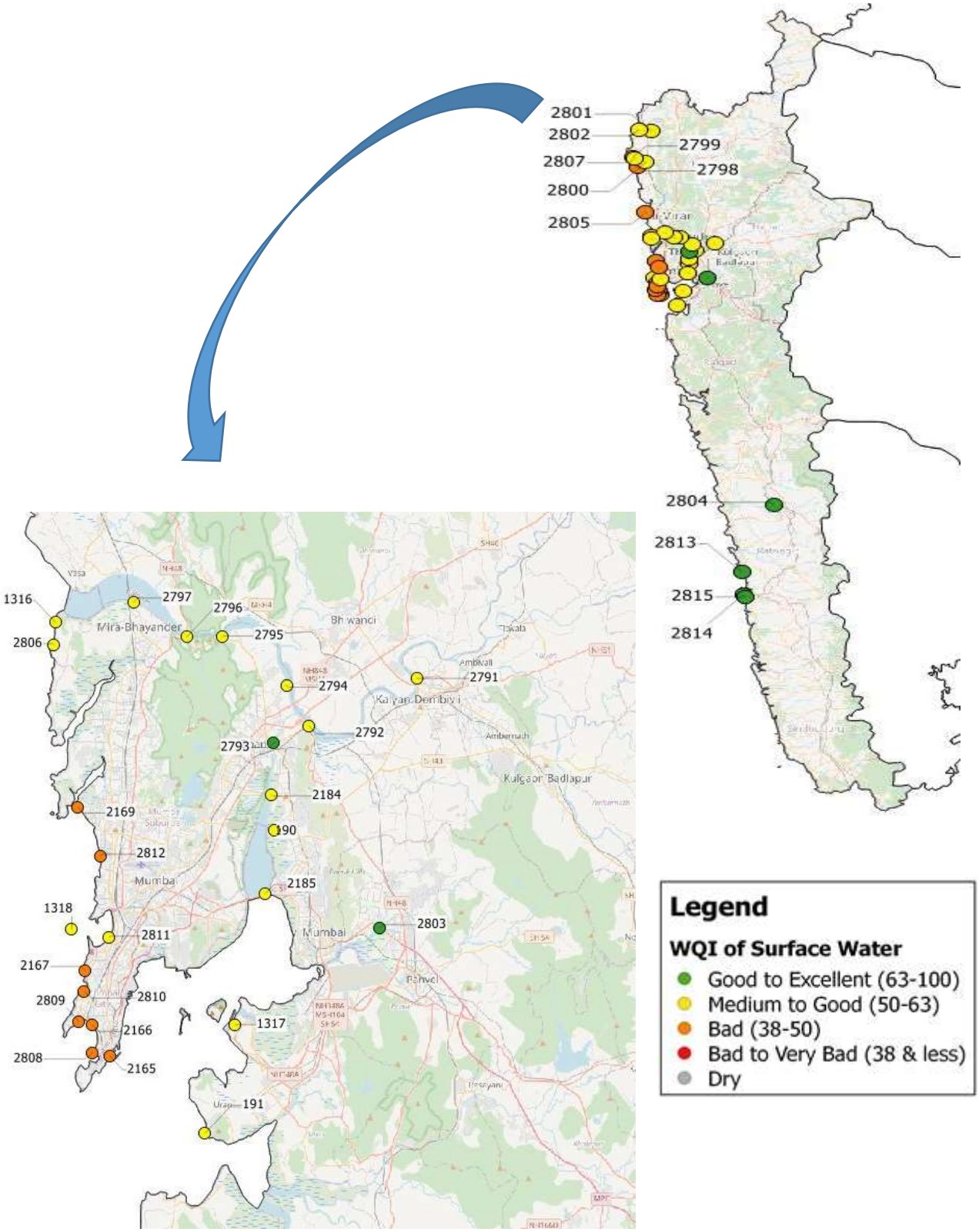
Legend

Good to Excellent	Medium to good	Bad	Bad to Very Bad	Dry	No data

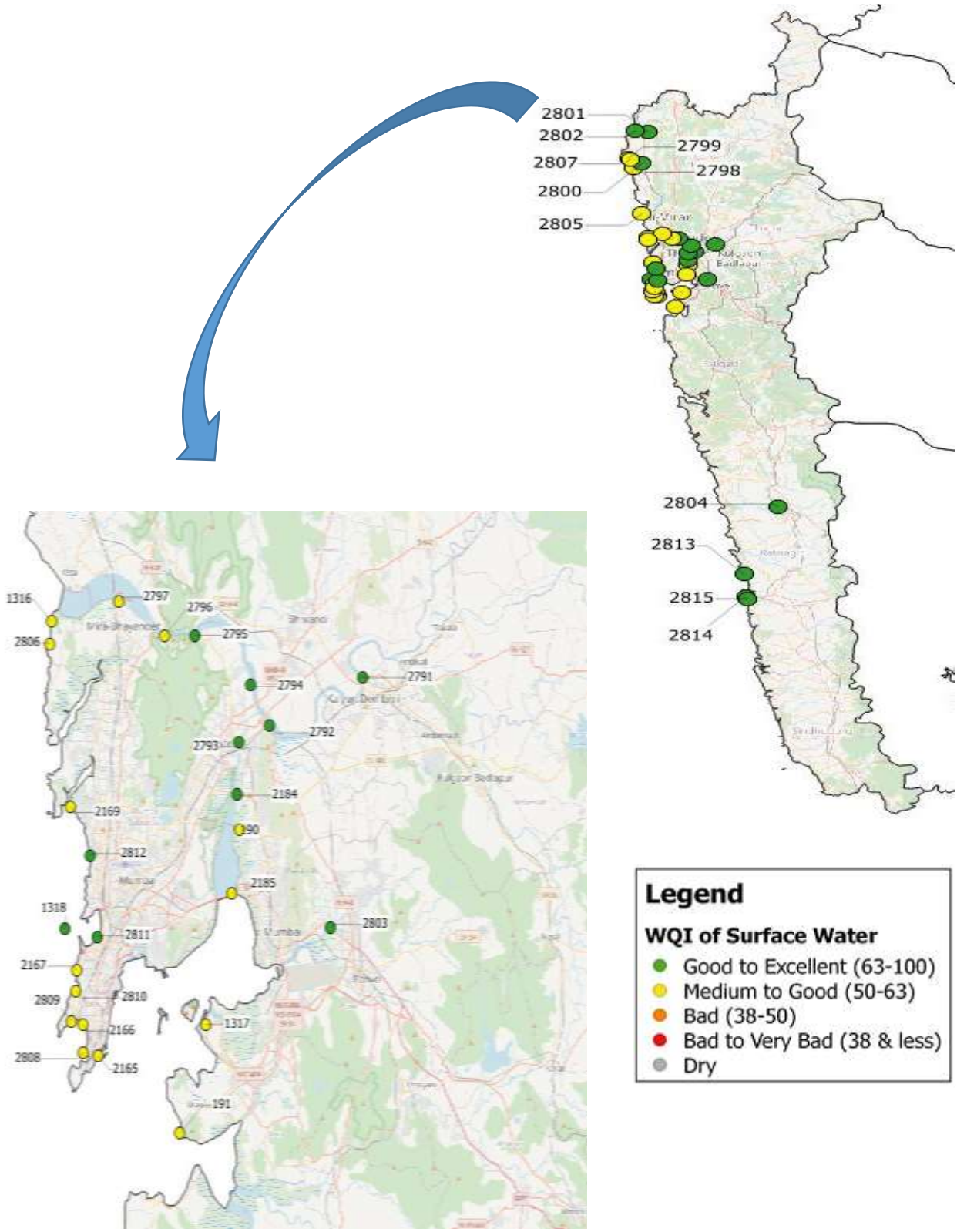
Table No. 28: Surface water quality monitoring stations monitoring Sea/Creek water (2 of 2)

Program	Station ID	River/Nalla	Station Name	Village	Taluka	District
NWMP	2185	Vashi creek	Vashi Creek at Vashi Bridge	Vashi	Thane	Thane
NWMP	2169	Sea	Sea Water at Varsova Beach	Versova	Andheri	Mumbai
NWMP	2812	Sea	Sea Water at Juhu Beach	Juhugaon	Santacruz	Mumbai
NWMP	1318	Mahim creek	Mahim creek at Mahim Bay	Mahim	Bandra	Mumbai
NWMP	2811	Sea	Sea Water at Shivaji Park (Dadar Chowpatty)	Dadar	Dadar	Mumbai
NWMP	2167	Sea	Sea Water at Worli Seaface	Worli	Worli	Mumbai
NWMP	2810	Sea	Sea Water at Haj Ali	Worli	Worli	Mumbai
NWMP	2809	Sea	Sea Water at Malabar Hill	Walkeshwar	Mumbai	Mumbai
NWMP	2166	Sea	Sea Water at Charni Road Chowpatty	Girgaon	Mumbai	Mumbai
NWMP	2808	Sea	Sea Water at Nariman Point	Colaba	Colaba	Mumbai
NWMP	2165	Sea	Sea Water at Gateway of India	Colaba	Colaba	Mumbai
NWMP	2803	Panvel creek	Panvel Creek at Kopra Bridge	Kopra	Panvel	Raigad
NWMP	1317	Thane creek	Thane creek at Elephanta Island	Gharapuri, Elephanta Island	Uran	Raigad
SWMP	191	Sea Water	Arabian Sea behind ONGC Uran	Uran	Uran	Raigad
NWMP	2804	Karambavane creek	Karambavane Creek at Chiplun	Karambavane	Chiplun	Ratnagiri
NWMP	2813	Sea	Sea Water at Ganapatipule	Ganapatipule	Ratnagiri	Ratnagiri
NWMP	2814	Sea	Sea Water at Bhagwati Bunder, Ratnagiri near Ultra Tech Cement Jetty	Mirkarwada	Ratnagiri	Ratnagiri
NWMP	2815	Madvi sea	Madvi Sea Water at Ratnagiri near Jodhale Maruti Temple	Madvigaon	Ratnagiri	Ratnagiri

Spatial map of WQI for Sea and Creek Water (April 2019)



Spatial map of WQI for Sea and Creek Water (December 2019)



Ground Water Quality

Groundwater is an important part of natural water cycle. Some portion of precipitated water after reaching on ground gets infiltrated into the subsurface. This portion continues to move downwards through the soil until it reaches rock formation/material that is saturated which is termed as groundwater recharge. About 30% of world's total freshwater gets represented by groundwater[29]. It is a very important natural resource which plays a significant role in the economy. The extent of use of groundwater varies worldwide based on various factors; primarily geography and climatic conditions. In India, as of 2015, the amount of usable water resources of the country stands at about 1123 Billion Cubic Meter (BCM)/year. Out of this, the share of groundwater is about 433 BCM/year. About 89% of ground water extracted in India gets utilized in irrigation sector followed by domestic sctor (9%) and Industrial sector (2%)[30]. This makes ground water a major alternative to surface water for various operations.

Over 1/3rd of total geographical area of Maharashtra state, situated at western peninsular region of India; falls under the rain shadow area which receives scanty rainfall. In addition to this, a large geographical area of the state is occupied by hard rock which is a combination of basalt and metamorphic rock types. These adverse hydrogeological conditions put limitations on the availability and development of groundwater[31]. To monitor the groundwater levels and quality, Central Ground Water Board (CGWB), Ground water Survey and Development Agency (GSDA) and MPCB monitors the ground water quality across various districts of the state. For this purpose, MPCB has installed 66 ground water monitoring stations which monitor water quality twice a year for parameters like pH, Nitrate, TDS, Hardness, Fluoride, microbial content, sulphates and so on.

The total WQMS for year 2019-20 are represented in the Table No. 29.

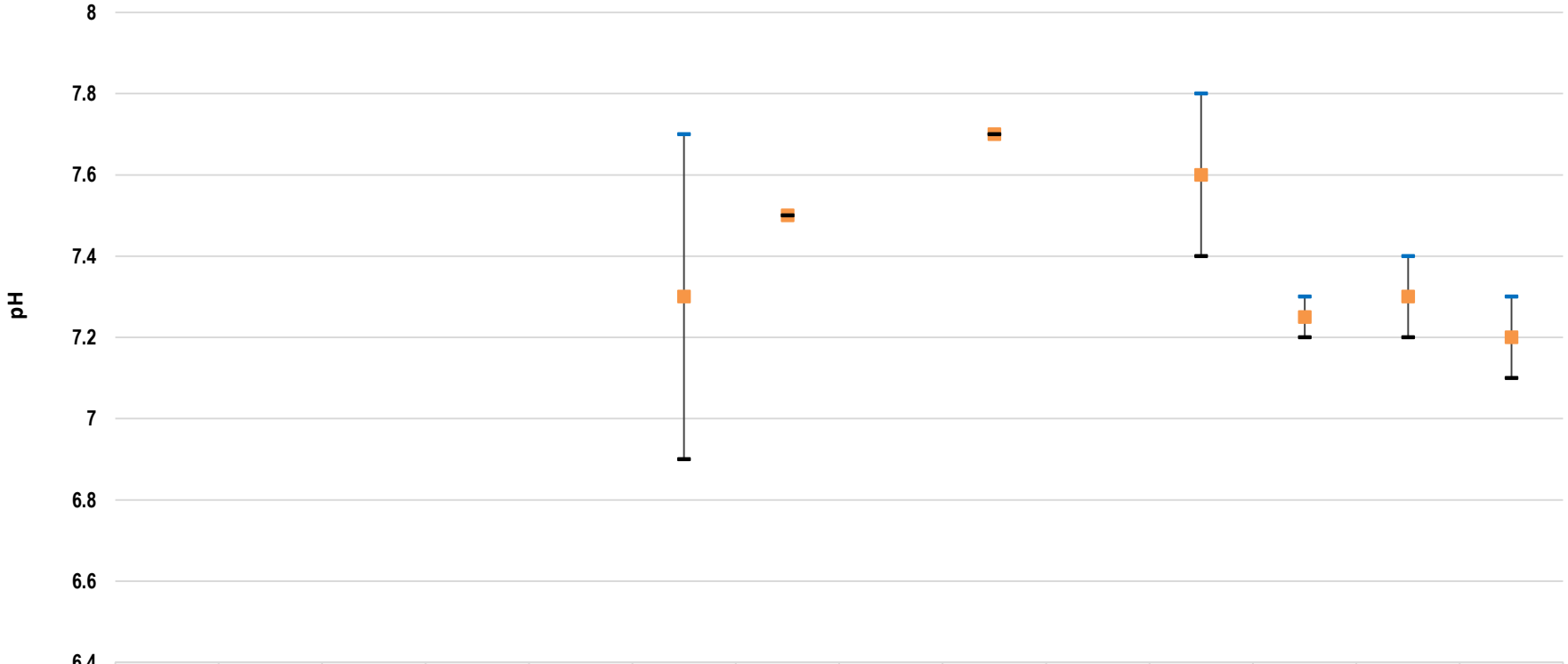
Table No. 29: List of Groundwater Quality Monitoring stations

Water Quality monitoring stations	
Water Bodies	**2019-20**
Bore well	29
Dug well	35
Tube well	1
Hand pump	1
Total	**66**

[29] https://www.un-igrac.org/what-groundwater

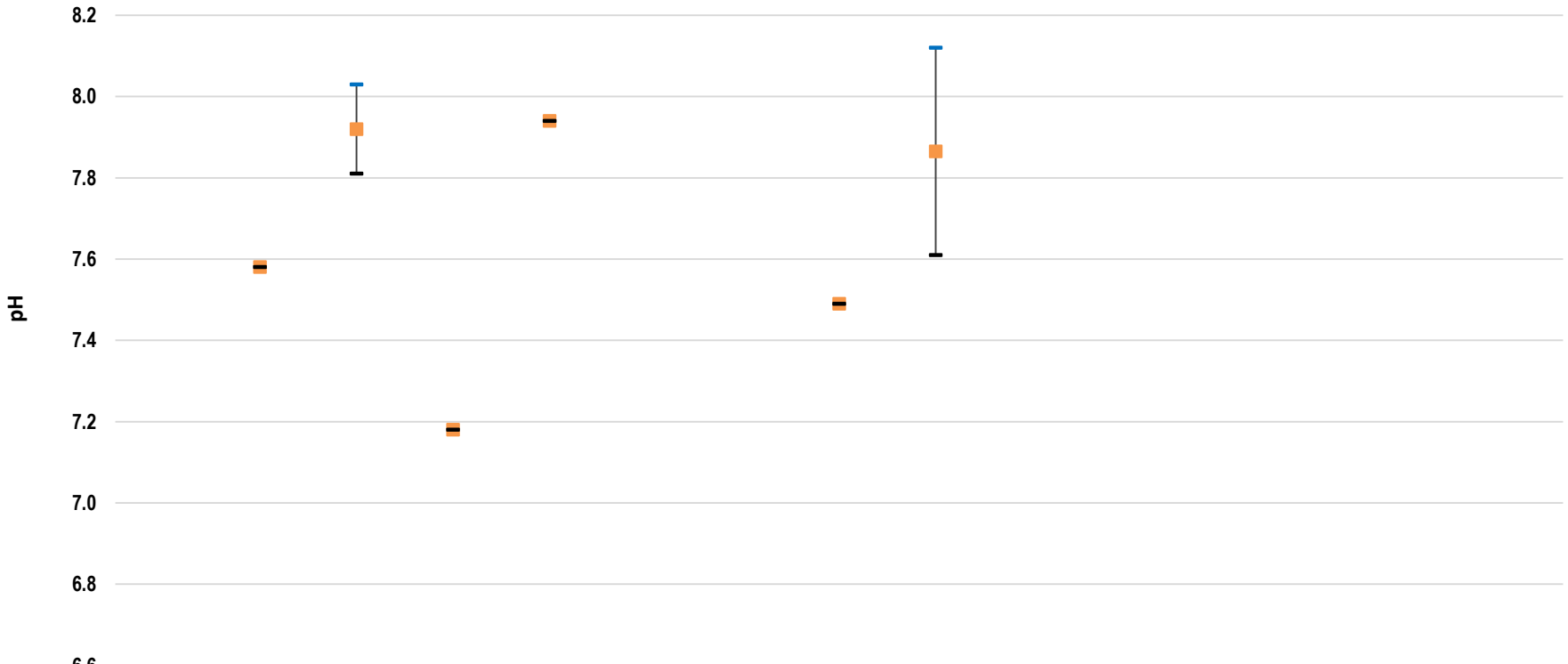
[30]https://www.prsindia.org/administrator/uploads/general/1455682937~~Overview%20of%20Ground%20Water%20in%20India.pdf

[31] https://gsda.maharashtra.gov.in/english/index.php/About_us



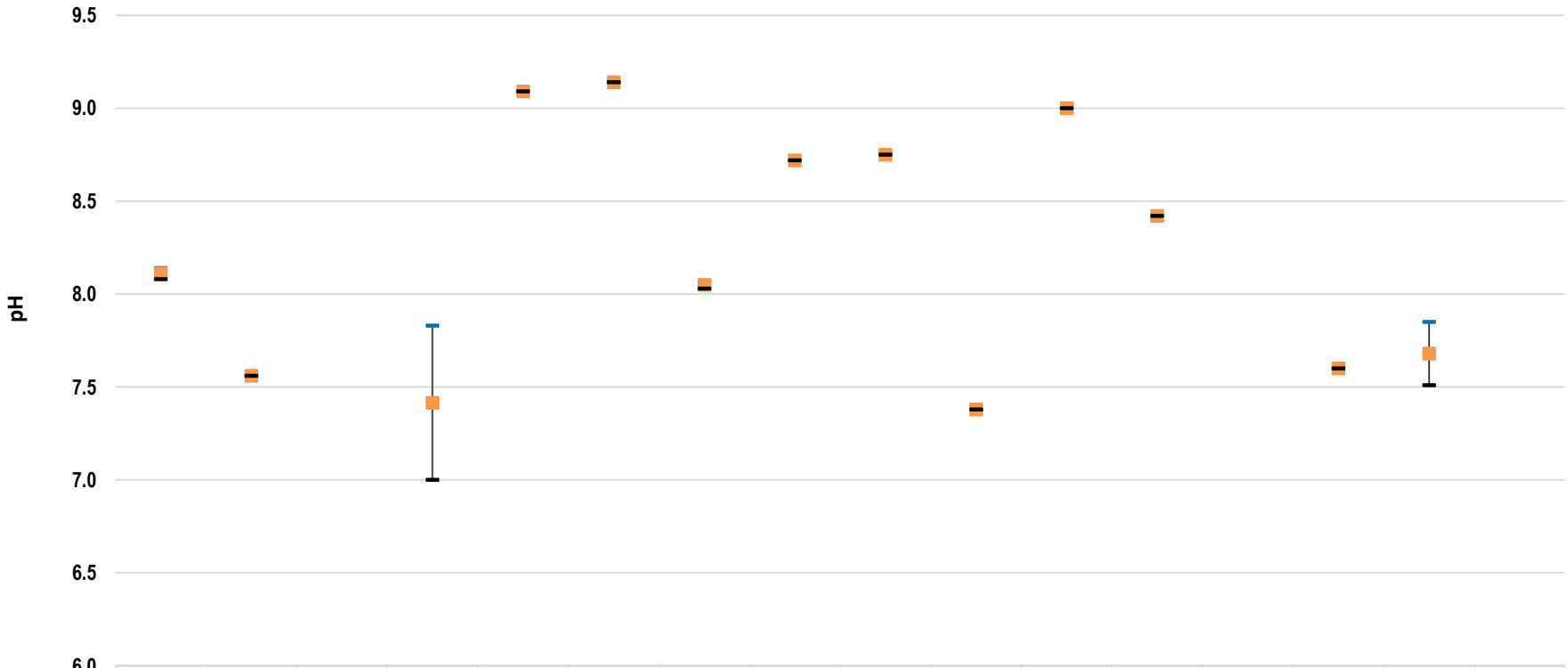
	205	206	207	208	214	215	217	218	1989	1984	1985	1986	1987	1988
	Kalyan				Navi Mumbai		Raigad			Thane				
Max						7.7	7.5		7.7		7.8	7.3	7.4	7.3
Avg						7.3	7.5		7.7		7.6	7.3	7.3	7.2
Min						6.9	7.5		7.7		7.4	7.2	7.2	7.1

Figure No. 60: Parametric values of pH recorded at WQMS monitoring ground water at Kalyan, Navi Mumbai, Raigad and Thane.



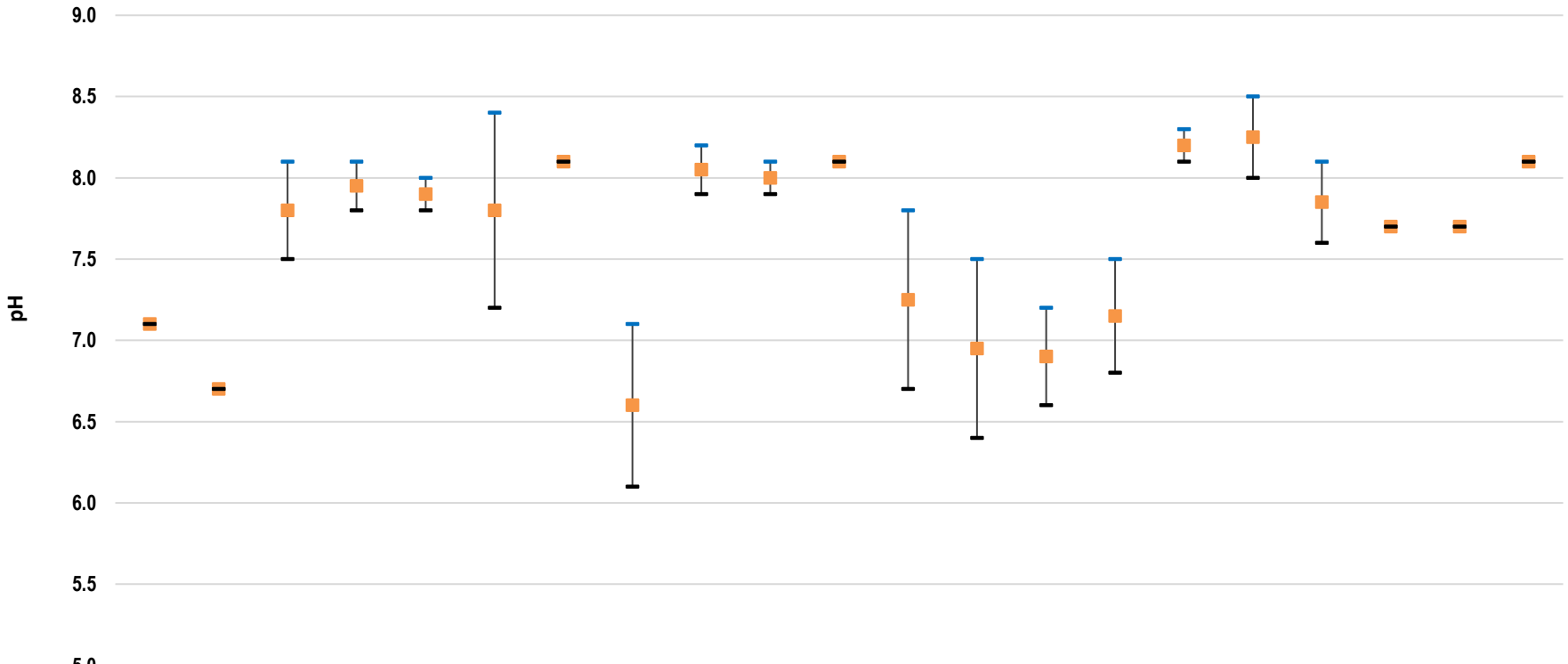
	2001	2002	2003	1993	2200	2201	2824	2825	221	1990	1991	2204	2816	2817	2818
		Amravati				Aurangabad						Nashik			
Max		7.6	8.0	7.2	7.9			7.5	8.1						
Avg		7.6	7.9	7.2	7.9			7.5	7.9						
Min		7.58	7.81	7.18	7.94			7.49	7.61						

Figure No. 61: Parametric values of pH recorded at WQMS monitoring ground water at Amravati, Aurangabad and Nashik.



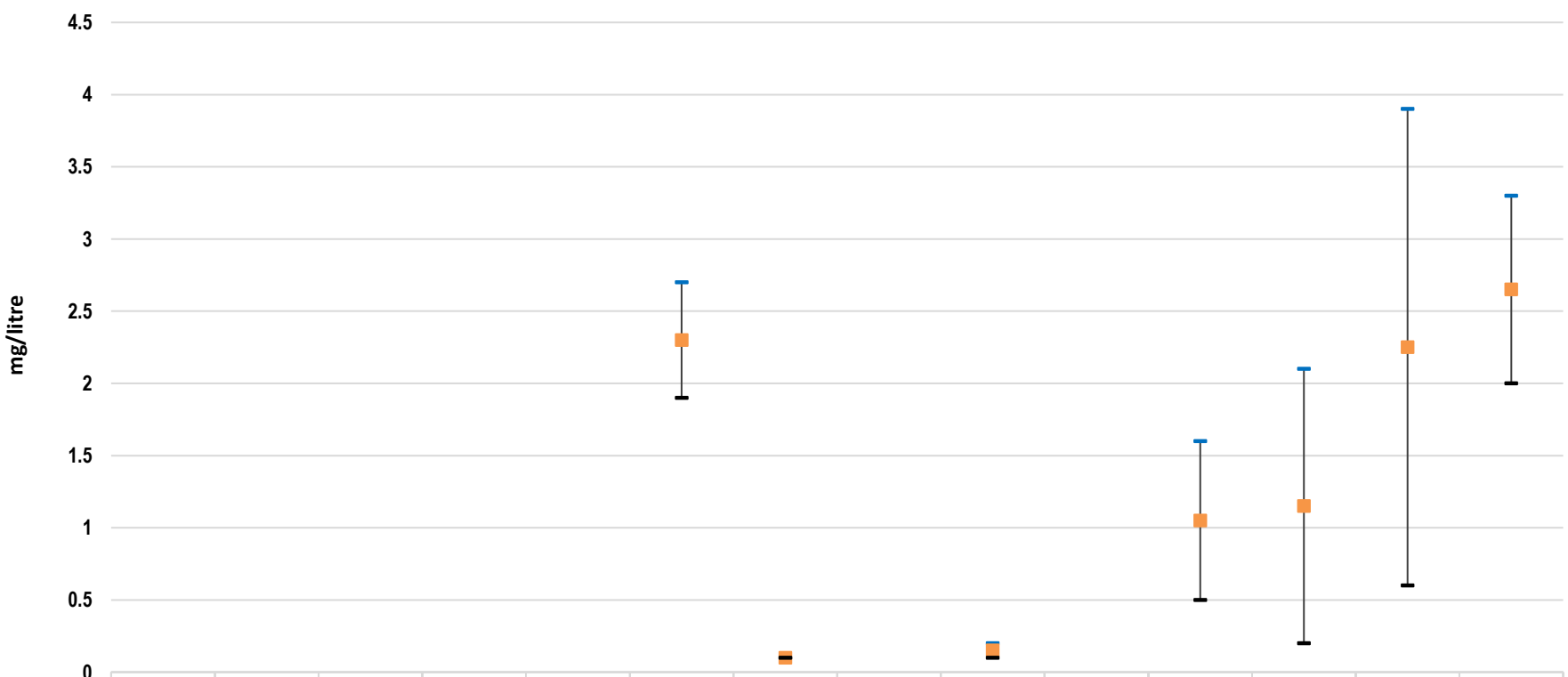
	2828	209	210	211	212	213	1994	1995	1996	1997	1998	1999	2000	2203	2826	2827
	Chandrapur								Nagpur							
Max	8.1	7.6		7.8	9.1	9.1	8.1	8.7	8.8	7.4	9.0	8.4		7.6	7.9	
Avg	8.1	7.6		7.4	9.1	9.1	8.1	8.7	8.8	7.4	9.0	8.4		7.6	7.7	
Min	8.08	7.56		7	9.09	9.14	8.03	8.72	8.75	7.38	9	8.42		7.6	7.51	

Figure No. 62: Parametric values of pH recorded at WQMS monitoring ground water at Chandrapur and Nagpur.



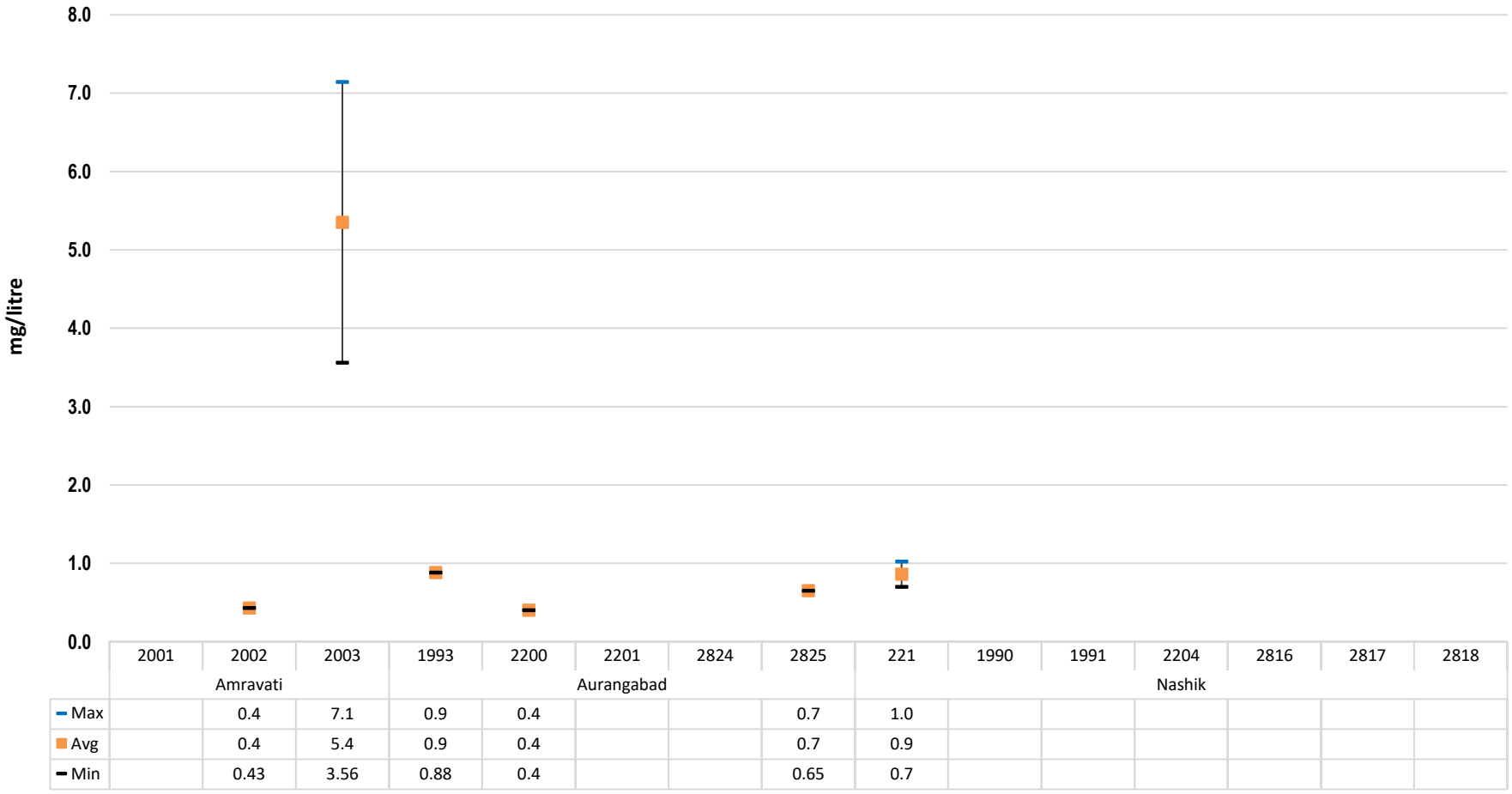
	219	220	2004	2005	2006	2007	2008	2202	2829	2830	2831	2832	2833	2834	2835	1992	2819	2820	2821	2822	2823
	Kolhapur															Pune					
Max	7.1	6.7	8.1	8.1	8.0	8.4	8.1	7.1	8.2	8.1	8.1	7.8	7.5	7.2	7.5	8.3	8.5	8.1	7.7	7.7	8.1
Avg	7.1	6.7	7.8	8.0	7.9	7.8	8.1	6.6	8.1	8.0	8.1	7.3	7.0	6.9	7.2	8.2	8.3	7.9	7.7	7.7	8.1
Min	7.1	6.7	7.5	7.8	7.8	7.2	8.1	6.1	7.9	7.9	8.1	6.7	6.4	6.6	6.8	8.1	8	7.6	7.7	7.7	8.1

Figure No. 63: Parametric values of pH recorded at WQMS monitoring ground water at Kolhapur and Pune.



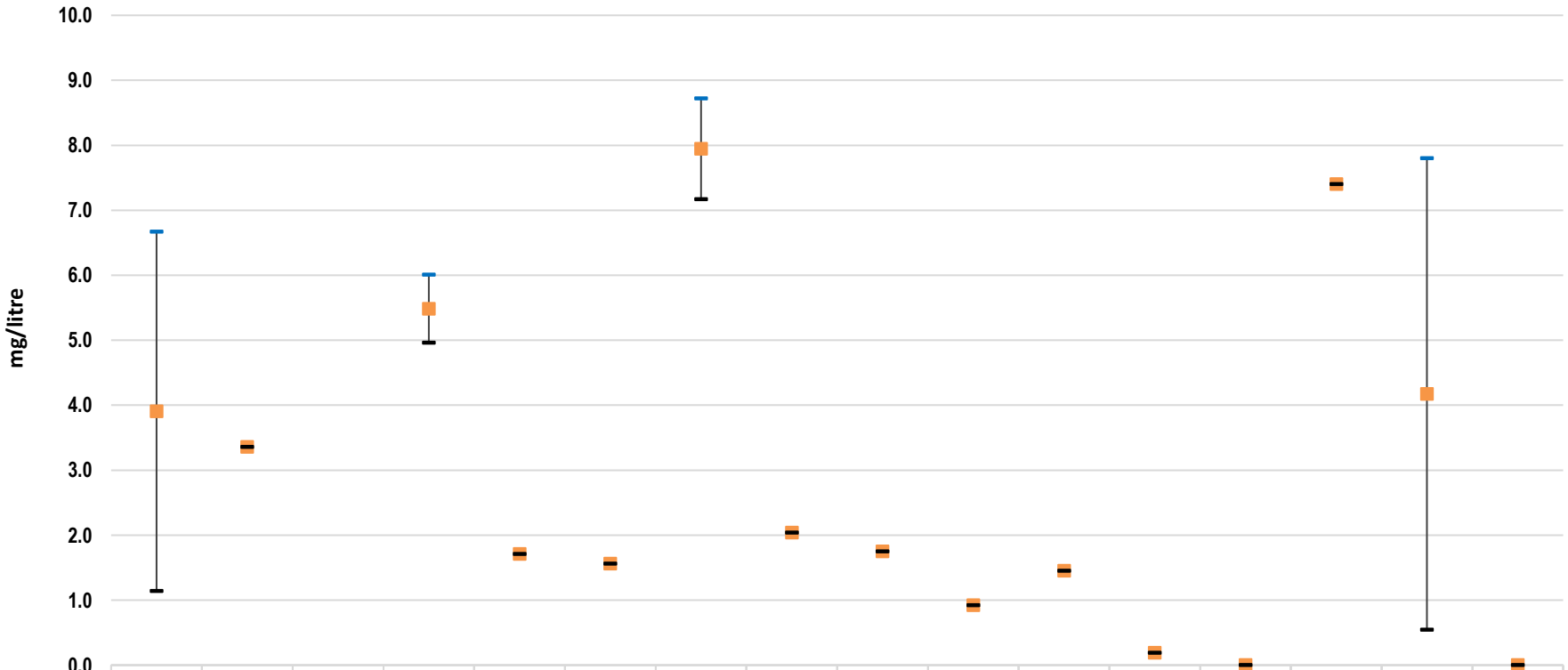
	205	206	207	208	214	215	217	218	1989	1984	1985	1986	1987	1988
	Kalyan				Navi Mumbai		Raigad			Thane				
Max						2.7	0.1		0.2		1.6	2.1	3.9	3.3
Avg						2.3	0.1		0.2		1.1	1.2	2.3	2.7
Min						1.9	0.1		0.1		0.5	0.2	0.6	2

Figure No. 64: Parametric values of Nitrate recorded at WQMS monitoring ground water at Kalyan, Navi Mumbai, Raigad and Thane.



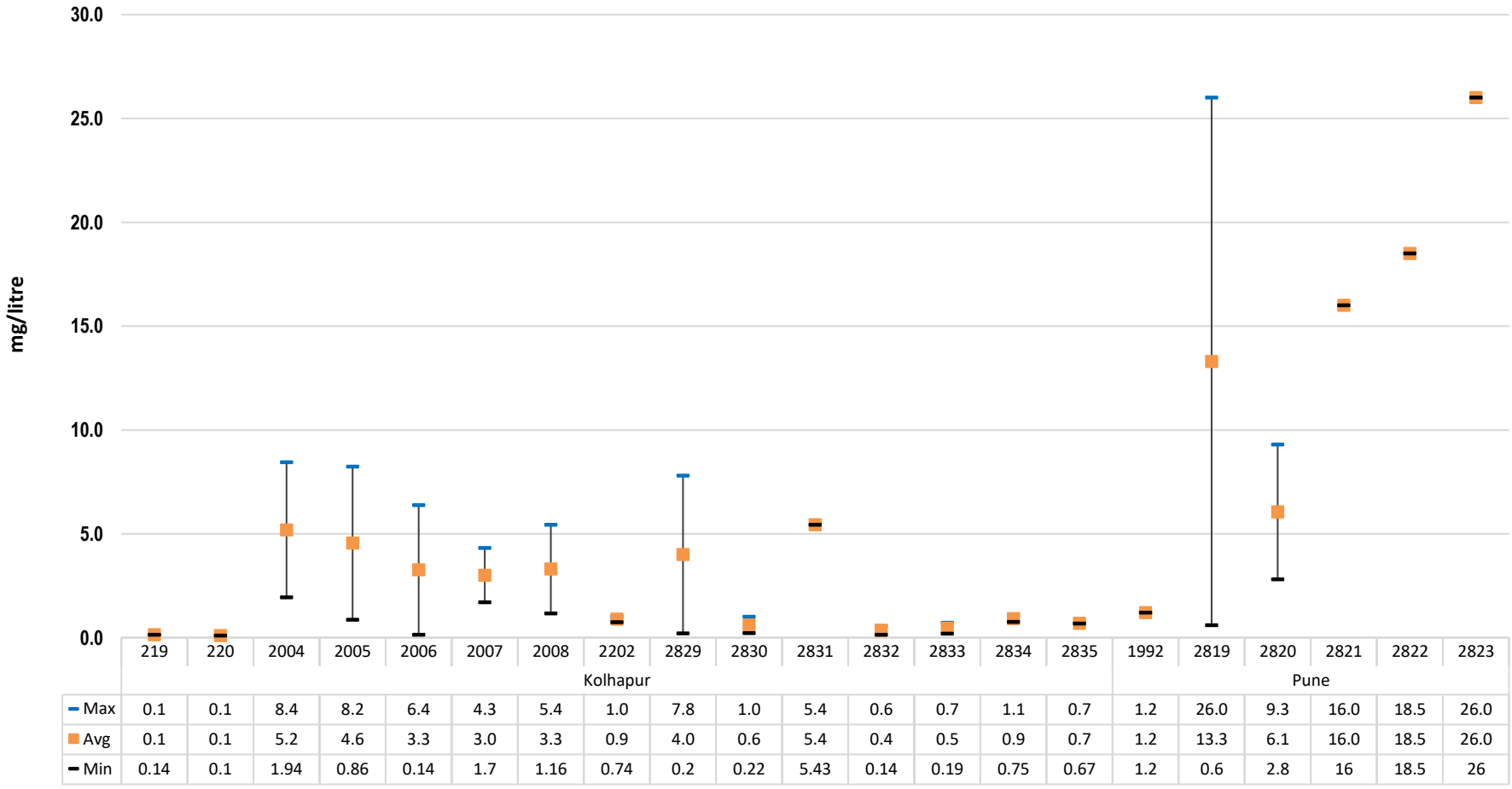
	2001	2002	2003	1993	2200	2201	2824	2825	221	1990	1991	2204	2816	2817	2818
		Amravati			Aurangabad							Nashik			
Max		0.4	7.1	0.9	0.4			0.7	1.0						
Avg		0.4	5.4	0.9	0.4			0.7	0.9						
Min		0.43	3.56	0.88	0.4			0.65	0.7						

Figure No. 65: Parametric values of Nitrate recorded at WQMS monitoring ground water at Amravati, Aurangabad and Nashik.



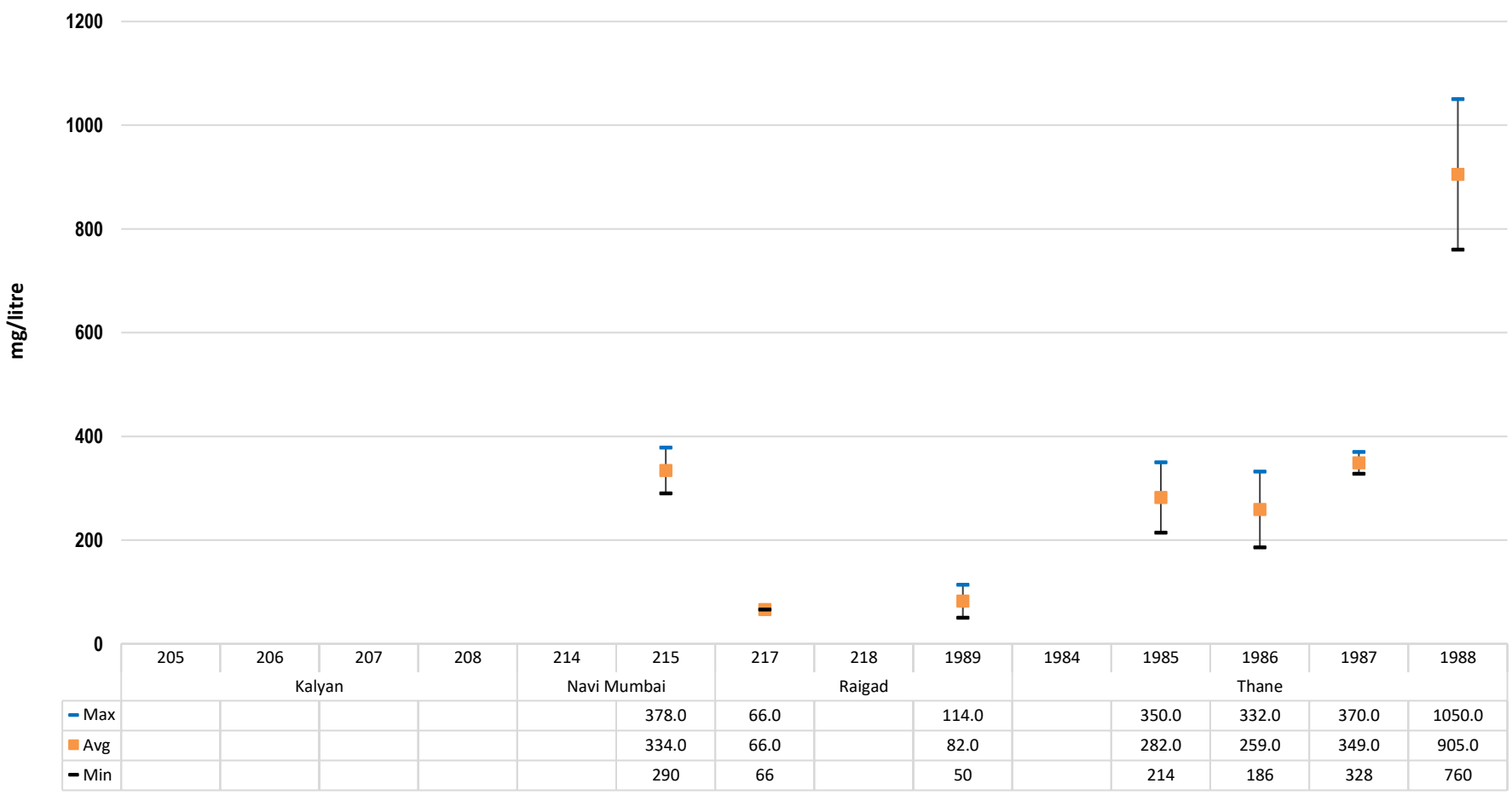
	2828	209	210	211	212	213	1994	1995	1996	1997	1998	1999	2000	2203	2826	2827
	Chandrapur								Nagpur							
Max	6.7	3.4		6.0	1.7	1.6	8.7	2.0	1.8	0.9	1.5	0.2	0.0	7.4	7.8	0.0
Avg	3.9	3.4		5.5	1.7	1.6	7.9	2.0	1.8	0.9	1.5	0.2	0.0	7.4	4.2	0.0
Min	1.14	3.36		4.96	1.71	1.56	7.17	2.04	1.75	0.92	1.45	0.19	0	7.4	0.544	0

Figure No. 66: Parametric values of Nitrate recorded at WQMS monitoring ground water at Chandrapur and Nagpur.



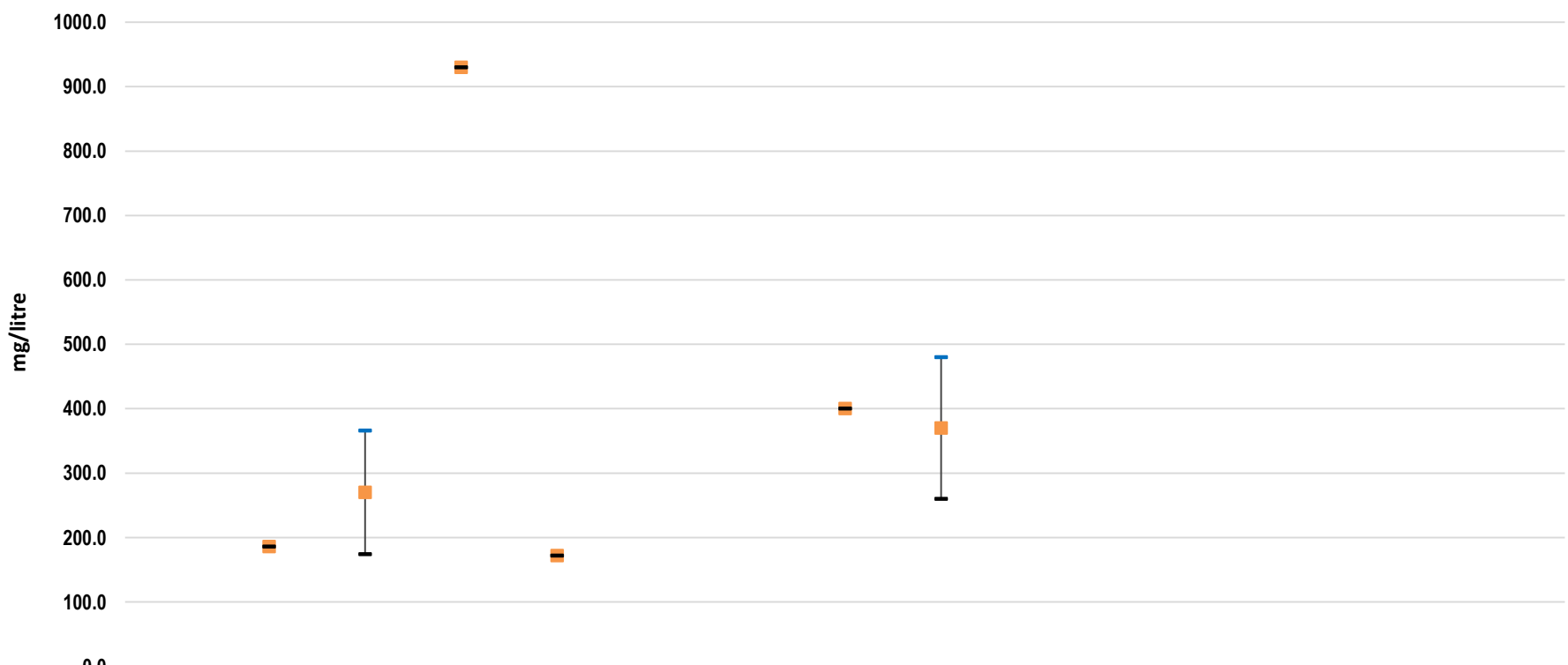
	219	220	2004	2005	2006	2007	2008	2202	2829	2830	2831	2832	2833	2834	2835	1992	2819	2820	2821	2822	2823
	Kolhapur															Pune					
Max	0.1	0.1	8.4	8.2	6.4	4.3	5.4	1.0	7.8	1.0	5.4	0.6	0.7	1.1	0.7	1.2	26.0	9.3	16.0	18.5	26.0
Avg	0.1	0.1	5.2	4.6	3.3	3.0	3.3	0.9	4.0	0.6	5.4	0.4	0.5	0.9	0.7	1.2	13.3	6.1	16.0	18.5	26.0
Min	0.14	0.1	1.94	0.86	0.14	1.7	1.16	0.74	0.2	0.22	5.43	0.14	0.19	0.75	0.67	1.2	0.6	2.8	16	18.5	26

Figure No. 67: Parametric values of Nitrate recorded at WQMS monitoring ground water at Kolhapur and Pune.



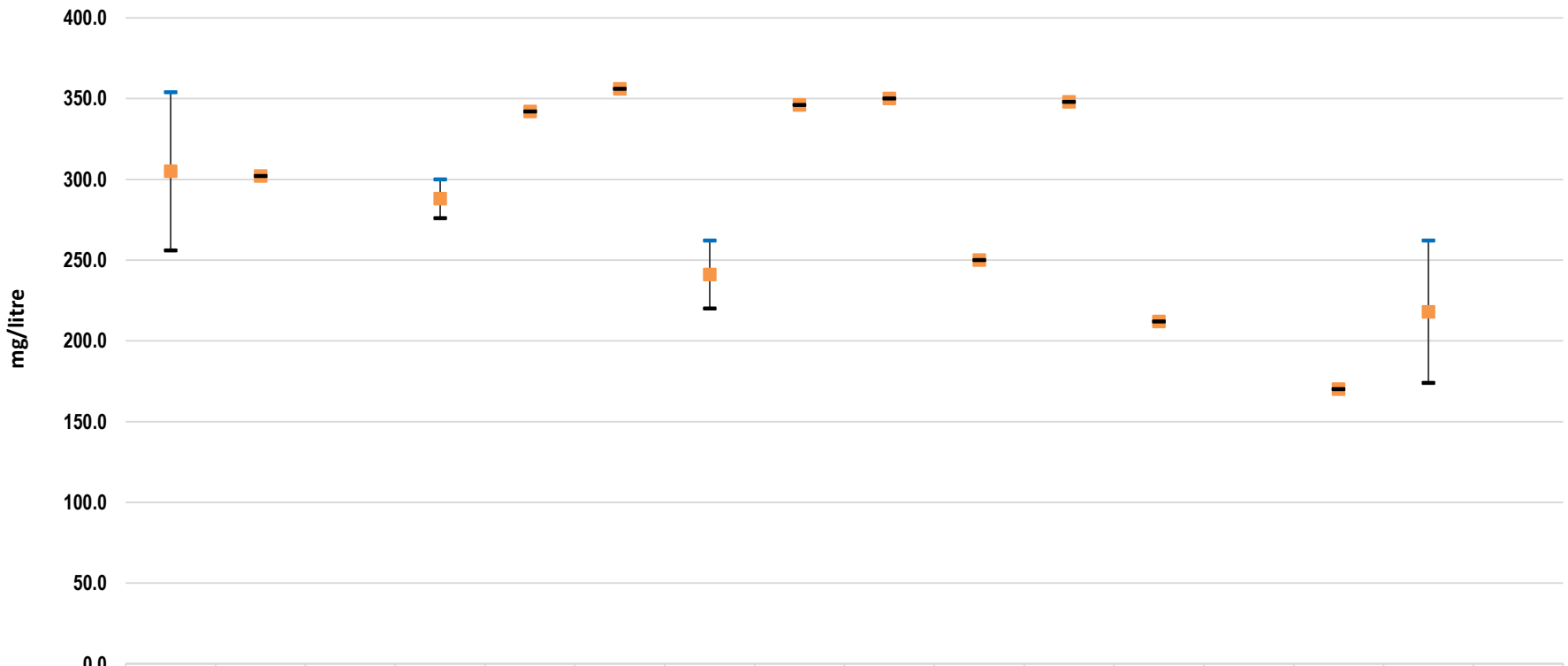
	205	206	207	208	214	215	217	218	1989	1984	1985	1986	1987	1988
	Kalyan				Navi Mumbai			Raigad			Thane			
Max						378.0	66.0		114.0		350.0	332.0	370.0	1050.0
Avg						334.0	66.0		82.0		282.0	259.0	349.0	905.0
Min						290	66		50		214	186	328	760

Figure No. 68: Parametric values of Hardness at $CaCO_3$ recorded at WQMS monitoring ground water at Kalyan, Navi Mumbai, Raigad and Thane.



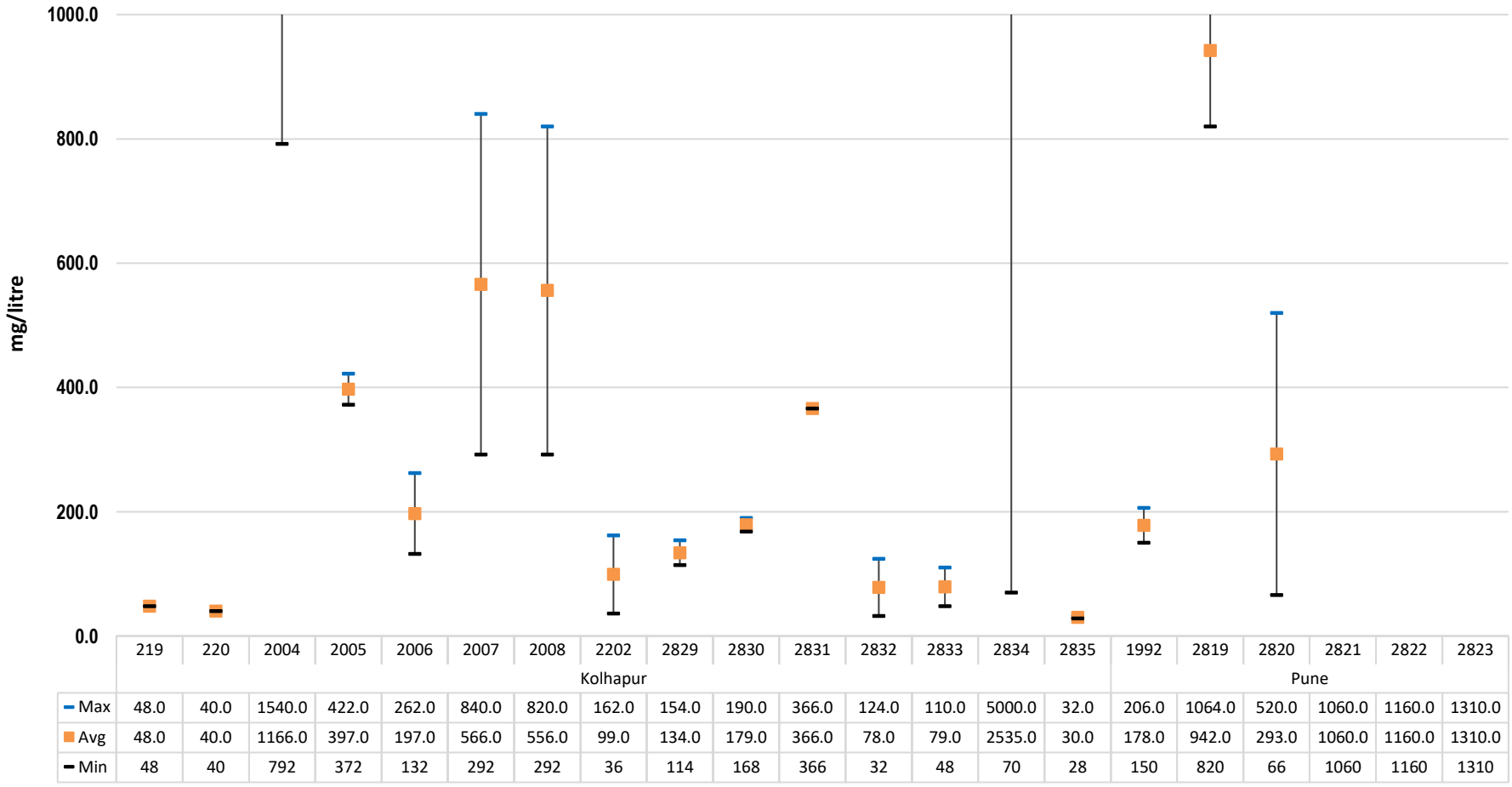
	2001	2002	2003	1993	2200	2201	2824	2825	221	1990	1991	2204	2816	2817	2818
		Amravati				Aurangabad						Nashik			
Max		186.0	366.0	930.0	172.0			400.0	480.0						
Avg		186.0	270.0	930.0	172.0			400.0	370.0						
Min		186	174	930	172			400	260						

Figure No. 69: Parametric values of Hardness at $CaCO_3$ recorded at WQMS monitoring ground water at Amravati, Aurangabad and Nashik.



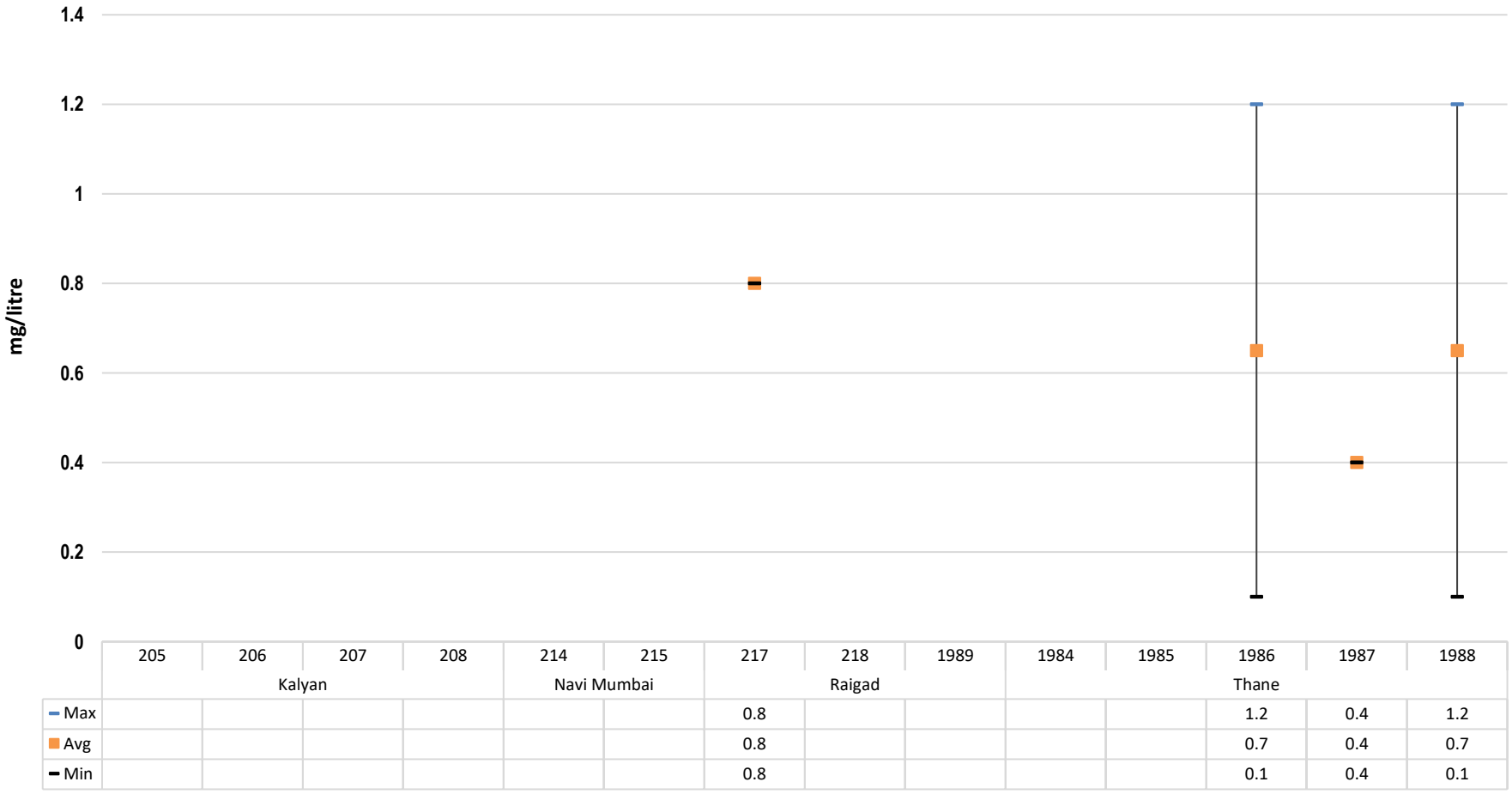
	2828	209	210	211	212	213	1994	1995	1996	1997	1998	1999	2000	2203	2826	2827
	Chandrapur								Nagpur							
Max	354.0	302.0		300.0	342.0	356.0	262.0	346.0	350.0	250.0	348.0	212.0		170.0	262.0	
Avg	305.0	302.0		288.0	342.0	356.0	241.0	346.0	350.0	250.0	348.0	212.0		170.0	218.0	
Min	256	302		276	342	356	220	346	350	250	348	212		170	174	

Figure No. 70: Parametric values of Hardness at $CaCO_3$ recorded at WQMS monitoring ground water at Chandrapur and Nagpur



	219	220	2004	2005	2006	2007	2008	2202	2829	2830	2831	2832	2833	2834	2835	1992	2819	2820	2821	2822	2823
	Kolhapur															Pune					
Max	48.0	40.0	1540.0	422.0	262.0	840.0	820.0	162.0	154.0	190.0	366.0	124.0	110.0	5000.0	32.0	206.0	1064.0	520.0	1060.0	1160.0	1310.0
Avg	48.0	40.0	1166.0	397.0	197.0	566.0	556.0	99.0	134.0	179.0	366.0	78.0	79.0	2535.0	30.0	178.0	942.0	293.0	1060.0	1160.0	1310.0
Min	48	40	792	372	132	292	292	36	114	168	366	32	48	70	28	150	820	66	1060	1160	1310

Figure No. 71: Parametric values of Hardness at $CaCO_3$ recorded at WQMS monitoring ground water at Kolhapur and Pune

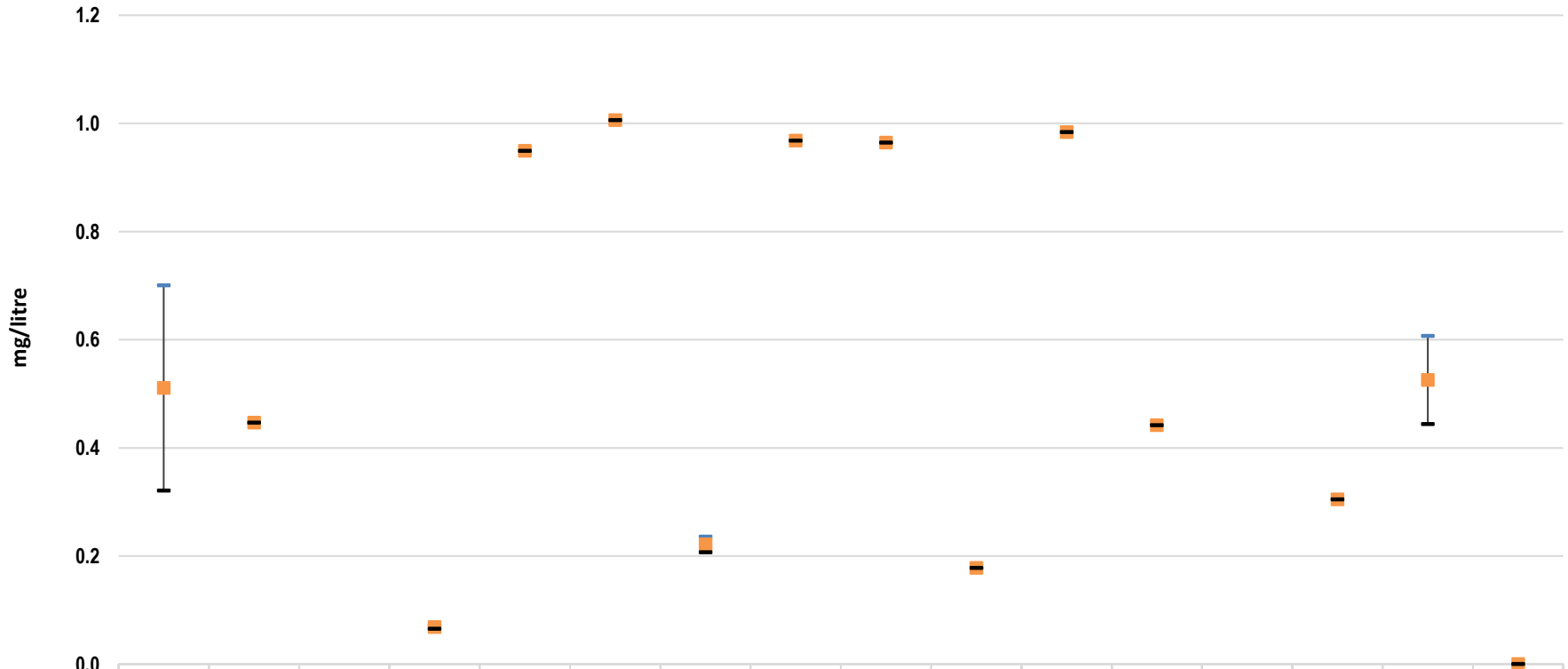


	205	206	207	208	214	215	217	218	1989	1984	1985	1986	1987	1988
	Kalyan				Navi Mumbai		Raigad			Thane				
Max							0.8					1.2	0.4	1.2
Avg							0.8					0.7	0.4	0.7
Min							0.8					0.1	0.4	0.1

Figure No. 72: Parametric values of Fluoride recorded at WQMS monitoring ground water at Kalyan, Navi Mumbai, Raigad and Thane

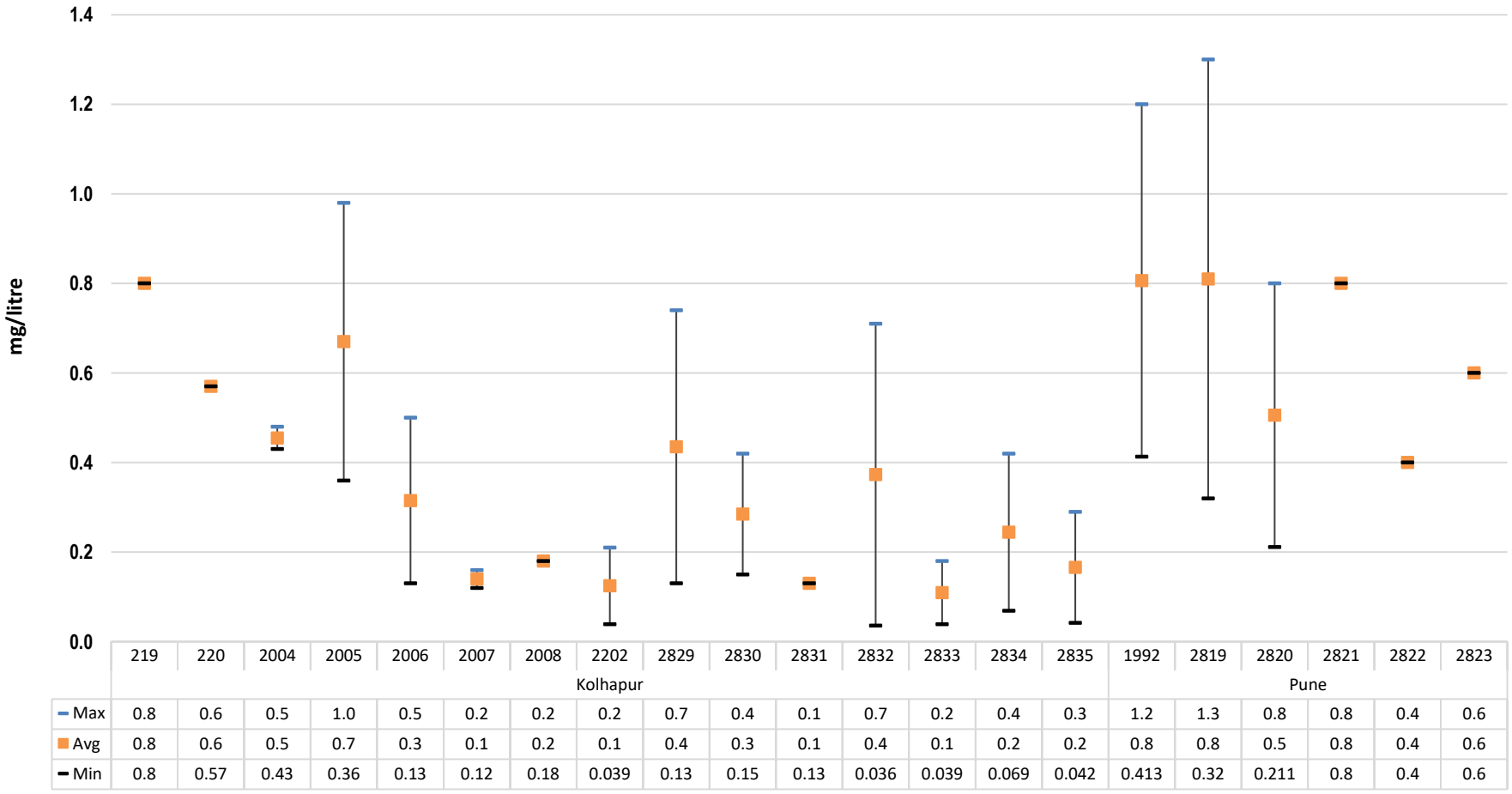
	2001	2002	2003	1993	2200	2201	2824	2825	221	1990	1991	2204	2816	2817	2818
	Amravati			Aurangabad					Nashik						
Max		0.3	0.6	0.9	0.8			0.5							
Avg		0.3	0.5	0.9	0.8			0.5							
Min		0.3235	0.3539	0.9	0.8			0.5							

Figure No. 73: Parametric values of Fluoride recorded at WQMS monitoring ground water at Amravati, Aurangabad and Nashik



	2828	209	210	211	212	213	1994	1995	1996	1997	1998	1999	2000	2203	2826	2827
	Chandrapur								Nagpur							
Max	0.7	0.4		0.1	0.9	1.0	0.2	1.0	1.0	0.2	1.0	0.4		0.3	0.6	0.0
Avg	0.5	0.4		0.1	0.9	1.0	0.2	1.0	1.0	0.2	1.0	0.4		0.3	0.5	0.0
Min	0.3208	0.4466		0.0654	0.9491	1.006	0.2067	0.9684	0.9644	0.1779	0.9842	0.4417		0.3047	0.4439	0

Figure No. 74: Parametric values of Fluoride recorded at WQMS monitoring ground water at Chandrapur and Nagpur.



	219	220	2004	2005	2006	2007	2008	2202	2829	2830	2831	2832	2833	2834	2835	1992	2819	2820	2821	2822	2823
	Kolhapur															Pune					
Max	0.8	0.6	0.5	1.0	0.5	0.2	0.2	0.2	0.7	0.4	0.1	0.7	0.2	0.4	0.3	1.2	1.3	0.8	0.8	0.4	0.6
Avg	0.8	0.6	0.5	0.7	0.3	0.1	0.2	0.1	0.4	0.3	0.1	0.4	0.1	0.2	0.2	0.8	0.8	0.5	0.8	0.4	0.6
Min	0.8	0.57	0.43	0.36	0.13	0.12	0.18	0.039	0.13	0.15	0.13	0.036	0.039	0.069	0.042	0.413	0.32	0.211	0.8	0.4	0.6

Figure No. 75: Parametric values of Fluoride recorded at WQMS monitoring ground water at Kolhapur and Pune.

Water Quality Index for ground water at Kalyan, Navi Mumbai, Raigad and Thane.

Apr	Dry	Dry	Dry	Dry	Dry	117	Dry	Dry	42	Dry	267	110	167	232
Oct	Dry	Dry	Dry	Dry	Dry	92	40	Dry	28	Dry	146	77	85	315
Station code	205	206	207	208	214	215	217	218	1989	1984	1985	1986	1987	1988
RO	Kalyan				Navi Mumbai		Raigad			Thane				

Legend

Excellent	Good	Poor	Very Poor	Not suitable for drinking	Dry	No data

Table No. 30: Ground water quality monitoring stations at Kalyan, Navi Mumbai, Raigad and Thane.

Programme	Regional Office	Station ID	Station Name	District	Taluka	Type of well	Village
SWMP	Kalyan	205	Dug well opp. KAMA office, MIDC Ph-I, Dombivali	Kalyan	Dombivali	Dug well	MIDC,Dombivali
SWMP	Kalyan	206	Dug well near Mamta Hospital, Milap Nagar, Dombivali	Kalyan	Dombivali	Dug well	MIDC,Dombivali
SWMP	Kalyan	207	Dug well at pimpleshwar Temple, MIDC Ph-II, Dombivali	Kalyan	Dombivali	Dug well	MIDC,Dombivali
SWMP	Kalyan	208	Dug well addjusent to M/S. Altra pure chem., Sr. No. 45, Hissa No. 3, MIDC Ph-II, Dombivali.	Kalyan	Dombivali	Dug well	MIDC,Dombivali
SWMP	Navi Mumbai	214	Borewell at TTCWMA, Mahape	Thane	Thane	Borewell	TTCWMA,Mahape

Programme	Regional Office	Station ID	Station Name	District	Taluka	Type of well	Village
SWMP	Navi Mumbai	215	Well water at Turbhe Store, Turbhe	Thane	Thane	Well	Turbhe
SWMP	Raigad	217	Borewell water at village Milgaon, Taluka - Khalapur, District - Raigad.	Raigad	Khalapur	Borewell	Milgaon
SWMP	Raigad	218	Borewell water near MSW site, Murud - Janjira.			Borewell	Murud Janjira
NWMP	Raigad	1989	Bore well at MWML Site at Taloja	Raigad	Panvel	Bore well	Karawla- Taloja
NWMP	Thane	1984	Bore well at M/s Tata Iron {} Steel Co. Ltd, S-76	Thane	Palghar	Bore well	MIDCTarapur, Industrial Estate, Tarapur
NWMP	Thane	1985	Dug well at 5 Star Industrial Estate	Thane	Mira-Bhayander	Dug well	Kashimira
NWMP	Thane	1986	Bore well at Motapada	Thane	Dahanu	Bore well	Motapada
NWMP	Thane	1987	Bore well at Vasai	Thane	Vasai	Bore well	Gokhiware
NWMP	Thane	1988	Bore well at Gharatwadi, Palghar	Thane	Palghar	Bore well	Aliyali

Water Quality Index for ground water at Nashik , Amravati and Aurangabad.

Apr	Dry	72	143	No Data	No Data	Dry	Dry	No Data	77	Dry	Dry	Dry	Dry	Dry	Dry
Oct	Dry	No Data	117	304	99	No Data	No Data	215	124	No Data	No Data	No Data	No Data	No Data	No Data
Station code	2001	2002	2003	1993	2200	2201	2824	2825	221	1990	1991	2204	2816	2817	2818
RO	Amravati			Aurangabad					Nashik						

Legend

Excellent	Good	Poor	Very Poor	Not suitable for drinking	Dry	No data

Table No. 31: Ground water quality monitoring stations at Amravati, Aurangabad and Nashik.

Program	Regional Office	Station ID	Station Name	District	Taluka	Type of Well	Village
NWMP	Amravati	2001	Tube well at water treatment plant of M.C.Achalpur near Post Office.	Amravati	Achalpur	Tube well	Paratwada
NWMP	Amravati	2002	Bore well Opp. Gajanan Maharaj Temple at Anjangaon road.	Akola	Akot	Bore well	Anjangaon
NWMP	Amravati	2003	Dug well at Plot No- 4, Street No. 49-C, at Nehru Bal Udyan Azad Maidan, owned by Yavatmal M.C.	Yavatmal	Yavatmal	Dug well	Nehru Bal Udyan Azad Maidan
NWMP	Aurangabad	1993	Dug well at Pandarpur, Gangapur, Aurangabad	Aurangabad	Gangapur	Dug well	Pandharpur
NWMP	Aurangabad	2200	Bore Well at Katpur, Near Z.P.School	Aurangabad	Paithan	Bore well	Katpur

Program	Regional Office	Station ID	Station Name	District	Taluka	Type of Well	Village
NWMP	Aurangabad	2201	Dug Well at Ranjangaon	Aurangabad	Gangapur	Dug well	Ranjangaon
NWMP	Aurangabad	2824	Dug Well at Naregaon	Aurangabad	Aurangabad	Dug well	Naregaon
NWMP	Aurangabad	2825	Bore Well at Wahegaon, near Zilla Parishet School	Aurangabad	Paithan	Bore well	Wahegaon
SWMP	Nashik	221	well water of Bappaji, Akolner, Ahmadnagar, Nashik	Nashik	Ahmadnagar	well	Akolner
NWMP	Nashik	1990	Bore well at BMW Site , Burudgaon	Ahmadnagar	Ahmednagar	Bore well	Burudgaon
NWMP	Nashik	1991	Bore well at MSW Site, Pathardi, Nashik	Nashik	Nashik	Bore well	Pathardi
NWMP	Nashik	2204	Dug well at Gunjalwadi, Sangamner near Primary Health Care Center.	Ahmadnagar	Sangamner	Dug well	Gunjalwadi
NWMP	Nashik	2816	Dug Well of Mr. Sampat Walunj, near M/s. Mahajeet Clayton	Nashik	Nashik	Dug well	Shinde village
NWMP	Nashik	2817	Bore Well at Chitali near Wagh vasthi	Ahmadnagar	Rahata	Bore well	Chitali
NWMP	Nashik	2818	Bore Well at M/s. Spectron Ethers Rasegaon near Siddeshwar Mahadev Mandir	Nashik	Dindori	Bore well	Rasegaon

Water Quality Index for ground water at Nagpur and Chandrapur.

Apr	116	Dry	Dry	96	104	114	94	118	102	84	116	73	No Data	Dry	102	Dry
Oct	132	109	Dry	96	Dry	Dry	141	No Data	No Data	No Data	No Data	No Data	No Data	74	77	No Data
Station code	2828	209	210	211	212	213	1994	1995	1996	1997	1998	1999	2000	2203	2826	2827
RO	Chandrapur	Nagpur														

Legend

Excellent	Good	Poor	Very Poor	Not suitable for drinking	Dry	No data

Table No. 32: Ground water quality monitoring stations at Chandrapur and Nagpur.

Programme	Regional Office	Station ID	Station Name	District	Taluka	Type of Well	Village
NWMP	Chandrapur	2828	Dug Well near Jilla Parishad Primary School Visapur	Chandrapur	Ballarpur	Dug well	Visapur
SWMP	Nagpur	209	Bore well near Pardhi House, Bhandewadi, Nagpur	Nagpur	Bhandewadi	Borewell	Bhandewadi
SWMP	Nagpur	210	Bore well near Dearao Kale House, Bhandewadi, Nagpur	Nagpur	Bhandewadi	Bore well	Bhandewadi
SWMP	Nagpur	212	Grampanchayat Mhasala, Dugwell On Nalla At Mhasala, Taluka - Kamptee, District - Nagpur	Nagpur	Kamptee	Dug well	Mhasala
SWMP	Nagpur	213	Grampanchayat Kawtha, Dugwell At Kawtha, Taluka - Kamptee, District - Nagpur	Nagpur	Kamptee	Dug well	Kawtha

Programme	Regional Office	Station ID	Station Name	District	Taluka	Type of Well	Village
NWMP	Nagpur	1994	Dug well At TPS Durgapur near Naseeb Kirana {} general Store.	Chandrapur	Chandrapur	Dug well	Durgapur
NWMP	Nagpur	1995	Gram Panchayath Dug well , Near Balaji Gajbhiye House, Khaperkheda	Nagpur	Saoner	Dug well	Khaperkheda(Ward No.4)
NWMP	Nagpur	1996	Gram Panchayath Dug well , Near Jagadamba G M S Mandir Sahakari Sanstha	Nagpur	Kamptee	Dug well	Koradi
NWMP	Nagpur	1997	Bore well near Primary Health Centre, Raipur(Hingna)	Nagpur	Hingna	Bore well	Raipur
NWMP	Nagpur	1998	Gram Panchayat Dug well near Gram Panchayat Office, Brahmni	Nagpur	Kalmeshwar	Dug well	Brahmni
NWMP	Nagpur	1999	Bore well Near Gram Panchayat, Changera.	Gondia	Gondia	Bore well	Changera
NWMP	Nagpur	2000	Dug well near Sarode Kirana Store, Bhandewadi, Nagpur	Nagpur	Nagpur	Dug well	Bhandewadi
NWMP	Nagpur	2203	Hand Pump in the premises of Z.P.Primary School	Wardha	wardha	Hand pump	Bhugaon
NWMP	Nagpur	2826	Dug Well near Railway Station, Cottaon Market	Wardha	wardha	Dug well	Wardha
NWMP	Nagpur	2827	Bore Well near Railway crossing at Dongi Buzurg	Bandara	Tumsar	Bore well	Dongri-Buzurg

Water Quality Index for ground water at Kolhapur and Pune.

Apr	35	29	362	134	51	271	262	58	61	62	No Data	50	47	1338	25	72	250	32	No Data	No Data	No Data
Oct	Dry	Dry	262	127	75	86	85	20	54	65	94	21	23	31	21	66	385	151	410	352	447
Station code	219	220	2004	2005	2006	2007	2008	2202	2829	2830	2831	2832	2833	2834	2835	1992	2819	2820	2821	2822	2823
RO	Kolhapur																Pune				

Legend

Excellent	Good	Poor	Very Poor	Not suitable for drinking	Dry	No data

Table No. 33: Ground water quality monitoring stations at Kolhapur and Pune.

Programme	Regional Office	Station ID	Station Name	District	Taluka	Type of Well	Village
SWMP	Kolhapur	219	Commen well Water At Patwardhan, Lote, Taluka - Khed, District – Rantnagiri	Ratnagiri	Khed	Well	Lote
SWMP	Kolhapur	220	Dugwell backside Excel India At Chalkewadi, Taluka - Khed, District - Ratnagiri.	Ratnagiri	Khed	Dug well	Chalkewadi
NWMP	Kolhapur	2004	Bore well at Parvati Industrial Estate, Yadrav, Kolhapur	Kolhapur	Shirol	Bore well	Yadrav
NWMP	Kolhapur	2005	Bore well at Khanjirenagar, Kolhapur	Kolhapur	Hatkanangale	Bore well	Khanjirenagar
NWMP	Kolhapur	2006	Bore well at Shinoli near M/s Aqua Alloy Steel.	Kolhapur	Chandgad	Bore well	Shinoli
NWMP	Kolhapur	2007	Bore well at Savali, near Gram Panchayat office.	Sangli	Miraj	Bore well	Savali

Programme	Regional Office	Station ID	Station Name	District	Taluka	Type of Well	Village
NWMP	Kolhapur	2008	Dug well at Sambarwadi, owned by Shri. Kishan Hali Rajput.	Sangli	Miraj	Dug well	Sambarwadi
NWMP	Kolhapur	2202	Dug Well at Ghane Kunt, near Awashi, onwed by shri Rajendra Amre	Ratnagiri	Khed	Dug well	Ghane Kunt
NWMP	Kolhapur	2829	Bore Well at MIDC Shiroli near M/s. Pratibha Enterprises	Kolhapur	Hatkanangale	Bore well	Shiroli
NWMP	Kolhapur	2830	Bore Well at MIDC Gokul Shirgaon	Kolhapur	Karvir	Bore well	Gokul-Shirgaon
NWMP	Kolhapur	2831	Dug Well at Sakharali near MIDC Islampur near Krishna Milk Industry	Sangli	Walwa	Dug well	Sakharali
NWMP	Kolhapur	2832	Dug Well No.1 at Brahmanwadi-Anjanwel, owned by Shri Vaidya	Ratnagiri	Guhagar	Dug well	Anjanwel
NWMP	Kolhapur	2833	Dug Well No.1 at Group Gram Panchayat at Arketwadi, near Masjid	Ratnagiri	Khed	Dug well	Arketwadi
NWMP	Kolhapur	2834	Dug Well No.2 at Arketwadi	Ratnagiri	Khed	Dug well	Arketwadi
NWMP	Kolhapur	2835	Dug Well No.2 at owned by Group Gram Panchayat, Brahmanwadi-Anjanwel	Ratnagiri	Guhagar	Dug well	Anjanwel
NWMP	Pune	1992	Dug well at MSW Site, owned by Shri.Dattu Kondiba Borate at Borate Vasthi.	Pune	Haveli	Dug well	Moshi
NWMP	Pune	2819	Dug Well Owned by Shri Deshmukh	Pune	Baramati	Dug well	Malegaon
NWMP	Pune	2820	Dug Well Owned by Shri Shivaji Baban Darekar	Pune	Shirur	Dug well	Sanaswadi
NWMP	Pune	2821	Bore Well at Bale Railway Station premises Owned by Shri Digambar Joshi	Solapur	North Solapur	Bore well	Dahegaon
NWMP	Pune	2822	Bore Well near Chincholi	Solapur	Mohol	Bore well	Chincholi
NWMP	Pune	2823	Bore Well at Shete Vasti near old Tuljapur Road	Solapur	Solapur	Dug well	Shete vasthi, Tuljapur Naka

Spatial map for Ground WQI in Maharashtra 2019-20 (April 2019)

Spatial map for Ground WQI in Maharashtra 2019-20 (October 2019)

Conclusion

The year 2019-20 witnessed a considerable shift in percentages of observations recorded under 'Non-polluted' WQI category (Good to excellent and Medium to Good) as compared to previous year (2018-19). Out of total observations recorded (2736), around 76% of the observations were categorized in this category. In the year 2018-19, the same category recorded around 71% of the total observations. This indicates modest improvement in water quality and decrease in pollution/pollutants level. Around 14% of the total observations were recorded as 'Dry'.

At basin level, Bhima Upper (sub basin); coming under Krishna basin recorded around 67% of the total observations (as compared to 55% in 2018-19) under 'Non-polluted' (Good to Excellent and Medium to Good) category while Krishna Upper recorded over 96% observations in non-polluted category. In case of Godavari sub-basins, the share of observations coming under the'Non-polluted' category was as follows - Godavari Upper (82%), Godavari Middle (70%), Manjra (54%), Wardha (84%), Wainganga (71%) and Pranhita & others (100%).

As compared to other basins, Tapi basin recorded considerably lower % of observations in non-polluted category. Around 57% (Tapi Upper) and around 35% (Tapi Lower) observations were recorded under this category which indicates higher level of pollution in the waters of Tapi basin. This might be due to high levels of existing anthropogenic preesures in the surrounding areas.

The assessment of WQI of West flowing rivers indicated that majority of the observations (89%) were recorded under the 'Good to excellent' category. Further, the observations under 'Medium to Good' decreased from 3.8% to 2.2% and 'Bad to Very Bad' decreased from 2.6% to 1.2% in 2019-20, as compared to the previous year.

In case of Priority ranking, as compared to 4 rivers placed in Priority I category in 2018-19; only 1 river (Mithi) fell into this category in 2019-20. Of the remaining 3 rivers (2018-19), Morna and Wainganga were observed in Priority III in 2019-20 whereas Godavari River was placed in Priority II. 6 Rivers namely Bhima, Godavari, Kanhan, Mutha, Pawna and Urmodi were found to be in Prioirity II; while 12 rivers namely Chandrabhaga, Indrayani, Kundalika, Morna, Mula, Mula- Mutha, Nira, Patalganga, Rangavali, Sina, Wainganga and Wardha were under Priority III. Further, 12 rivers namely Ghod, Koyna, Krishna, Manjara, Mor, Panzara, Pedhi, Penganga, Tapi, Vel, Venna and Wena were found to be placed under category IV. Category V observed inclusion of 21 rivers in 2019-20 as compared to 15 in the previous year (2018-19). Only 1 river (Panchganga) was found to be less polluted (BOD less than 3 mg/l).

In term of Groundwater, 3 WQMS recorded WQI under 'Water Unsuitable for Drinking'. Out of this the WQMS at Ratnagiri district (Dug Well No. 2 Arketwadi) recorded annual average WQI as 684 with high levels of average concentration for parameters such as Total Hardness (2,535 mg/l), Magnesium (1,119 mg/l), Chlorides (1,818 mg/l), and Calcium (1,416 mg/l) and Total Dissolved solids (5,813 mg/l). About 19 WQMS out of total WQMS for groundwater

were 'Dry' throughout the year. About 27 WQMS (10 in Nagpur followed by 10 in Kolhapur, 2 each in Pune, Raigad, 1 in Aurangabad ,Amravati and Thane were seen under Non polluted category throughout the year.

Annex I – RO wise summary of WQI in 2019-20

The Maharashtra State government in 1981 adopted the Water (Prevention and Control of Pollution) Act 1974 and under this MPCB (Maharashtra Pollution Control Board) was established in the year 1981.

The main functions of MPCB are:

- To plan a comprehensive program for the prevention, control or abatement of pollution and secure executions thereof,
- To collect and disseminate information relating to pollution and the prevention, control or abatement thereof,
- To inspect sewage or trade effluent treatment and disposal facilities, and air pollution control systems and to review plans, specification or any other data relating to the treatment plants, disposal systems and air pollution control systems in connection with the consent granted,
- Supporting and encouraging the developments in the fields of pollution control, waste recycle reuse, eco-friendly practices etc.
- To educate and guide the entrepreneurs in improving environment by suggesting appropriate pollution control technologies and techniques
- To create public awareness about clean and healthy environment and attending the public complaints regarding pollution.

Being a highly industrialized, populated and urbanized state, Maharashtra has numerous sources which lead to water pollution, which have deteriorated the water quality of many, seas, creeks, drains ground water and so on. Release of sewage, industrial waste water, and dumping of solid waste are the three major causes of water pollution.

Hence, to keep a constant vigilance MPCB has established 12 RO (Regional Offices) across the state to check and regulate the pollution levels with necessary control measures. MPCB implements a range of environmental legislation in the state and functions under the administrative control of Environment Department, Government of Maharashtra.

The following section presents the RO wise highlights on the status of the water quality monitoring network for the year 2019-20 and presents the gist of the water quality index for the respective stations for months of April and December/October.

RO – Amravati

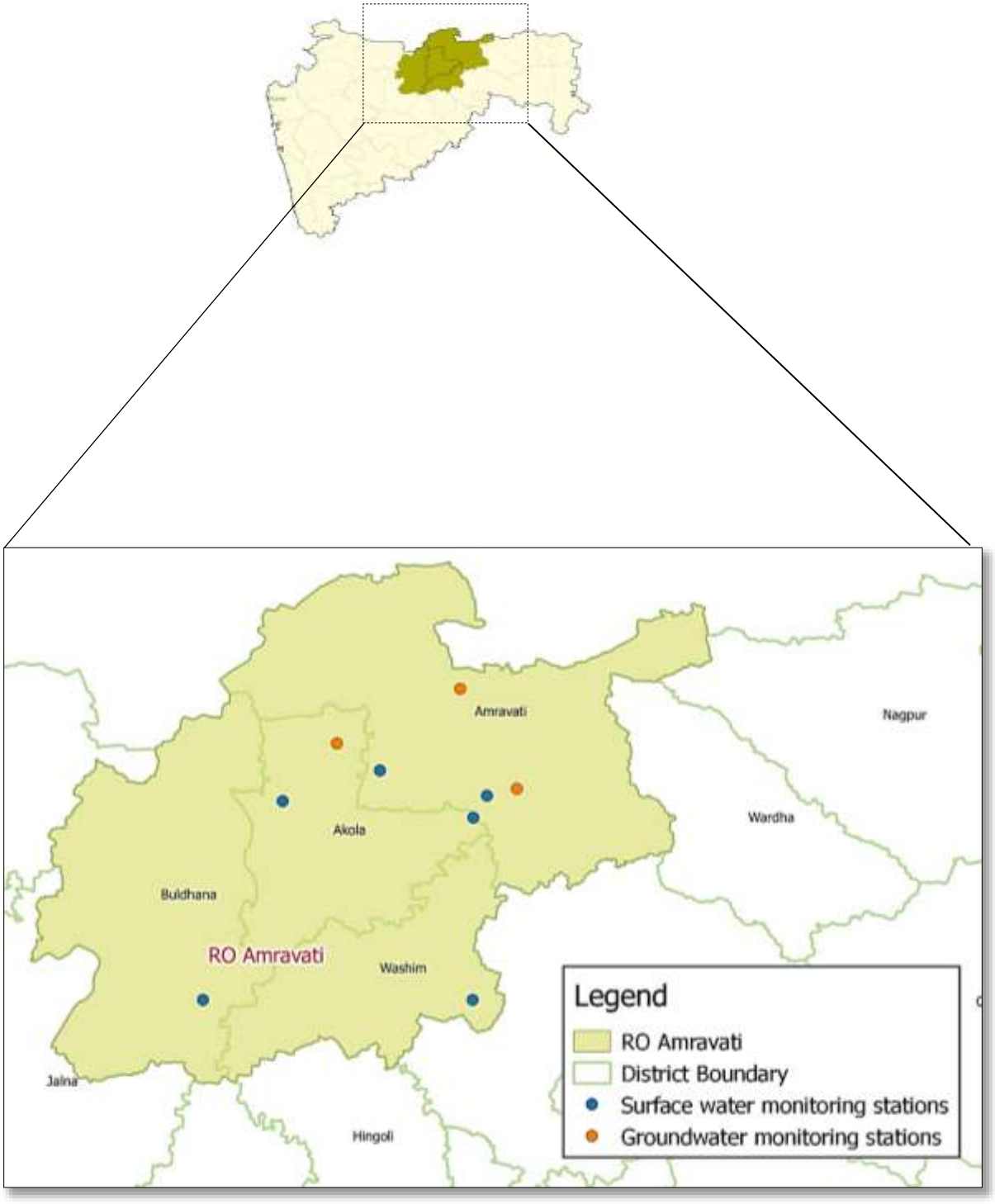

Amravati
Nagpur
Akola
Wardha
Buldhana
RO Amravati
Washim
Jalna
Hingoli
Legend
RO Amravati
District Boundary
Surface water monitoring stations
Groundwater monitoring stations

Table No. 34: Water quality Index for surface and ground water monitoring at Amravati-RO – 2019-20

Type	Station Code	Station Name	Apr	Dec/Oct	Average	District	Taluka	Village
SW	1913	Purna River at Dhupeshwar at U/s of Malkapur Water works	78	72	73	Akola	Akola	Malkapur
	2155	Purna River at D/s of confluence of Morna & Purna at Andhura village	Dry	72	75	Akola	Balapur	Andura
	2675	Morna River at D/s of Railway Bridge	Dry	54	72	Akola	Akola	Akola
	2695	Pedhi River near Road Bridge at Dadhi-Pedhi village	Dry	71	65	Amravati	Chandur Bazar	Asegaon
	2697	Penganga River near water supply scheme of Umarkhed MC	75	69	72	Yavatmal	Umarkhed	Belkhed
	2698	Penganga River D/s of Isapur Dam	66	73	72	Yavatmal	Pusad	Isapur
	2699	Penganga River at Mehkar-Buldana Road Bridge	Dry	72	74	Buldana	Mehkar	Mehkar
	2700	Purna River near Achalpur-Amravati Road Bridge, Asegaon	Dry	Dry	73	Amravati	Chandur bazaar	Asegaon
GW	2001	Tube well at water treatment plant of M.C.Achalpur near Post Office.	Dry	Dry	Dry	Amravati	Achalpur	Paratwada
	2002	Bore well Opp. Gajanan Maharaj Temple at Anjangaon road.	72	No Data	36	Akola	Akot	Anjangaon
	2003	Dug well at Plot No- 4, Street No. 49-C, at Nehru Bal Udyan Azad Maidan, owned by Yavatmal M.C.	142	117	129	Yavatmal	Yavatmal	Nehru Bal Udyan Azad Maidan

Surface Water		Good to Excellent	Medium to Good	Bad	Bad to Very Bad	Dry	Not collected	No Data
Ground Water	Excellent	Good	Poor	Very Poor	Not suitable for drinking	Dry	Not collected	No Data

RO – Aurangabad

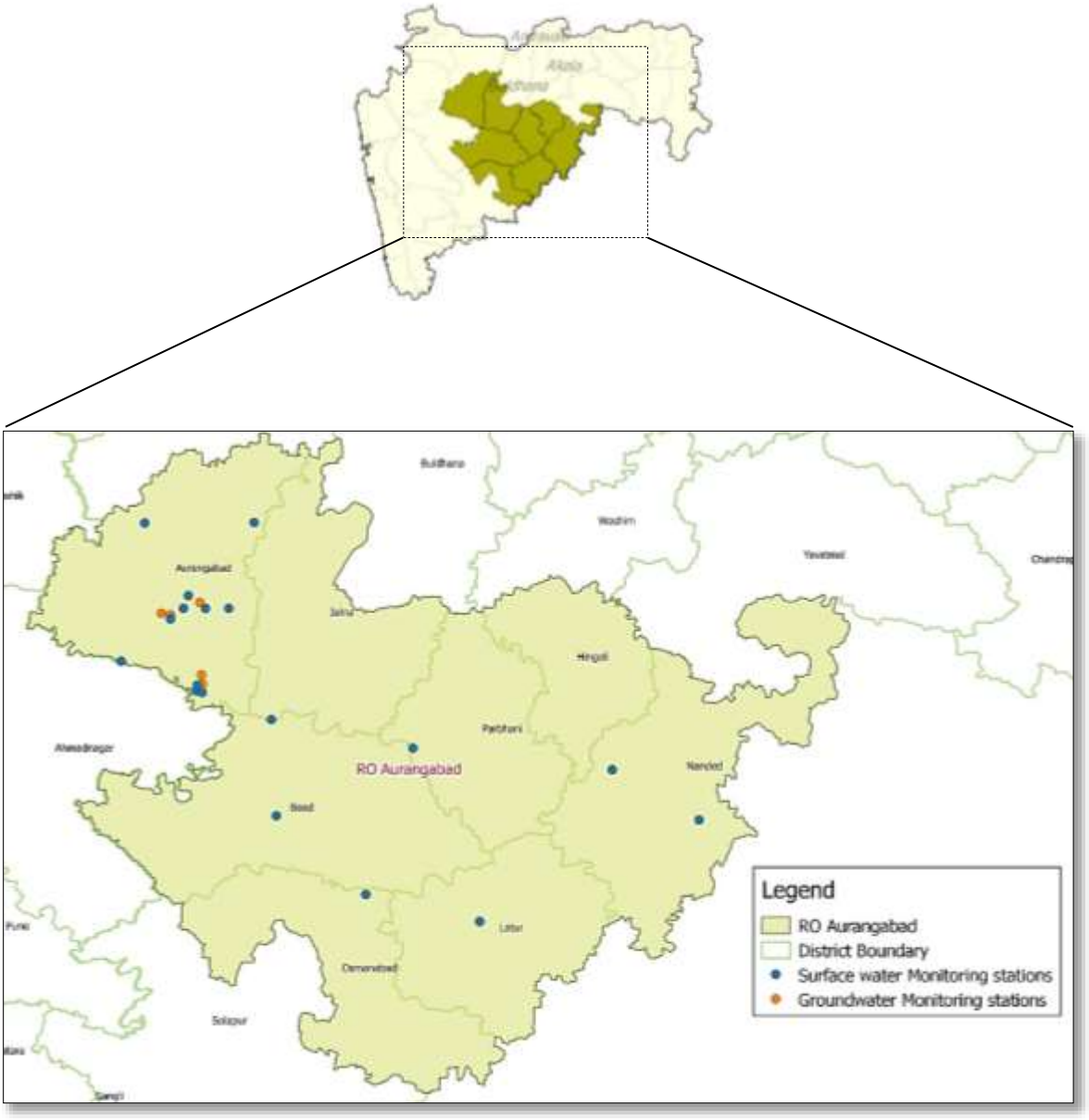


Table No. 35: Water quality Index for surface and ground water monitoring at Aurangabad-RO – 2019-20

Type	Station Code	Station Name	Apr	Dec/Oct	Average	District	Taluka	Village
SW	12	Godavari River at Dhalegaon	88	89	86	Parbhani	Pathari	Dhalegaon
	178	Kannad - D/S of Kannad near Bridge	Dry	81	75	Aurangabad	Kannad	Kannad
	179	Sillod - D/S of Sillod near bridge at bhavan	Dry	84	82	Aurangabad	Sillod	Sillod
	180	Aurangabad - Near Holly cross bridge	44	41	55	Aurangabad	Aurangabad	Aurangabad
	181	Aurangabad - Near Patoda Village	55	44	56	Aurangabad	Aurangabad	Aurangabad
	182	Aurangabad - Near Chikhalthana Bridge	Dry	Dry	62	Aurangabad	Aurangabad	Aurangabad
	183	Aurangabad - At Sukhna Dam	Dry	50	68	Aurangabad	Aurangabad	Aurangabad
	184	Aurangabad - Harsool Dam	Dry	83	80	Aurangabad	Aurangabad	Aurangabad
	1209	Godavari River at Raher	Dry	87	84	Nanded	Nayagaon	Raher
	1210	Godavari River at Intake of pump house	91	87	86	Nanded	Nanded	Vishnupuri
	1312	Godavari river at Jaikwadi Dam, Paithan	86	86	87	Aurangabad	Paithan	Paithan
	2157	Godavari River at Latur Water intake near pump house	83	86	86	Osmanabad	Kalumb	Dhamegaon
	2158	Godavari River at Paithan U/s of Paithan Intake pump house	83	87	87	Aurangabad	Paithan	Jayakwadi
	2159	Godavari River at D/s of Paithan at Pathegaon bridge	88	86	87	Aurangabad	Paithan	Pathegaon
	2160	Godavari River at U/s of Aurangabad Reservoir Kaigaon Tokka near, Kaigaon Bridge	90	89	87	Aurangabad	Gangapur	Kaigaon
	2161	Godavari River at Jalna Intake water pump house Shahagad	87	86	87	Jalna	Ambad	Shahabad
	2657	Bindusara River at Beed, near Intake water pump house at Dam	86	88	86	Beed	Beed	Paligaon
	2673	Manjra River at D/s of Latur, near Latur-Nanded Bridge	Dry	86	84	Latur	Latur	Bhatkheda
GW	1993	Dug well at Pandarpur, Gangapur, Aurangabad	No Data	304	152	Aurangabad	Gangapur	Pandharpur
	2200	Bore Well at Katpur, Near Z.P.School	Dry	99	50	Aurangabad	Paithan	Katpur
	2201	Dug Well at Ranjangaon	No Data	Dry	No Data	Aurangabad	Gangapur	Ranjangaon
	2824	Dug Well at Naregaon	No Data	No Data	No Data	Aurangabad	Aurangabad	Naregaon
	2825	Bore Well at Wahegaon, near Zilla Parishet School	No Data	215	108	Aurangabad	Paithan	Wahegaon

Surface Water		Good to Excellent	Medium to Good	Bad	Bad to Very Bad	Dry	Not collected	No Data
Ground Water	Excellent	Good	Poor	Very Poor	Not suitable for drinking	Dry	Not collected	No Data

RO – Chandrapur

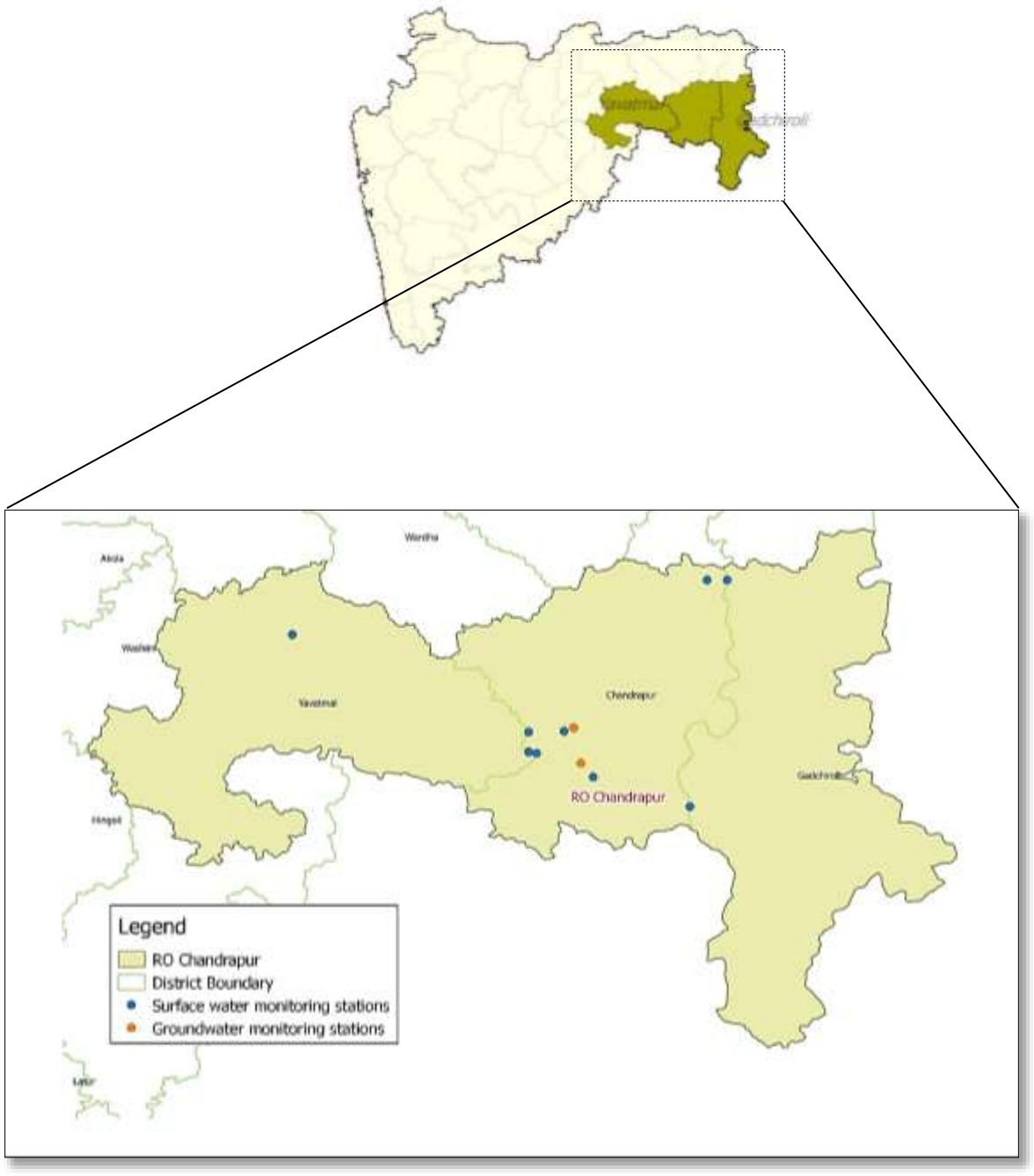


Table No. 36: Water quality Index for surface and ground water monitoring at Chandrapur RO – 2019-20

Type	Station Code	Station Name	Apr	Dec/Oct	Average	District	Taluka	Village
SW	11	Wainganga River at Ashti	63	69	70	Chandrapur	Gondpipri	Ashti
	1212	Wardha river at Rajura bridge	60	70	69	Chandrapur	Chandrapur	Rajura
	2156	Wardha River at confluence point of Penganga & Wardha	68	73	71	Yavatmal	Wani	Jugad
	2174	Wardha River at D/s of ACC Ghuggus	74	75	73	Chandrapur	Chandrapur	Ghuggus
	2175	Wainganga at U/s of Gaurav Paper Mills near Jack Well	73	72	74	Chandrapur	Chandrapur	Bramhpuri
	2176	Wainganga River at D/s of Gaurav Paper Mills Near Jackwell	67	72	74	Chandrapur	Chandrapur	Bramhpuri
	2719	Wardha River at D/s of Erai River	53	71	70	Chandrapur	Chandrapur	Hadasti
	2720	Wardha River at U/s of Erai River	59	71	72	Chandrapur	Chandrapur	Hadasti
	2721	Wardha River at U/s of ACC Ghuggus	70	74	73	Chandrapur	Chandrapur	Ghuggus
GW	1994	Dug well at TPS Durgapur near Naseeb Kirana {} general Store.	95	141	118	Chandrapur	Chandrapur	Durgapur
	2828	Dug Well near Jilla Parishad Primary School Visapur	117	132	124	Chandrapur	Ballarpur	Visapur

Surface Water		Good to Excellent	Medium to Good	Bad	Bad to Very Bad	Dry	Not collected	No Data
Ground Water	Excellent	Good	Poor	Very Poor	Not suitable for drinking	Dry	Not collected	No Data

RO – Kalyan

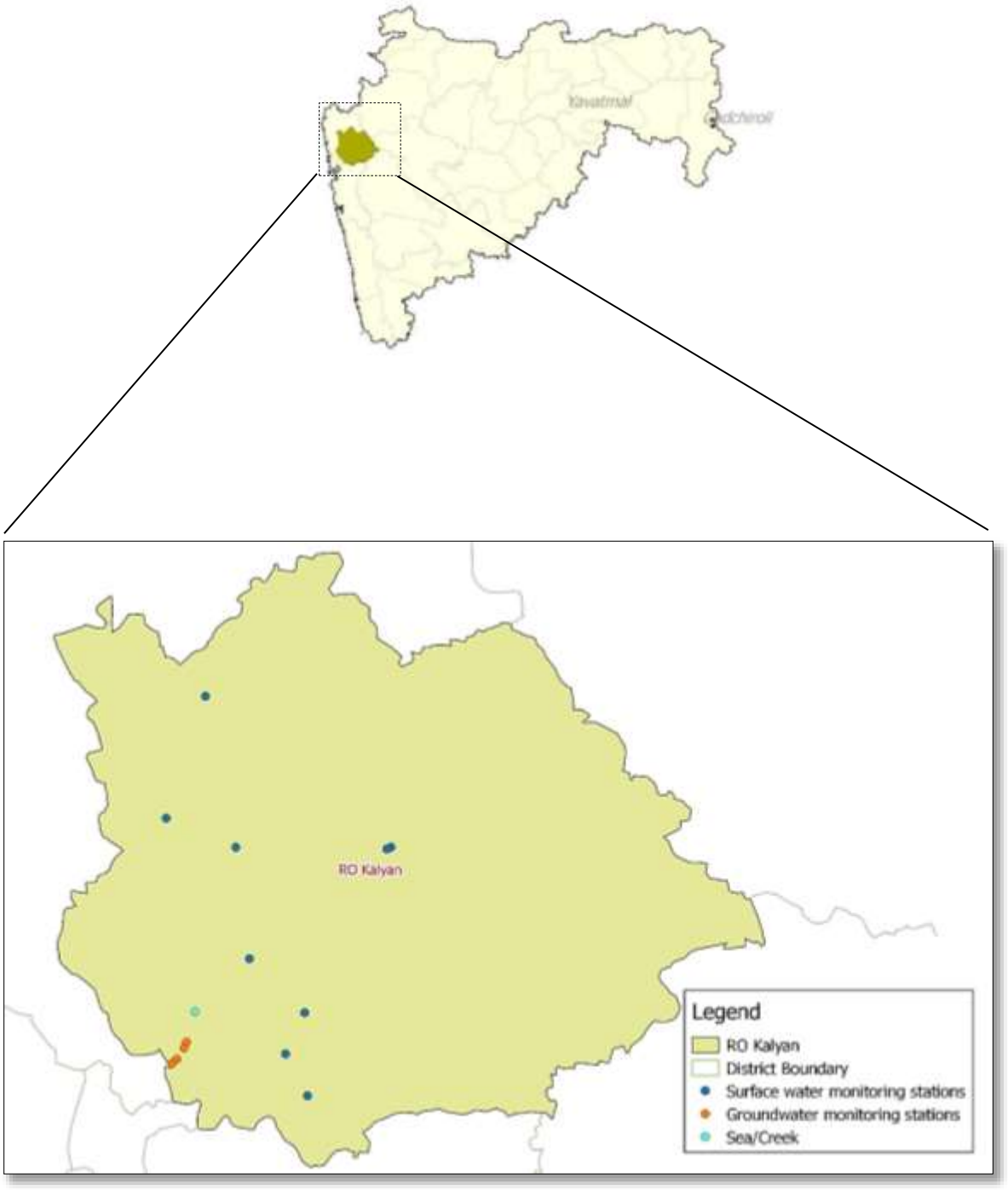

RO Kalyan
Legend
RO Kalyan
District Boundary
Surface water monitoring stations
Groundwater monitoring stations
Sea/Creek

Table No. 37: Water quality Index for surface and ground water monitoring at Kalyan-RO – 2019-20

Type	Station Code	Station Name	Apr	Dec/ Oct	Average	District	Taluka	Village
SW	1092	Kalu River at Atale village	79	78	79	Thane	Kalyan	Atale
	1093	Ulhas river at U/s of NRC Bund	82	79	77	Thane	Kalyan	Mohane
	1094	Ulhas River at U/s of Badlapur water works	84	80	77	Thane	Ambernath	Kulgaon
	1461	Bhatsa river at D/s of Pise Dam	78	84	80	Thane	Bhiwandi	Pise
	2162	Ulhas River at Jambhul water works	85	79	81	Thane	Ambernath	Jambhul
	2653	Bhatsa River at D/s of Liberty Oil Mills	80	85	78	Thane	Shahapur	Satne
	2654	Bhatsa River at D/s of Liberty Oil Mills	78	85	76	Thane	Shahapur	Satne
	2709	Tansa River near road bridge	Dry	86	79	Thane	Wada	Dakewali
	2712	Vaitarna River near Road Bridge	Dry	79	79	Thane	Wada	Gandhare
Saline	2791	Ulhas Creek at Reti Bunder, D/s of Kalyan-Bhiwandi Bridge	54	71	68	Thane	Kalyan	Kalyan
GW	205	Dug well opp. KAMA office, MIDC Ph-I, Dombivali	Dry	Dry	Dry	Kalyan	Dombivali	MIDC,Dombivali
	206	Dug well near Mamta Hospital, Milap Nagar, Dombivali	Dry	Dry	Dry	Kalyan	Dombivali	MIDC,Dombivali
	207	Dug well at pimpleshwar Temple, MIDC Ph-II, Dombivali	Dry	Dry	Dry	Kalyan	Dombivali	MIDC,Dombivali
	208	Dug well addjusent to M/S. Altra pure chem., Sr. No. 45, Hissa No. 3, MIDC Ph-II, Dombivali.	Dry	Dry	Dry	Kalyan	Dombivali	MIDC,Dombivali

Surface Water		Good to Excellent	Medium to Good	Bad	Bad to Very Bad	Dry	Not collected	No Data
Ground Water	Excellent	Good	Poor	Very Poor	Not suitable for drinking	Dry	Not collected	No Data

RO – Kolhapur

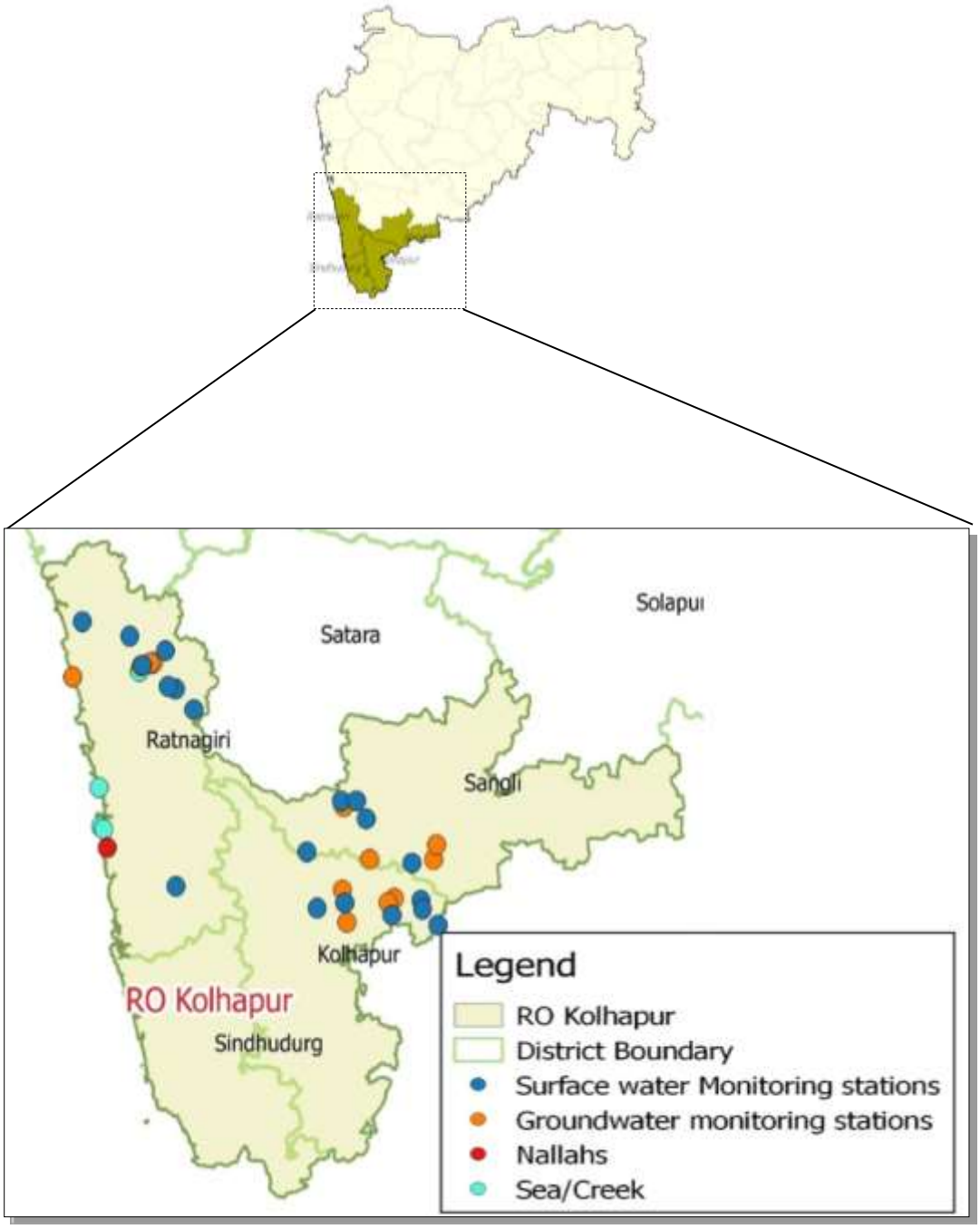

Solapur
Satara
Ratnagiri
Sangli
Kolhapur
RO Kolhapur
Sindhudurg
Legend
RO Kolhapur
District Boundary
Surface water Monitoring stations
Groundwater monitoring stations
Nallahs
Sea/Creek

Table No. 38: Water quality Index for surface and ground water monitoring at Kolhapur-RO – 2019-20

Type	Station Code	Station Name	Apr	Dec/ Oct	Average	District	Taluka	Village
SW	37	Krishna River at Maighat, Sangli	90	82	84	Sangli	Miraj	Gawali gally
	198	Bahe KT Weir, Bahe, Taluka - Walwa, District - Sangli	86	82	84	Sangli	Walwa	Bahe
	199	Borgaon KT Weir, Borgaon, Taluka - Walwa, District - Sangli	87	82	85	Sangli	Walwa	Borgaon
	200	Mangle Bridge, Mangle, Taluka - Shirala, District - Sangli	86	83	84	Sangli	Shirala	Mangle
	201	Sonpatra River At Kotwali Village, Taluka - Khed, District - Ratnagiri	87	77	82	Ratnagiri	Khed	Kotwali
	202	Vashisti River At Khadpoli, Taluka Chiplun, District - Ratnagiri	87	90	88	Ratnagiri	Chiplun	Khadpoli
	203	Jagbudi River, D/S of Khed City, Taluka - Khed, District Ratnagiri	80	88	87	Ratnagiri	Khed	Khed City
	204	Jog river at Dapoli, Taluka Dapoli, District - Rantnagiri	87	86	87	Ratnagiri	Dapoli	Dapoli
	1153	Krishna River at Rajapur Weir	85	82	83	Kolhapur	Shirol	Rajapur
	1310	Krishna River at Kurundwad	77	81	84	Kolhapur	Shirol	Narshingwadi, Kurundwad
	1311	Panchganga River at Ichalkaranji near MIDC intake well	88	82	85	Kolhapur	Hatkanangale	Shiradhwad (Ichalkaranji ghat)
	1904	Panchganga River at U/s of Kolhapur town near Balinga Pumping Station	91	83	85	Kolhapur	Karvir	Balinga
	1905	Panchaganga river at D/s of Kolhapur town at Gandhi nagar near NH-4 bridge and MIDC intake well	87	83	85	Kolhapur	Kolhapur	Uchegaon
	1906	Krishna river at Walwa, D/s of Islampur near Vithal Temple	85	83	84	Sangli	Walwa	Walwa
	2163	Panchganga River at Shirol near Shirol intake well	82	83	85	Kolhapur	Shirol	Shirol
	2164	Vashishti River at U/s of Three M Paper Mills near M/s Multifilms Plastic Pvt Ltd	87	85	88	Ratnagiri	Chiplun	Kherdi
	2676	Muchkundi River at Waked Ratnagiri near M/s Asahi India Glass	82	88	86	Ratnagiri	Lanja	Waked
	2713	Vashishti River at D/s of Three M Paper Mills near Chiplun water intake Jackwell	84	86	87	Ratnagiri	Chiplun	Kherdi
	2714	Vashishti River at U/s of Pophali near Konphansawane Bridge	87	91	88	Ratnagiri	Chiplun	Pophali
Nalla	2790	Pimpal-Paneri Nalla at Ratnagiri near Finolex Industries	87	88	83	Ratnagiri	Ratnagiri	Yahganigaon
Saline	2804	Karambavane Creek at Chiplun	88	87	87	Ratnagiri	Chiplun	Karambavane
	2813	Sea Water at Ganapatipule	73	79	80	Ratnagiri	Ratnagiri	Ganapatipule

Type	Station Code	Station Name	Apr	Dec/ Oct	Average	District	Taluka	Village
	2814	Sea Water at Bhagwati Bunder, Ratnagiri near Ultra Tech Cement Jetty	81	77	80	Ratnagiri	Ratnagiri	Mirkarwada
	2815	Madvi Sea Water at Ratnagiri near Jodhale Maruti Temple	69	77	78	Ratnagiri	Ratnagiri	Madvigaon
GW	219	Commen well Water At Patwardhan, Lote, Taluka - Khed, District - Rantnagiri	35	Dry	17	Ratnagiri	Khed	Lote
	220	Dugwell backside Excel India At Chalkewadi, Taluka - Khed, District - Ratnagiri.	29	Dry	15	Ratnagiri	Khed	Chalkewadi
	2004	Bore well at Parvati Industrial Estate, Yadrav, Kolhapur	362	262	312	Kolhapur	Shirol	Yadrav
	2005	Bore well at Khanjirenagar, Kolhapur	134	127	130	Kolhapur	Hatkanangale	Khanjirenagar
	2006	Bore well at Shinoli near M/s Aqua Alloy Steel.	51	75	63	Kolhapur	Chandgad	Shinoli
	2007	Bore well at Savali, near Gram Panchayat office.	271	86	178	Sangli	Miraj	Savali
	2008	Dug well at Sambarwadi, owned by Shri. Kishan Hali Rajput.	262	85	173	Sangli	Miraj	Sambarwadi
	2202	Dug Well at Ghane Kunt, near Awashi, onwed by shri Rajendra Amre	58	20	39	Ratnagiri	Khed	Ghane Kunt
	2829	Bore Well at MIDC Shiroli near M/s. Pratibha Enterprises	61	54	57	Kolhapur	Hatkanangale	Shiroli
	2830	Bore Well at MIDC Gokul Shirgaon	62	65	63	Kolhapur	Karvir	Gokul-Shirgaon
	2831	Dug Well at Sakharali near MIDC Islampur near Krishna Milk Industry	No Data	94	47	Sangli	Walwa	Sakharali
	2832	Dug Well No.1 at Brahmanwadi-Anjanwel, owned by Shri Vaidya	50	20	35	Ratnagiri	Guhagar	Anjanwel
	2833	Dug Well No.1 at Group Gram Panchayat at Arketwadi, near Masjid	47	23	35	Ratnagiri	Khed	Arketwadi
	2834	Dug Well No.2 at Arketwadi	1338	31	684	Ratnagiri	Khed	Arketwadi
	2835	Dug Well No.2 at owned by Group Gram Panchayat, Brahmanwadi-Anjanwel	25	21	23	Ratnagiri	Guhagar	Anjanwel

Surface Water		Good to Excellent	Medium to Good	Bad	Bad to Very Bad	Dry	Not collected	No Data
Ground Water	Excellent	Good	Poor	Very Poor	Not suitable for drinking	Dry	Not collected	No Data

RO – Mumbai

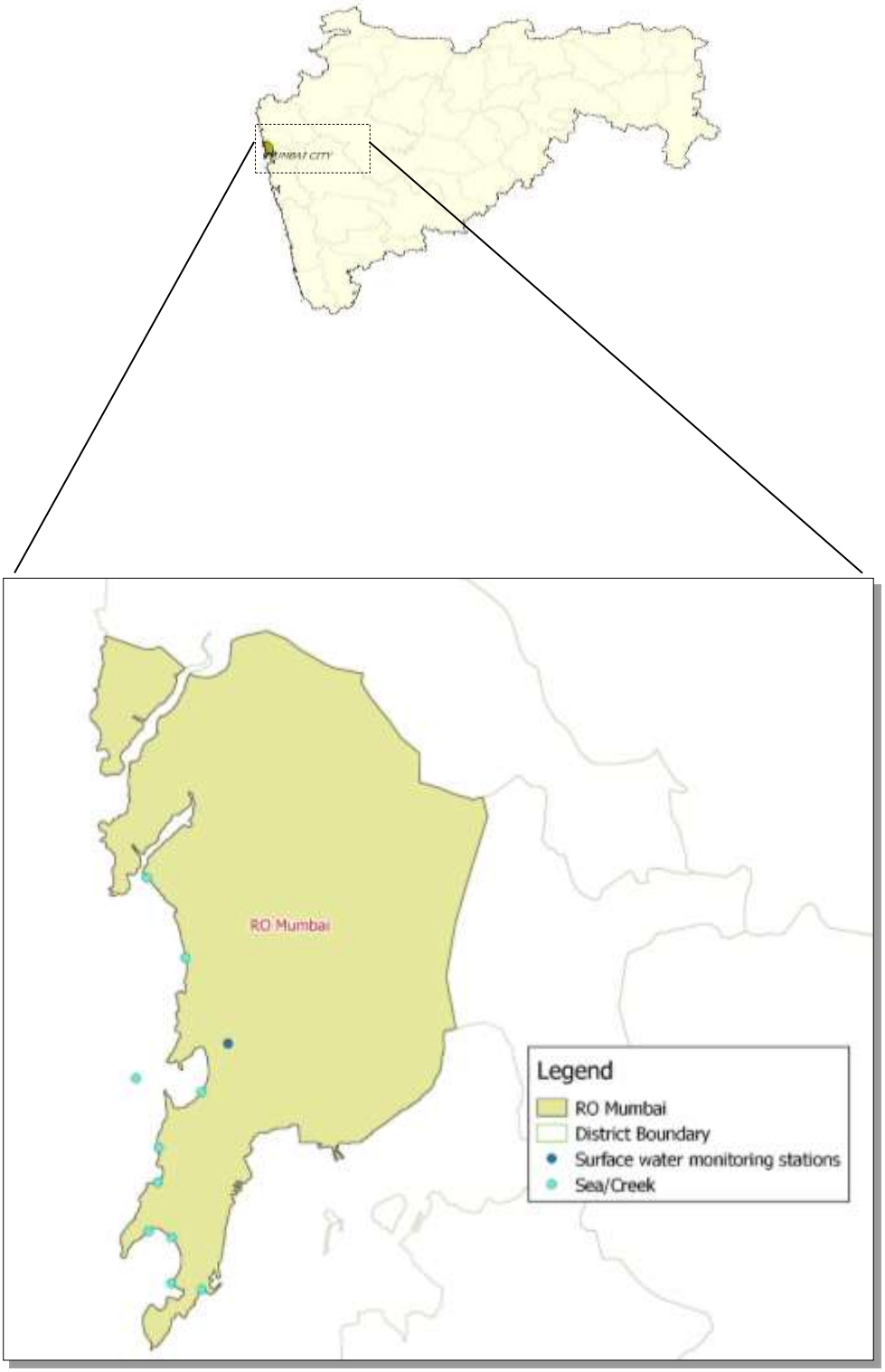

RO Mumbai
Legend
RO Mumbai
District Boundary
Surface water monitoring stations
Sea/Creek

Table No. 39: Water quality Index for surface and ground water monitoring at Mumbai-RO – 2019-20

Type	Station Code	Station Name	Apr	Dec/Oct	Average	District	Taluka	Village
SW	2168	Mithi River at near bridge	22	47	42	Mumbai	Bandra	Mahim
Saline	1318	Mahim creek at Mahim Bay	56	72	53	Mumbai	Bandra	Mahim
	2165	Sea Water at Gateway of India	45	57	53	Mumbai	Colaba	Colaba
	2166	Sea Water at Charni Road Choupathy	45	56	54	Mumbai	Mumbai	Girgaon
	2167	Sea Water at Worli Seaface	50	55	55	Mumbai	Worli	Worli
	2169	Sea Water at Varsova Beach	49	57	54	Mumbai	Andheri	Versova
	2808	Sea Water at Nariman Point	49	54	54	Mumbai	Colaba	Colaba
	2809	Sea Water at Malabar Hill	46	56	55	Mumbai	Mumbai	Walkeshwar
	2810	Sea Water at Haj Ali	46	54	53	Mumbai	Worli	Worli
	2811	Sea Water at Shivaji Park (Dadar Choupathy)	51	63	54	Mumbai	Dadar	Dadar
	2812	Sea Water at Juhu Beach	49	63	55	Mumbai	Santacruz	Juhugaon

Surface Water		Good to Excellent	Medium to Good	Bad	Bad to Very Bad	Dry	Not collected	No Data
Ground Water	Excellent	Good	Poor	Very Poor	Not suitable for drinking	Dry	Not collected	No Data

RO – Nagpur

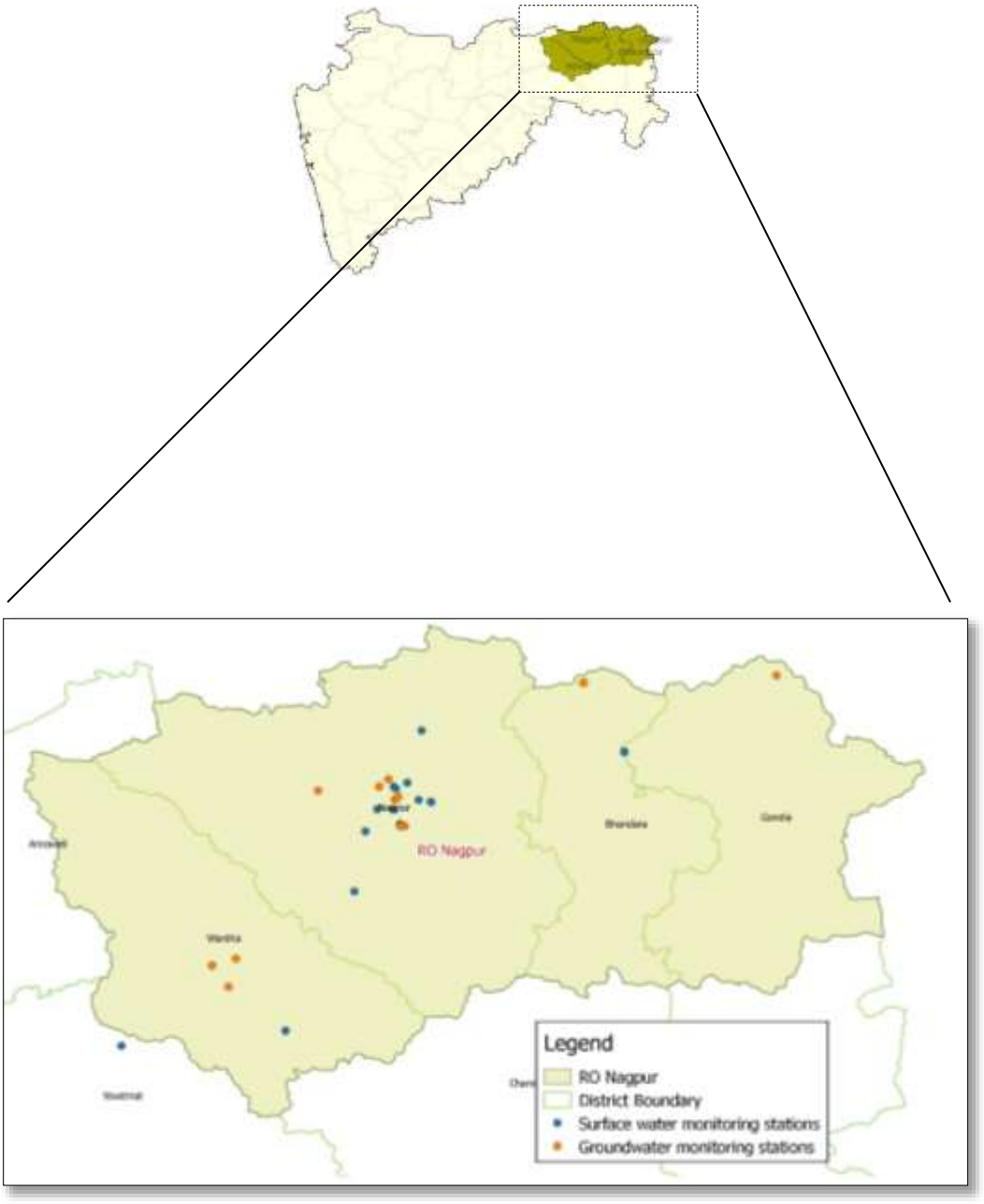

RO Nagpur
Bhandara
Gondia
Wardha
Yavatmal
Legend
RO Nagpur
District Boundary
Surface water monitoring stations
Groundwater monitoring stations

Table No. 40: Water quality Index for surface and ground water monitoring at Nagpur-RO – 2019-20

Type	Station Code	Station Name	Apr	Dec/ Oct	Average	District	Taluka	Village
SW	185	Nag River Near, Ambazari Lake, Nagpur	63	72	71	Nagpur	Nagpur	Nagpur
	186	Nag River Near, Bhandewadi Bridge, Nagpur	35	42	37	Nagpur	Nagpur	Nagpur
	187	Nag River Near, Asoli Bridge, Bhandara Road, Nagpur	35	56	38	Nagpur	Nagpur	Nagpur
	188	Pill River Near, Wanjra Layout Kamptee Road, Nagpur	36	63	43	Nagpur	Nagpur	Nagpur
	189	Pill River Near, Mankapur on Koradi Road, Nagpur	37	70	47	Nagpur	Nagpur	Nagpur
	1315	Wardha River at Pulgaon Railway Bridge	Dry	75	72	Wardha	wardha	Pulgaon
	1908	Kolar river before confluence with Kanhan river at Waregaon Bridge	61	71	70	Nagpur	Kamptee	Waregaon
	1909	Kanhan river at D/s of Nagpur	Dry	74	69	Nagpur	Kuhi	Agargaon
	1910	Wainganga river after confluence with Kanhan river	63	78	72	Nagpur	Kuhi	Ambhora
	2170	Kanhan River (Wainganga basin) at U/s of M/s Vidharba Paper Mill	58	74	71	Nagpur	Parseoni	Sinora
	2171	Kanhan River (Wainganga basin) at D/s of M/s Vidharbha Paper Mills	77	71	71	Nagpur	Parseoni	Sinora
	2172	Wainganga River at D/s of Ellora Paper Mill	67	74	73	Bandara	Tumsar	Tumsar
	2173	Wainganga River at U/s of Ellora Paper Mills	78	75	75	Bandara	Tumsar	Tumsar
	2722	Wena River at U/s of Mohata Mills, nearby Brigde on Hinganghat Wadner Road	Dry	71	72	Wardha	Hingang hat	Hinganghat
	2723	Wena River at D/s of Mohata Mills, near Bridge on Hinganghat-Wadner Road	Dry	71	71	Wardha	Hingang hat	Hinganghat
	211	Grampanchayat Suradevi Intake well On Kolar River At Suradevi, Taluka - Kamptee, District -Nagpur	96	96	96	Nagpur	Kamptee	Suradevi
GW	209	Bore well near Pardhi House, Bhandewadi, Nagpur	Dry	109	54	Nagpur	Nagpur	Bhandewadi
	210	Bore well near Dearao Kale House, Bhandewadi, Nagpur	Dry	Dry	Dry	Nagpur	Nagpur	Bhandewadi
	212	Grampanchayat Mhasala, Dugwell On Nalla At Mhasala, Taluka - Kamptee, District - Nagpur	104	Dry	52	Nagpur	Kamptee	Mhasala
	213	Grampanchayat Kawtha, Dugwell At Kawtha, Taluka - Kamptee, District - Nagpur	114	Dry	57	Nagpur	Kamptee	Kawtha
	1995	Gram Panchayath Dug well , Near Balaji Gajbhiye House, Khaperkheda	118	No Data	59	Nagpur	Saoner	Khaperkheda(Ward No.4)

Type	Station Code	Station Name	Apr	Dec/ Oct	Average	District	Taluka	Village
	1996	Gram Panchayath Dug well , Near Jagadamba G M S Mandir Sahakari Sanstha	101	No Data	51	Nagpur	Kamptee	Koradi
	1997	Bore well near Primary Health Centre, Raipur(Hingna)	84	No Data	42	Nagpur	Hingna	Raipur
	1998	Gram Panchayat Dug well near Gram Panchayat Office, Brahmni	116	No Data	58	Nagpur	Kalmesh war	Brahmni
	1999	Bore well Near Gram Panchayat, Changera.	73	No Data	37	Gondia	Gondia	Changera
	2000	Dug well near Sarode Kirana Store, Bhandewadi, Nagpur	No Data	No Data	No Data	Nagpur	Nagpur	Bhandewadi
	2203	Hand Pump in the premises of Z.P.Primary School	Dry	74	37	Wardha	wardha	Bhugaon
	2826	Dug Well near Railway Station, Cottaon Market	102	77	90	Wardha	wardha	Wardha
	2827	Bore Well near Railway crossing at Dongi Buzurg	No Data	No Data	No Data	Bandara	Tumsar	Dongri-Buzurg

Surface Water		Good to Excellent	Medium to Good	Bad	Bad to Very Bad	Dry	Not collected	No Data
Ground Water	Excellent	Good	Poor	Very Poor	Not suitable for drinking	Dry	Not collected	No Data

RO – Nashik

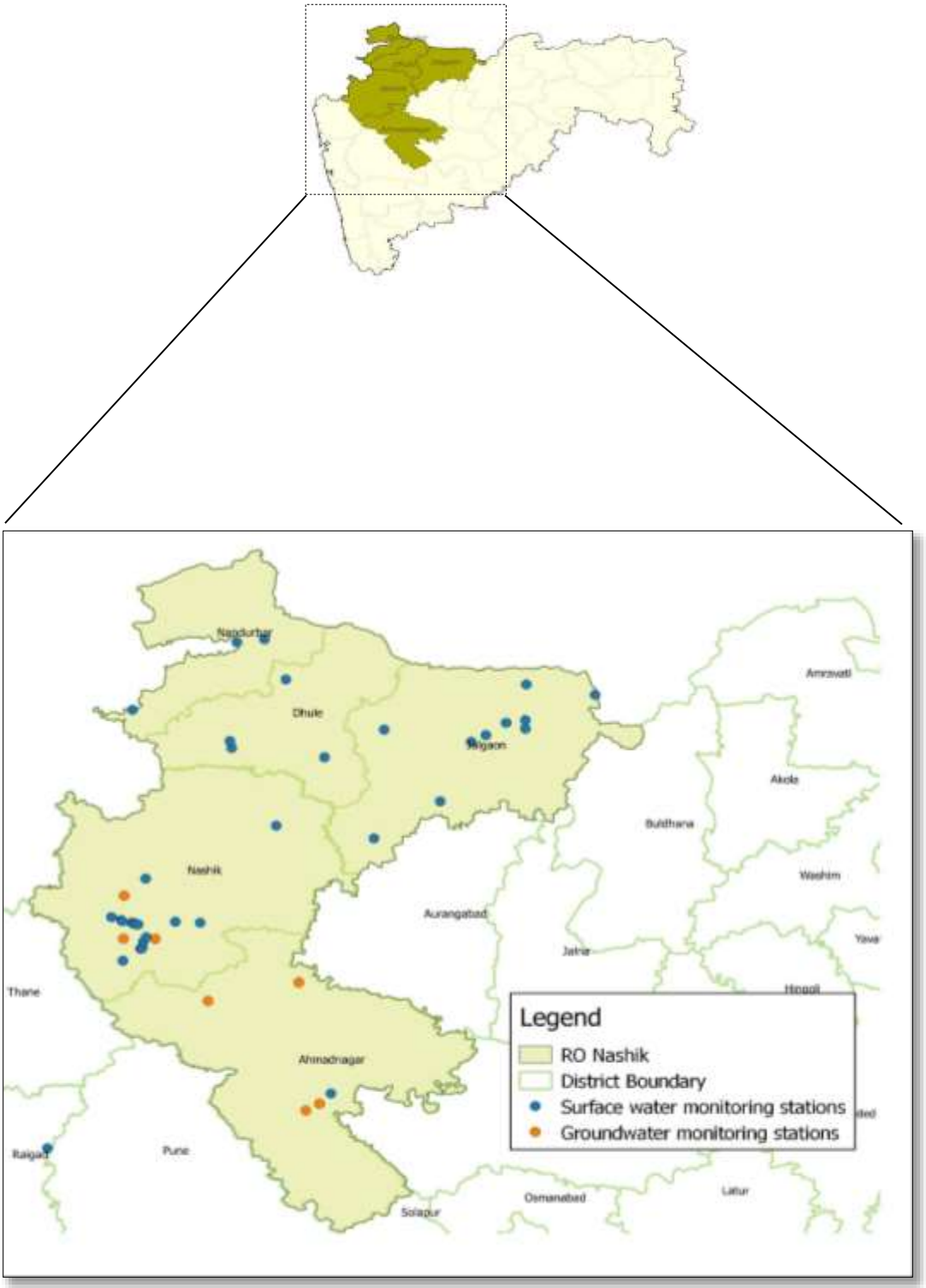

Nandurbar
Dhule
Jalgaon
Amravati
Akola
Buldhana
Washim
Nashik
Aurangabad
Jalna
Yava
Hingoli
Thane
Ahmednagar
Raigad
Pune
Osmanabad
Latur
Solapur
Legend
RO Nashik
District Boundary
Surface water monitoring stations
Groundwater monitoring stations

Table No. 41: Water quality Index for surface and ground water monitoring at Nashik -RO – 2019-20

Type	Station Code	Station Name	Apr	Dec/Oct	Average	District	Taluka	Village
SW	194	Kadwa River at Awankhed Village, Taluka - Dindori, District - Nashik	Dry	Dry	Dry	Nashik	Dindori	Awankhed Village
	195	Sina River Bridge At Burudgaon Road, A/P Ahmednagar, Taluka & District Ahmednagar	80	18	29	Ahmednagar	Ahmednagar	Burudgaon
	1095	Godavari River at U/s of Gangapur Dam	64	65	69	Nashik	Nashik	Gangapur
	1096	Godavari River at Panchavati at Ramkund	87	62	71	Nashik	Nashik	Panchavati
	1211	Godavari River at Nashik D/s of near Amardham	83	64	72	Nashik	Nashik	Gadgebaba Maharaj Nagar
	1251	Tapi River at Bhusawal	Dry	88	74	Jalgaon	Bhusawal	Bhusawal Railway Colony
	1252	Girna river at Jalgaon at intake of Girna pump house	Dry	64	67	Jalgaon	Jalgaon	Girna pump house area
	1253	Girna river at Malegaon at Malegaon road bridge	Dry	Dry	63	Nashik	Malegaon	Malegaon
	1313	Tapi River at Ajnad	59	64	70	Jalgaon	Raver	Ajnad
	1314	Tapi river at Ubad village near Gujrat border	Dry	88	76	Nandurbar	Shahada	Ubad
	1907	Rangavali river at D/s of Navapur near Rangavali bridge	Dry	62	77	Nandurbar	Navapur	Navapur
	2177	Godavari River near Someshwar Temple	61	85	74	Nashik	Nashik	Someshwar
	2179	Godavari River at Hanuman Ghat	63	65	69	Nashik	Nashik	Nashik city
	2180	Godavari River at near Tapovan	87	65	70	Nashik	Nashik	Tapovan
	2181	Godavari River at Kapila -Godavari confluence point	88	66	65	Nashik	Nashik	Tapovan
	2182	Godavari River at Saikheda	65	65	67	Nashik	Niphad	Saikheda
	2183	Godavari River at Nandur-Madhameshwar Dam	63	63	67	Nashik	Niphad	Nandur
	2652	Amravati River D/s of Dondaicha	Dry	Dry	63	Dhule	Dhule	Dondaicha
	2658	Bori River D/s of Amalner	Dry	64	67	Jalgaon	Jalgaon	Amalner
	2659	Burai River before confluece to Tapi River	Dry	Dry	71	Dhule	Dhule	Mukudas

Type	Station Code	Station Name	Apr	Dec/Oct	Average	District	Taluka	Village
	2660	Darna River at Chehedi pumping station	64	63	69	Nashik	Nashik	Chehedi
	2661	Darna River at Aswali (Darna Dam)	89	64	65	Nashik	Igatpuri	Aswali
	2662	Darna River at MES site Pumping station	90	65	71	Nashik	Nashik	Bhagur
	2663	Darna River at Bhagur Pumping station near Pandhurli Bridge	86	64	67	Nashik	Nashik	Bhagur
	2664	Darna River at Sansari	89	62	69	Nashik	Nashik	Sansari
	2666	Gomai River D/s of Shahada	Dry	Dry	77	Dhule	Dhule	Shahada
	2667	Hiwara River D/s of Pachora	Dry	64	66	Jalgaon	Jalgaon	Pachora
	2670	Kan River near Sakri water works	Dry	Dry	84	Dhule	Dhule	Sakri
	2674	Mor River near Padalshe	Dry	Dry	75	Jalgaon	Jalgaon	Padalashe
	2684	Panzara River near Panzarakan SSK Ltd	Dry	62	74	Dhule	Dhule	Panzare
	2689	Patalganga River at Gagangiri Maharaj Temple	79	79	79	Raigad	Khalapur	Khopoli
	2710	Titur River D/s of Chalisgaon	Dry	88	68	Jalgaon	Jalgaon	Chalisgaon
	2718	Waghur River at Sakegaon before Confluence with Tapi River	Dry	63	68	Jalgaon	Jalgaon	Sakegaon
Nalla	196	Lowki Nalla At Khedi, Taluka & District - Jalgaon	Dry	82	61	Jalgaon	Khedi	Khedi
	197	Moti Nalla before Confluence with Panjara river Dhule, Taluka & District - Dhule	Dry	85	61	Dhule	Dhule	Dhule
	2178	Chikhali Nalla Meets Godavari River	Dry	85	76	Nashik	Nashik	Chikhali
GW	221	Well water of Bappaji, Akolner, Ahmadnagar, Nashik	77	124	101	Nashik	Ahmadnagar	Akolner
	1990	Bore well at BMW Site , Burudgaon	Dry	No Data	No Data	Ahmadnagar	Ahmednagar	Burudgaon
	1991	Bore well at MSW Site, Pathardi, Nashik	Dry	No Data	No Data	Nashik	Nashik	Pathardi
	2204	Dug well at Gunjalwadi, Sangamner near Primary Health Care Center.	Dry	No Data	No Data	Ahmadnagar	Sangamner	Gunjalwadi
	2816	Dug Well of Mr. Sampat Walunj, near M/s. Mahajeet Clayton	Dry	No Data	No Data	Nashik	Nashik	Shinde village
	2817	Bore Well at Chitali near Wagh vasthi	Dry	No Data	No Data	Ahmadnagar	Rahata	Chitali

Type	Station Code	Station Name	Apr	Dec/Oct	Average	District	Taluka	Village
	2818	Bore Well at M/s. Spectron Ethers Rasegaon near Siddeshwar Mahadev Mandir	Dry	No Data	No Data	Nashik	Dindori	Rasegaon

Surface Water		Good to Excellent	Medium to Good	Bad	Bad to Very Bad	Dry	Not collected	No Data
Ground Water	Excellent	Good	Poor	Very Poor	Not suitable for drinking	Dry	Not collected	No Data

RO – Navi Mumbai

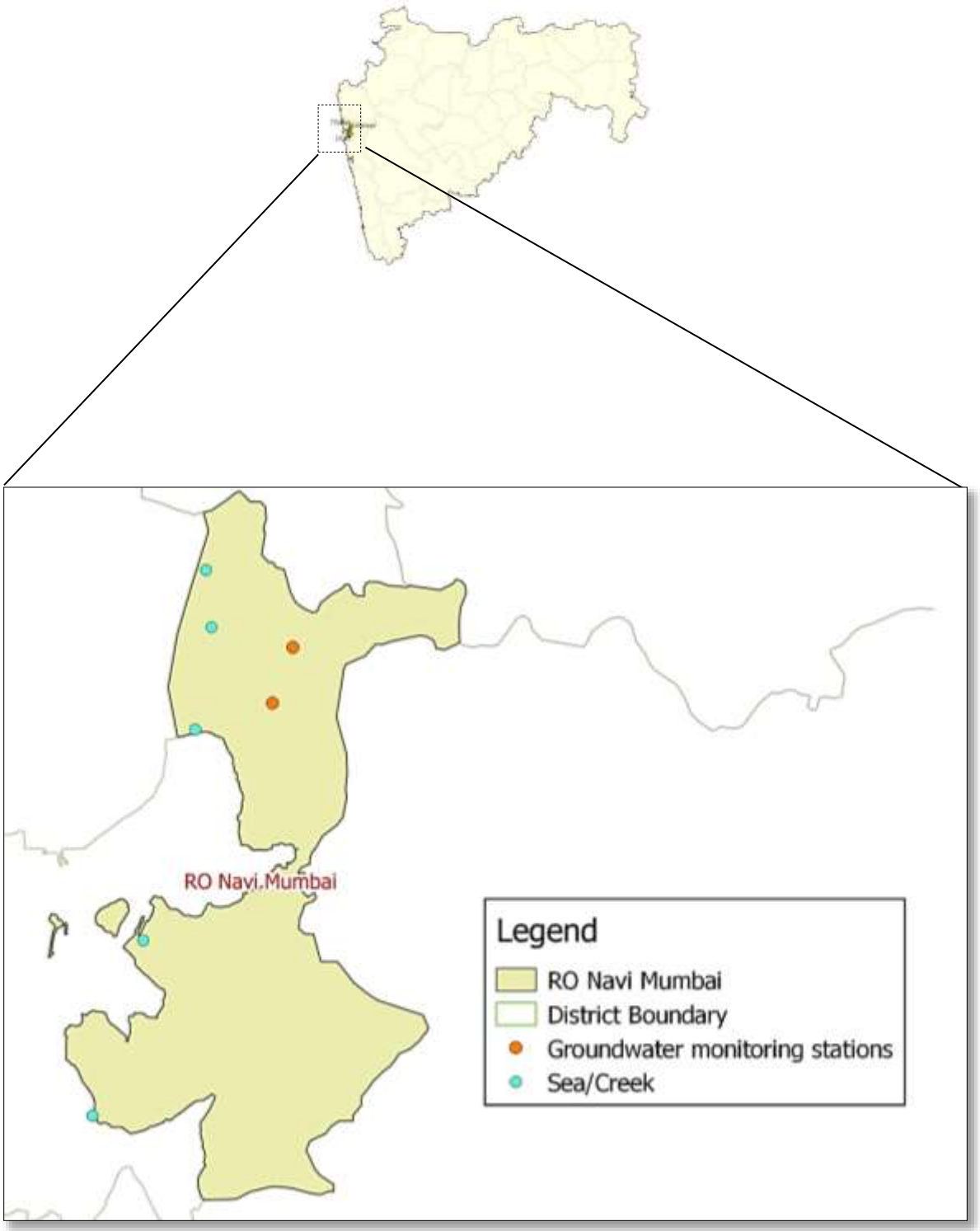


Table No. 42: Water quality Index for surface and ground water monitoring at Navi Mumbai-RO – 2019-20

Type	Station Code	Station Name	Apr	Dec/Oct	Average	District	Taluka	Village
SW	216	Kasardi River near Ganesh Ghat	35	75	72	Raigad	Panvel	Taloja
Saline	190	TTC Creek At Ghansoli Jetty	60	63	62	Thane	Thane	Ghansoli
	191	Arabian Sea behind ONGC Uran	51	50	56	Raigad	Uran	Uran
	1317	Thane creek at Elephanta Island	57	57	57	Raigad	Uran	Gharapuri, Elephanta Island
	2184	Vashi Creek at Airoli Bridge	58	70	61	Thane	Thane	Airoli
	2185	Vashi Creek at Vashi Bridge	60	59	63	Thane	Thane	Vashi
GW	214	Borewell at TTCWMA, Mahape	Dry	Dry	Dry	Thane	Thane	TTCWMA,Mahape
	215	Well water at Turbhe Store, Turbhe	117	92	105	Thane	Thane	Turbhe

Surface Water		Good to Excellent	Medium to Good	Bad	Bad to Very Bad	Dry	Not collected	No Data
Ground Water	Excellent	Good	Poor	Very Poor	Not suitable for drinking	Dry	Not collected	No Data

RO – Pune

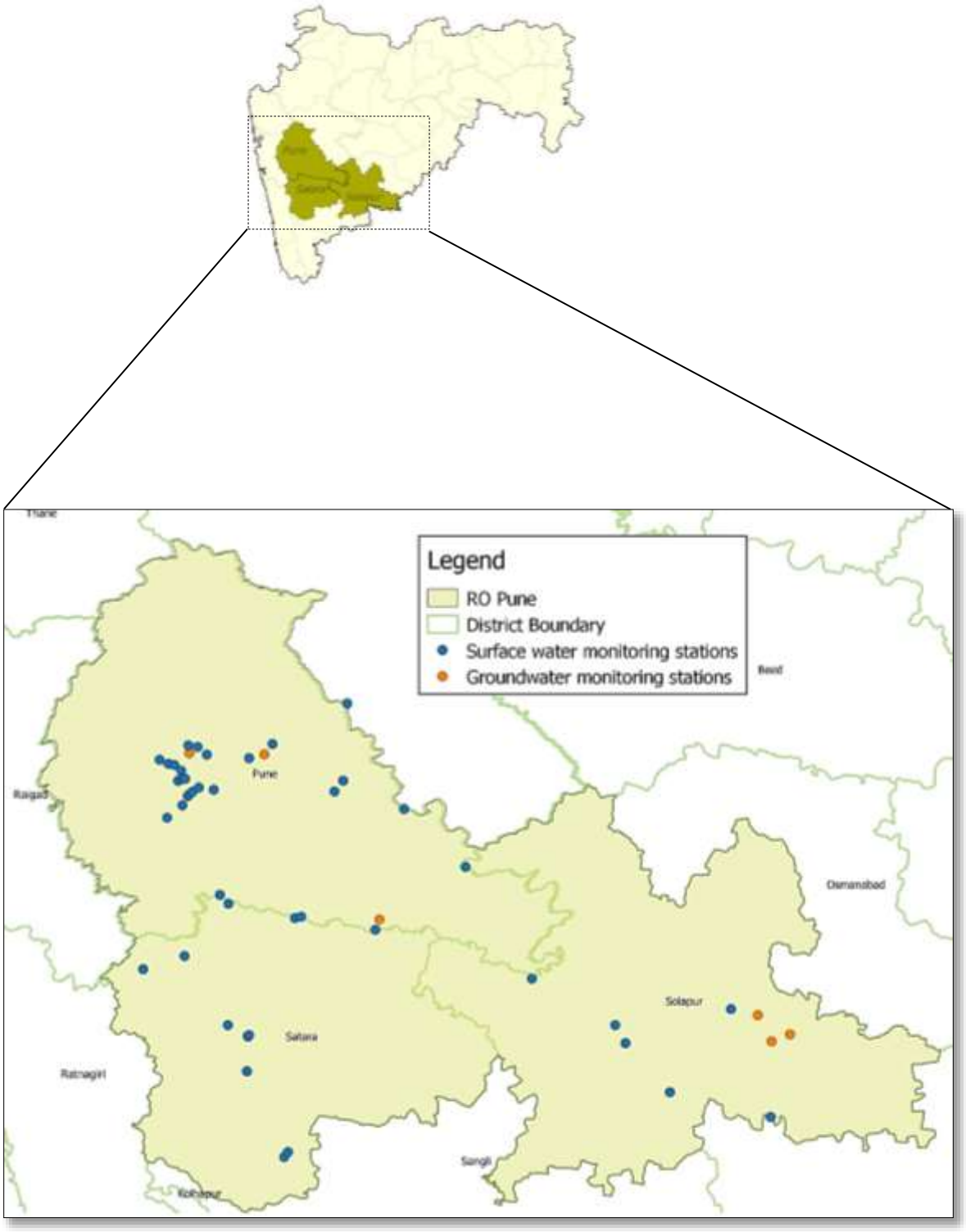

Legend
RO Pune
District Boundary
Surface water monitoring stations
Groundwater monitoring stations
Pune
Satara
Solapur
Ratnagiri
Sangli
Osmanabad

Table No. 43: Water quality Index for surface and ground water monitoring at Pune-RO – 2019-20

Type	Station Code	Station Name	Apr	Dec/ Oct	Average	District	Taluka	Village
SW	28	Bhima River at Takli	50	70	65	Solapur	South Solapur	Takali
	36	Krishna River at Krishna Bridge, Karad	63	72	69	Satara	Karad	Karad
	1188	Bhima River at Narshingpur near Sangam Bridge after confluence with Nira	47	64	68	Solapur	Malshiros	Narsingpur
	1189	Bhima river at Pune(Mutha river) at U/s of Vithalwadi near Sankar Mandir	56	31	52	Pune	Haweli	Vithalwadi
	1190	Bhima river at D/s of Bundgarden, Pune	32	46	49	Pune	Haweli	Yerwada
	1191	Bhima river after confluence with Mula-Mutha at Pargaon near Vasant Bandara	54	63	67	Pune	Daund	Pargaon
	1192	Bhima river at Daund near Mahadev temple	50	65	63	Pune	Daund	Daund
	1194	Krishna river at Dhom Dam	86	83	83	Satara	Mahabaleshwar	Wai
	1463	Nira river at Sarola bridge	64	69	70	Pune	Bhor	Sarola
	1911	Chandrabhaga river at U/s of Pandharpur town	53	60	60	Solapur	Pandarpur	Gursale
	1912	Chandrabhaga river at D/s of Pandharpur town near Vishnupant Mandir	49	58	59	Solapur	Pandarpur	Gopalpur
	2186	Venna River at Varya, Satara	77	81	80	Satara	Satara	Varye
	2187	Krishna River at Kshetra Mahuli Satara	56	73	66	Satara	Mahuli	Kshetra Mahuli
	2188	Krishna River at Krishna-Venna Sangam, Mahuli	56	73	68	Satara	Mahuli	Mahuli
	2189	Koyna River at Karad	66	74	69	Satara	Karad	Karad
	2190	Krishna River at Wai	57	76	68	Satara	Wai	Wai
	2191	Mutha River at Sangam Bridge Near Ganpathi Ghat	32	30	47	Pune	Pune	Shivaji Nagar
	2192	Mula-Mutha River at Mundhwa Bridge	35	44	50	Pune	Haweli	Mundhawa
	2193	Mula River at Aundh Bridge -Aundgaon	37	50	55	Pune	Haweli	Aundhgaon
	2194	Mula River at Harrison Bridge near Mula -Pawana Sangam	32	39	49	Pune	Haweli	Bopodi
	2195	Nira River at D/s of Jubilant Organosis Pune	Dry	62	58	Pune	Baramati	Nimbut
	2196	Pawana River at Sangavigaon, Pune	39	45	53	Pune	Haweli	Sangavigaon

Type	Station Code	Station Name	Apr	Dec/ Oct	Average	District	Taluka	Village
	2197	Indrayani River at D/s of Alandigaon, Pune	52	58	58	Pune	Haweli	Alandigaon
	2655	Bhima River at Koregaon near Koregaon Bridge, Pune	50	52	61	Pune	Shirur	Koregaon
	2656	Bhima River Backwater of Ujani Dam near raw water pump house	74	68	73	Pune	Indapur	Kumbargaon
	2665	Ghod River at Shirur, Pune	Dry	65	67	Pune	Shirur	Shirur
	2668	Indrayani River at D/s of Moshi village	Dry	59	64	Pune	Haveli	Moshi
	2669	Indrayani River at U/s of Moshigaon, Pune	Dry	62	67	Pune	Haweli	Moshigaon
	2677	Mula-Mutha River at D/s of Theur, Pune	48	61	61	Pune	Haweli	Theur
	2678	Mutha River near Veer Savarkar Bhavan	31	42	49	Pune	Pune	Pune M.C
	2679	Mutha River at Deccan Bridge, Pune	27	30	43	Pune	Pune	Deccan
	2680	Mutha River at Khadakvasla Dam Pune	89	84	86	Pune	Haweli	Kadakvasla
	2681	Nira River at Sangavi	56	71	64	Satara	Phaltan	Sangavi
	2682	Nira River at U/s of Jubilant Organosis Pune	60	67	62	Pune	Baramati	Nira(Datta ghat)
	2683	Nira River at Shindewadi	66	73	71	Satara	Khandala	Shindewadi, Shirwal
	2690	Pawana River at Kasarwadi Pune	33	48	46	Pune	Haweli	Kasarwadi
	2691	Pawana River at Dapodi Bridge at Pawana-Mulla Sangan Pune	27	48	48	Pune	Haweli	Dapodi
	2692	Pawana River at Ravet Weir, Pune	78	76	79	Pune	Haweli	Ravet
	2693	Pawana River at Chinchwadgaon, Pune	38	59	53	Pune	Haweli	Chinchwadgaon
	2694	Pawana River at Pimprigaon, Pune	38	48	49	Pune	Haweli	Pimprigaon
	2705	Sina River near Laboti till naka Solapur	52	66	69	Solapur	Mohal	Laboti
	2711	Urmodi River at Nagthane Satara	69	75	73	Satara	Satara	Nagthane
	2715	Vel River at Shikrapur, Pune	Dry	74	67	Pune	Shirur	Shikrapur
	2716	Venna River at Mahabaleshwar	75	81	78	Satara	Mahabaleshwar	Mahabaleshwar
	2717	Venna River at Mahuli	62	75	70	Satara	Satara	Mahuli
Nalla	2789	Nalla at D/s of Alkai Mandir, Solapur	Dry	65	68	Solapur	Malshiras	Aklai

Type	Station Code	Station Name	Apr	Dec/ Oct	Average	District	Taluka	Village
GW	1992	Dug well at MSW Site, owned by Shri.Dattu Kondiba Borate at Borate Vasthi.	72	66	69	Pune	Haveli	Moshi
	2819	Dug Well Owned by Shri Deshmukh	250	385	318	Pune	Baramati	Malegaon
	2820	Dug Well Owned by Shri Shivaji Baban Darekar	32	151	92	Pune	Shirur	Sanaswadi
	2821	Bore Well at Bale Railway Station premises Owned by Shri Digambar Joshi	No Data	410	205	Solapur	North Solapur	Dahegaon
	2822	Bore Well near Chincholi	No Data	352	176	Solapur	Mohol	Chincholi
	2823	Bore Well at Shete Vasti near old Tuljapur Road	No Data	447	223	Solapur	Solapur	Shete vasthi, Tuljapur Naka

Surface Water		Good to Excellent	Medium to Good	Bad	Bad to Very Bad	Dry	Not collected	No Data
Ground Water	Excellent	Good	Poor	Very Poor	Not suitable for drinking	Dry	Not collected	No Data

RO – Raigad

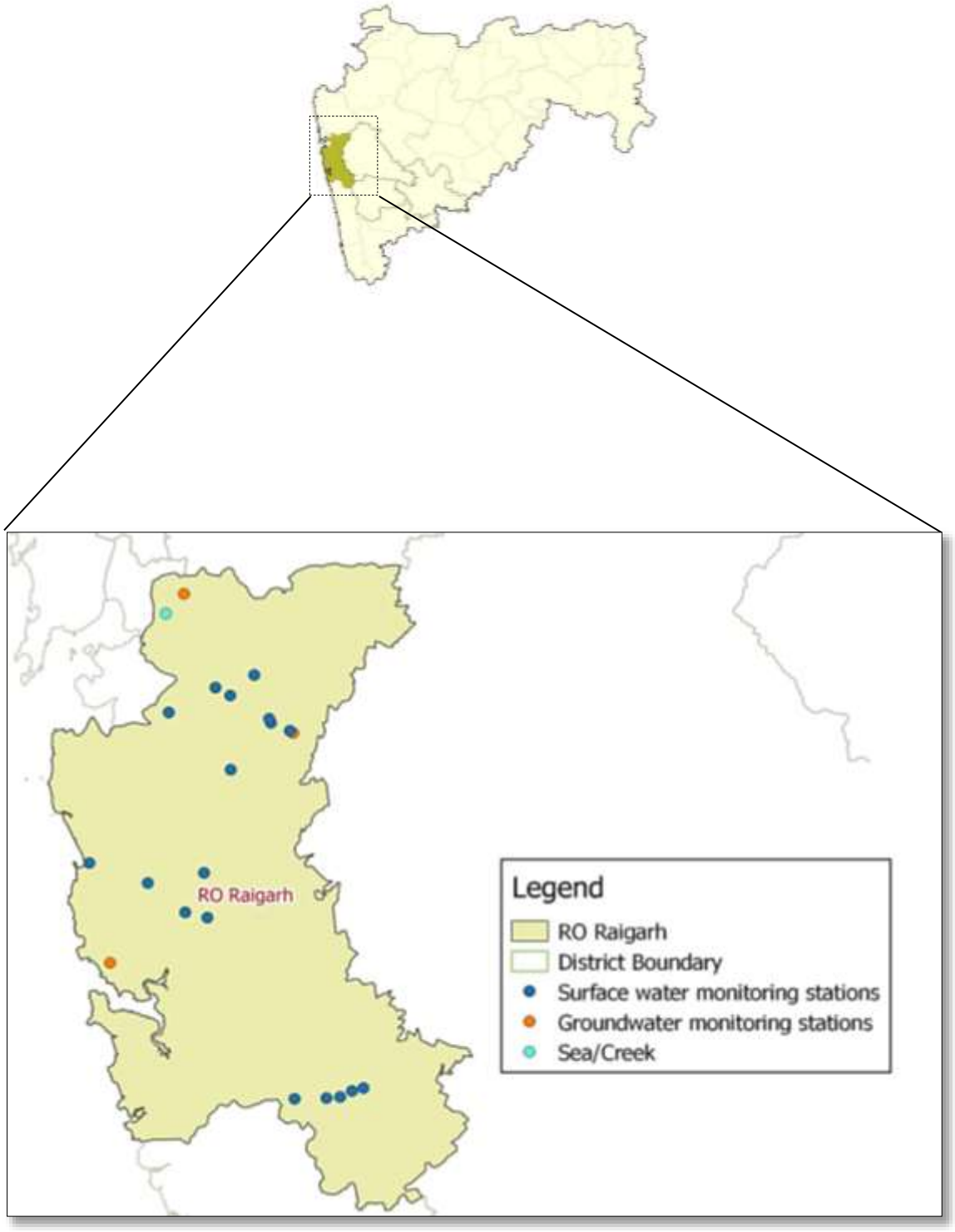

RO Raigarh
Legend
RO Raigarh
District Boundary
Surface water monitoring stations
Groundwater monitoring stations
Sea/Creek

Table No. 44: Water quality Index for surface and ground water monitoring at Raigad RO – 2019-20

Type	Station Code	Station Name	Apr	Dec/ Oct	Average	District	Taluka	Village
SW	192	Morbe Dam, Taluka - Khalapur, District - Raigad	Dry	83	80	Raigad	Khalapur	Khalapur
SW	193	Balganga River, Village Ransai, Taluka - Khalapur, District - Raigad	Dry	81	82	Raigad	Khalapur	Ransai
SW	1151	Patalganga River at Shilphata Bridge	77	79	80	Raigad	Khalapur	Khopoli
SW	1152	Kundalika River at Roha Bridge	78	82	80	Raigad	Roha	Roha
SW	1462	Patalganga near intake of MIDC water works(Turade w/w)	76	73	77	Raigad	Khalapur	Turade
SW	2198	Kundalika River at Are Khurd (Saline Zone)	69	74	77	Raigad	Roha	Are Khurd
SW	2199	Savitri River at Ovale village	87	84	81	Raigad	Mahad	Ovale
SW	2651	Amba River at D/s of Waken Bridge	80	83	78	Raigad	Roha	Waken Phata
SW	2671	Kundalik River near Salav Bridge (Saline Zone)	59	77	64	Raigad	Roha	Salav
SW	2672	Kundalika River at Dhatav at Jackwell	83	76	80	Raigad	Roha	Dhatav
SW	2685	Patalganga River at D/s of Kharpada Bridge	78	82	80	Raigad	Khalapur	Kharpada
SW	2686	Patalganga River at Vyal pump house	80	76	78	Raigad	Khalapur	Vyal
SW	2687	Patalganga River at Khalapur pumping house	80	77	79	Raigad	Khalapur	Khalapur
SW	2688	Patalganga River at Savroli Bridge	77	70	80	Raigad	Khalapur	Savroli
SW	2701	Savitri River Jackwell at Upsa kendra	89	87	82	Raigad	Mahad	Nangalwadi
SW	2702	Savitri River at Shedav Doh	87	87	83	Raigad	Mahad	Shedav Dov
SW	2703	Savitri River at Dadli Bridge	89	85	82	Raigad	Mahad	Dadli
SW	2704	Savitri River at Muthavali village	88	85	82	Raigad	Mahad	Muthavali
Saline	2803	Panvel Creek at Kopra Bridge	65	67	76	Raigad	Panvel	Kopra
GW	217	Borewell water at village Milgaon, Taluka - Khalapur, District - Raigad.	Dry	40	20	Raigad	Khalapur	Milgaon
GW	218	Borewell water near MSW site, Murud - Janjira.	Dry	Dry	Dry	0	0	Murud Janjira
GW	1989	Bore well at MWML Site at Taloja	42	28	35	Raigad	Panvel	Karawla- Taloja

Surface Water		Good to Excellent	Medium to Good	Bad	Bad to Very Bad	Dry	Not collected	No Data
Ground Water	Excellent	Good	Poor	Very Poor	Not suitable for drinking	Dry	Not collected	No Data

RO – Thane

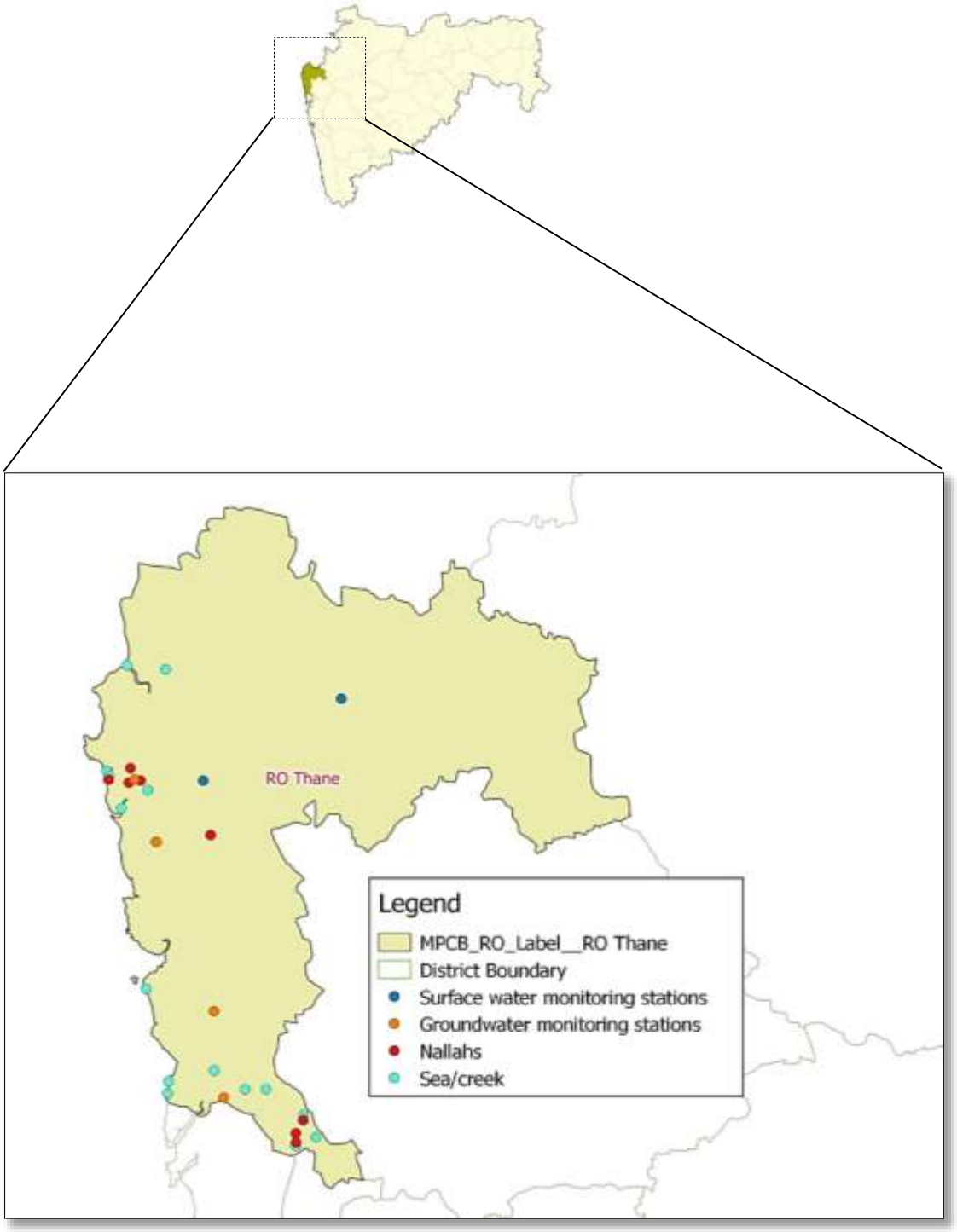

RO Thane
Legend
MPCB_RO_Label__RO Thane
District Boundary
Surface water monitoring stations
Groundwater monitoring stations
Nallahs
Sea/creek

Table No. 45: Water quality index for surface and ground water monitoring at Thane RO -2019-20

Type	Station Code	Station Name	Apr	Dec/ Oct	Average	District	Taluka	Village
SW	2696	Pelhar dam	82	85	79	Palghar	Vasai	Pelhar
	2706	Surya River U/s of Surya Dam	81	65	73	Thane	Vikramgad	Dhamni
	2707	Surya River at MIDC pumping station	79	64	73	Thane	Palghar	Garvashet
	2708	Surya River at Intake of Vasai-Virar water scheme	74	64	74	Thane	Palghar	Masvan
Saline	1316	Bassein creek at Vasai Fort, Thane	53	59	65	Thane	Vasai	Bassein
	2792	Ulhas Creek at Mumbra Reti Bunder	58	64	65	Thane	Thane	Mumbra
	2793	Thane Creek at Kalwa Road Bridge	63	66	64	Thane	Thane	Kalwa
	2794	Ulhas Creek at Kolshet Reti Bunder	60	69	65	Thane	Thane	Kolshet
	2795	Ulhas Creek at Gaimukh at Nagla Bunder on Ghod Bunder Road	60	64	66	Thane	Thane	Nagla
	2796	Ulhas Creek at Versova Bridge	51	62	66	Thane	Vasai	Versova
	2797	Bhayander Creek at D/s of Railway Bridge at Jasal Park Choupathy	57	62	66	Thane	Bhayander	Navghar
	2798	Kharekuran Murbe Creek	48	61	57	Thane	Palghar	Kharekuran
	2799	Dandi Creek	49	59	58	Thane	Palghar	Dandi
	2800	Sarwali Creek	60	72	60	Thane	Palghar	Sarwali
	2801	Savta Creek	55	69	63	Thane	Dahanu	Savta
	2802	Dahanu Creek at Dahanu Fort	53	64	63	Thane	Dahanu	Danugaon
	2805	Arnala Sea	44	58	54	Thane	Vasai	Arnala
	2806	Uttan Sea at Bhayander	52	56	55	Thane	Bhayander	Uttan
	2807	Navapur Sea	51	60	57	Thane	Palghar	Navapur
GW	1984	Bore well at M/s Tata Iron {} Steel Co. Ltd, S-76	Dry	Dry	Dry	Thane	Palghar	MIDC Tarapur, Industrial Estate, Tarapur
	1985	Dug well at 5 Star Industrial Estate	267	146	206	Thane	Mira-Bhayander	Kashimira
	1986	Bore well at Motapada	110	77	93	Thane	Dahanu	Motapada
	1987	Bore well at Vasai	167	85	126	Thane	Vasai	Gokhiware

Type	Station Code	Station Name	Apr	Dec/ Oct	Average	District	Taluka	Village
	1988	Bore well at Gharatwadi, Palghar	232	315	274	Thane	Palghar	Aliyali
Nalla	2782	Rabodi Nalla	24	52	41	Thane	Thane	Rabodi
	2783	Colour Chem Nalla	25	51	42	Thane	Thane	Majiwada
	2784	Sandoz Nalla	25	51	44	Thane	Thane	Sandozbaug
	2785	BPT Navapur	25	39	33	Palghar	Palghar	Navapur
	2786	Tarapur MIDC Nalla, near sump No1	Dry	Dry	37	Palghar	Palghar	MIDC Tarapur
	2787	Tarapur MIDC Nalla	Dry	Dry	37	Palghar	Palghar	MIDC Tarapur
	2788	Tarapur MIDC Nalla near sump-III	Dry	Dry	34	Palghar	Palghar	MIDC Tarapur

Surface Water		Good to Excellent	Medium to Good	Bad	Bad to Very Bad	Dry	Not collected	No Data
Ground Water	Excellent	Good	Poor	Very Poor	Not suitable for drinking	Dry	Not collected	No Data

Annex II – List of Pending Writ petitions

List of the Applications/Appeals pending before the Hon'ble National Green Tribunal, Principal Bench, New Delhi / Western Zone, Pune regd. river pollution, for the year 2019-2020

Sr.No.	Name of the Parties	Application /Appeal No.	Region	Subject matter
1	Sarang Yadwadkar & Ors V/s. Pune Municipal corporation & Ors	Original Application No. 49/2019	Pune	Dumping of construction material on the flood plains of the river flowing through Pune and Pimpri Chinchwad Cities
2	Dr. Kiran Ramdas Kamble & anr V/s. The State of Maharashtra & Ors	Original application no. 544/2019	Nashik	Disposal of sewage into river godavari at Trimbkeshwar
3	Rameshwar R Maniyar V/s. Union of India & Ors	Original application No. 100/2019	Pune	Waste water flows in the Indrayani river
4	Devraj Bhatia v/s Pune Municipal Corporation	Original Application No.3/2020	Pune	Concrete road construction in river area causing obstruction to flow of river water.
5	Sarang Yadwadkar & Ors.v/s Pune Municipal Corporation and Ors.	Original Application No.30/2020	Pune	Dumping of debris in Mutha river bed, area between Mhatre and Rajaram Bridge.
6	Sarang Yadwadkar & Ors. v/s Pune Municipal Corporation & Ors.	Original Application No.28/2020	Pune	Pillar construction in Pune Metro Project in the river bed, which creates increase in flood possibility in Pune region.

Source: Maharashtra Polluiton Control Board

Annex III – List of Polluted Stretches across Maharashtra

Priority wise Polluted River Stretches as per CPCB Report September 2018							
Priority I (9)	**Priority II (6)**	**Priority III (14)**		**Priority IV (10)**		**Priority V (14)**	
Godavari	Bhima	Ghod	Pedhi	Bindusar	Koyna	Amba	Savitri
Kalu	Indrayani	Kanhan	Penganga	Bori	Pehlar	Bhatsa	Surya
Kundalika	Mula-mutha	Kolar	Purna	Chandrabhaga	Sina	Gomai	Tansa
Mithi	Pawana	Krishna	Tapi	Darna	Titur	Kan	Ulhas
Morna	Wainganga	Mor	Urmodi	Girna	Hiwara	Manjeera	Vaitarna
Mula	Wardha	Patalganga	Venna			Panchganga	Vashisti
Mutha		Wena	Waghur			Panzara	Rangavali
Nira							
Vel							

Prioritywise Polluted River Stretches (April 2019 - March 2020)								
Priority I (1)	**Priority II (6)**	**Priority III (12)**		**Priority IV (12)**		**Priority V (21)**		**Less polluted (1)**
Mithi	Bhima	Chandrabhaga	Nira	Ghod	Penganga	Amba	Kalu	Panchganga
	Godavari	Indrayani	Morna	Koyna	Tapi	Bhatsa	Kan	
	Kanhan	Kundalika	Rangavali	Krishna	Vel	Bindusara	Kolar	
	Mutha	Patalganga	Sina	Manjara	Venna	Bori	Pelhar	
	Pawna	Wainganga	Mula	Mor	Wena	Darna	Purna	
	Urmodi	Mula-Mutha	Wardha	Panzara	Pedhi	Girna	Savitri	
						Gomai	Surya	
						Hiwara	Tansa	
						Ulhas	Titur	
						Vaitarna	Vashishti	
						Waghur		

Source: Maharashtra Pollution Control Board

Annex IV – Status of Sewage Treatment of Maharashtra

SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
Sr. No.	**Name of Municipal Corporation**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD)**	**% of Sewage Treatment**
1	Ahmednagar Municipal Corporation	Corporation	Ahmednagar	60	0	0.0
2	Akola Municipal Corpartion	Corporation	Akola	30	0	0.0
3	Amravati Municupal corporation	Corporation	Amravati	93	74.5	80.1
4	Aurangabad Municipal Corporation	Corporation	Aurangabad	102	94	92.2
5	Bhiwandi Municipal Corporation	Corporation	Thane	90	13	14.4
6	Chandrapur Municipal Corporation	Corporation	Chandrapur	36	36	100.0
7	Dhule Municipal Corporation	Corporation	Dhule	36	0.0	0.0
8	Jalgaoan Municipal Corporation	Corporation	Jalgaon	48	0	0.0
9	Kalyan Dombavli Municipal Corporation	Corporation	Thane	216	66	30.6
10	Kolhapur Municipal Corporation	Corporation	Kolhapur	96	90	93.8
11	Latur Municipal Corporation	Corporation	Latur	32	0	0.0
12	Malegaon Municipal Corporation	Corporation	Malegaon	50	0.0	0.0
13	Mira Bhainder Municipal corporation	Corporation	Thane	108	97.5	90.3
14	Mumbai Municipal Corporation	Corporation	Mumbai	2190	1285	58.7
15	Nagpur Municipal corporation	Corporation	Nagpur	505	345.3	68.4
16	Nanded Municipal Corporation	Corporation	Nanded	60	45	75.0

SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
Sr. No.	**Name of Municipal Corporation**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
17	Nashik Municipal Corporation	Corporation	Nashik	360.5	295	81.8
18	Navi Mumbai Municipal Corporation	Corporation	Thane	210	210	100.0
19	Panvel Municipal Corporation	Corporation	Raigad	252	147	58.3
20	Parbhani Municipal Corporation	Corporation	Parbhani	38	0	0.0
21	Pimpri Municipal Corporation	Corporation	Pune	312	280	89.7
22	Pune Municipal Corporation	Corporation	Pune	750	514	68.5
23	Sangli Municipal Corporation	Corporation	Sabgli	68	49.2	72.4
24	Solapur Municipal Corporation	Corporation	Solapur	90	62.7	69.7
25	Thane Municipal Corporation	Corporation	Thane	325	88.5	27.2
26	Ulhasnagar Municipal corporation	Corporation	Thane	67	20.7	30.9
27	Vasai Virar Municipal Corporation	Corporation	Palghar	105	30	28.6
				6329.5	3843.4	60.7
Municipal Council						
Sr. No.	**Name of Municipal Council**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
1	Kopargaon Municipal Council	B & C	Ahmednagar	7	0	0.0
2	Sangamner Municipal Council	B & C	Ahmednagar	5.5	0	0.0
3	Shrirampur Municipal Council	B & C	Ahmednagar	10	0	0.0
4	Pathardi Municipal Council	B & C	Ahmednagar	2.5	0	0.0

SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
Sr. No.	**Name of Municipal Council**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
5	Rahata Pimplas Municipal Council	B & C	Ahmednagar	2.5	0	0.0
6	Jamkhed Municipal Council	B & C	Ahmednagar	3	0	0.0
7	Devlali Pravara Municipal Council	B & C	Ahmednagar	2	0	0.0
8	Srigonda Municipal Council	B & C	Ahmednagar	2.6	0	0.0
9	Rahuri Municipal Council	B & C	Ahmednagar	2.5	0	0.0
10	Shevgaon Municipal Council	B & C	Ahmednagar	2.7	0	0.0
11	Murtizapur Municipal Council	B & C	Akola	2.4	0	0.0
12	Balapur Municipal Council	B & C	Akola	2	0	0.0
13	Akot Municipal Council	B & C	Akola	7	0	0.0
14	Patur Municipal Council	B & C	Akola	1.1	0	0.0
15	Telhara Municipal Council	B & C	Akola	1	0	0.0
16	Achalpur Municipal Council	A	Amravati	8.5	0	0.0
17	Warud Municipal Council	B & C	Amravati	2.4	0	0.0
18	Anjangaon Surji Municipal Council	B & C	Amravati	2.85	0	0.0
19	ChandurRailway Municipal Council	B & C	Amravati	1.8	0	0.0
20	Daryapur Municipal Council	B & C	Amravati	2	0	0.0
21	Shendurjana Ghat Municipal Council	B & C	Amravati	1.6	0	0.0
22	Chikhaldara Hill Station Municipal Council	B & C	Amravati	0.4	0	0.0
23	Dhamangaon Municipal Council	B & C	Amravati	1.8	0	0.0

SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
Sr. No.	**Name of Municipal Council**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
24	ChandurBazaar Municipal Council	B & C	Amravati	1.2	0	0.0
25	Morshi Municipal Council	B & C	Amravati	3.2	0	0.0
26	Paithan Municipal Council	B & C	Aurangabad	2.4	0	0.0
27	Kannada Municipal Council	B & C	Aurangabad	2.4	0	0.0
28	Vaijapur Municipal Council	B & C	Aurangabad	2.6	0	0.0
29	Sillod Municipal Council	B & C	Aurangabad	3	0	0.0
30	Gangapur Municipal Council	B & C	Aurangabad	1.5	0	0.0
31	Khuldabad Municipal Council	B & C	Aurangabad	0.9	0	0.0
32	Beed Municipal Council	A	Beed	22	0	0.0
33	Majalgaon Municipal Council	B & C	Beed	4	0	0.0
34	Ambejogai Municipal Council	B & C	Beed	9	0	0.0
35	Parli Vaijinath Municipal Council	B & C	Beed	3.75	0	0.0
36	Gevrai Municipal Council	B & C	Beed	3.6	0	0.0
37	Dharur Municipal Council	B & C	Beed	0.36	0	0.0
38	Tumsar Municipal Council	B & C	Bhandara	3.5	0	0.0
39	Bhandara Municipal Council	B & C	Bhandara	10	0	0.0
40	Pavani Municipal Council	B & C	Bhandara	1.6	0	0.0
41	Malkapur - Buldhana Municipal Council	B & C	Buldhana	2.75	0	0.0
42	Shegaon Municipal Council	B & C	Buldhana	3.5	3.5	100.0

SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
Sr. No.	**Name of Municipal Council**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
43	Chikhli Municipal Council	B & C	Buldhana	2.4	0	0.0
44	Mehkar Municipal Council	B & C	Buldhana	2	0	0.0
45	Khamgaon Municipal Council	B & C	Buldhana	4	0	0.0
46	Nandura Municipal Council	B & C	Buldhana	1.6	0	0.0
47	Buldhana Municipal Council	B & C	Buldhana	5	0	0.0
48	Lonar Municipal Council	B & C	Buldhana	1	0	0.0
49	Jalgaon Jamod Municipal Council	B & C	Buldhana	0.63	0	0.0
50	Deulgaon Raja Municipal Council	B & C	Buldhana	1.1	0	0.0
51	Sindkhed Raja Municipal Council	B & C	Buldhana	0.6	0	0.0
52	Bhadravati Municipal Council	B & C	Chandrapur	2.1	0	0.0
53	Ballarpur Municipal Council	B & C	Chandrapur	12.83	0	0.0
54	Warora Municipal Council	B & C	Chandrapur	4.5	0	0.0
55	Gadchandur Municipal Council	B & C	Chandrapur	1.44	0	0.0
56	Mool Municipal Council	B & C	Chandrapur	1.4	0	0.0
57	Chimur Municipal Council	B & C	Chandrapur	2.05	0	0.0
58	Rajura Municipal Council	B & C	Chandrapur	3.2	0	0.0
59	Bramhapuri Municipal Council	B & C	Chandrapur	0.88	0	0.0
60	Nagbhid Municipal Council	B & C	Chandrapur	2.01	0	0.0
61	Dondaicha-Varwade Municipal Council	B & C	Dhule	6	0	0.0

SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
Sr. No.	**Name of Municipal Council**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
62	Shirpur-Varwade Municipal Council	B & C	Dhule	12.5	12.5	100.0
63	Sindkheda Municipal Council	B & C	Dhule	1.6	0	0.0
64	Gadchiroli Municipal Council	B & C	Gadchiroli	4.8	0	0.0
65	Desaiganj (Wadsa) Municipal Council	B & C	Gadchiroli	1.84	0	0.0
66	Gondia Municipal Council	A	Gondia	11	0	0.0
67	Tirora Municipal Council	B & C	Gondia	2	0	0.0
68	Basmatnagar Municipal Council	B & C	Hingoli	2.9	0	0.0
69	Hingoli Municipal Council	B & C	Hingoli	7.2	0	0.0
70	Kalamnuri Municipal Council	B & C	Hingoli	1.8	0	0.0
71	Bhusawal Municipal Council	A	Jalgaon	11.4	0	0.0
72	Pachora Municipal Council	B & C	Jalgaon	32	0	0.0
73	Chalisgaon Municipal Council	B & C	Jalgaon	7.21	0	0.0
74	Chopda Municipal Council	B & C	Jalgaon	3.2	0	0.0
75	Amalner Municipal Council	B & C	Jalgaon	3.15	0	0.0
76	Jamner Municipal Council	B & C	Jalgaon	11	0	0.0
77	Raver Municipal Council	B & C	Jalgaon	11	0	0.0
78	Yawal Municipal Council	B & C	Jalgaon	0.3	0	0.0
79	Varangaon Municipal Council	B & C	Jalgaon	3.8	0	0.0
80	Dharangaon Municipal Council	B & C	Jalgaon	8.4	0	0.0

SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
Sr. No.	**Name of Municipal Council**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
81	Faizpur Municipal Council	B & C	Jalgaon	1	0	0.0
82	Erandol Municipal Council	B & C	Jalgaon	9.1	0	0.0
83	Bhadgaon Municipal Council	B & C	Jalgaon	9.5	0	0.0
84	Parola Municipal Council	B & C	Jalgaon	3.49	0	0.0
85	Savda Municipal Council	B & C	Jalgaon	0.57	0	0.0
86	Jalna Municipal Council	A	Jalna	15	0	0.0
87	Partur Municipal Council	B & C	Jalna	1.5	0	0.0
88	Bhokardan Municipal Council	B & C	Jalna	1.2	0	0.0
89	Ambad Municipal Council	B & C	Jalna	2.4	0	0.0
90	Ichalkaranji Municipal Council	A	Kolhapur	38	20	52.6
91	Jaysingpur Municipal Council	B & C	Kolhapur	4.64	0	0.0
92	Kagal Municipal Council	B & C	Kolhapur	2.4	0	0.0
93	Gadhinglaj Municipal Council	B & C	Kolhapur	2.4	0	0.0
94	Kurundwad Municipal Council	B & C	Kolhapur	0.8	0	0.0
95	Murgud Municipal Council	B & C	Kolhapur	0.64	0	0.0
96	Malkapur Municipal Council	B & C	Kolhapur	0.2	0	0.0
97	Panhala Municipal Council	B & C	Kolhapur	0.45	0	0.0
98	Vadgaon Municipal Council	B & C	Kolhapur	0.9	0	0.0
99	Udgir Municipal Council	A	Latur	5.4	0	0.0

SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
Sr. No.	**Name of Municipal Council**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
100	Ahmedpur Municipal Council	B & C	Latur	1.8	0	0.0
101	Nilanga Municipal Council	B & C	Latur	1.7	0	0.0
102	Ausa Municipal Council	B & C	Latur	3.6	0	0.0
103	Kamptee Municipal Council	B & C	Nagpur	7	0	0.0
104	Katol Municipal Council	B & C	Nagpur	6	0	0.0
105	Umred Municipal Council	B & C	Nagpur	4.5	0	0.0
106	Wadi Municipal Council	B & C	Nagpur	6.5	0	0.0
107	Mowad Municipal Council	B & C	Nagpur	7.4	0	0.0
108	Narkhed Municipal Council	B & C	Nagpur	0.9	0	0.0
109	Ramtek Municipal Council	B & C	Nagpur	1.44	0	0.0
110	Kanhann Pimpari Municipal Council	B & C	Nagpur	1.56	0	0.0
111	Kalmeshwar Municipal Council	B & C	Nagpur	4.5	0	0.0
112	Savner Municipal Council	B & C	Nagpur	2	0	0.0
113	Khapa Municipal Council	B & C	Nagpur	1.05	0	0.0
114	Mohapa Municipal Council	B & C	Nagpur	0.68	0	0.0
115	Mahadula Municipal Council	B & C	Nagpur	1.28	0	0.0
116	Mouda Municipal Council	B & C	Nagpur	1.1	0	0.0
117	Butibori Municipal council	B & C	Nagpur	1	0	0.0
118	Deglur Municipal Council	B & C	Nanded	4.8	0	0.0

SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
Sr. No.	**Name of Municipal Council**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
119	Mudkhed Municipal Council	B & C	Nanded	0.92	0	0.0
120	Kinwat Municipal Council	B & C	Nanded	2.4	0	0.0
121	Kundalwadi Municipal Council	B & C	Nanded	0.8	0	0.0
122	Kandhar Municipal Council	B & C	Nanded	2.2	0	0.0
123	Biloli Municipal Council	B & C	Nanded	0.8	0	0.0
124	Loha Municipal Council	B & C	Nanded	1.2	0	0.0
125	Mukhed Municipal Council	B & C	Nanded	1.54	0	0.0
126	Bhokar Municipal Council	B & C	Nanded	2	0	0.0
127	Hadgaon Municipal Council	B & C	Nanded	0.96	0	0.0
128	Dharmabad Municipal Council	B & C	Nanded	2	0	0.0
129	Umri Municipal Council	B & C	Nanded	0.96	0	0.0
130	Nandurbar Municipal Council	A	Nandurbar	12	9.3	77.5
131	Shahada Municipal Council	B & C	Nandurbar	3.43	0.0	0.0
132	Taloda Municipal Council	B & C	Nandurbar	2	0	0.0
133	Navapur Municipal Council	B & C	Nandurbar	12	0	0.0
134	Sinnar Municipal Council	B & C	Nashik	4.3	0	0.0
135	Manmad Municipal Council	B & C	Nashik	6	0	0.0
136	Yeola Municipal Council	B & C	Nashik	2.8	0	0.0
137	Trimbak Municipal Council	B & C	Nashik	4	1	25.0

SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
Sr. No.	**Name of Municipal Council**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
138	Bhagur Municipal Council	B & C	Nashik	0.87	0	0.0
139	Nandgaon Municipal Council	B & C	Nashik	1.2	0	0.0
140	Chandwad Municipal Council	B & C	Nashik	0.8	0	0.0
141	Satana Municipal Council	B & C	Nashik	1.47	0	0.0
142	Igatpuri Municipal Council	B & C	Nashik	4.2	0	0.0
143	Osmanabad Municipal Council	A	Osmanabad	5.3	0	0.0
144	Kalamb Municipal Council	B & C	Osmanabad	1.25	0	0.0
145	Paranda Municipal Council	B & C	Osmanabad	1	0	0.0
146	Bhoom Municipal Council	B & C	Osmanabad	1.3	0	0.0
147	Tuljapur Municipal Council	B & C	Osmanabad	1.9	0	0.0
148	Naldurg Municipal Council	B & C	Osmanabad	1.2	0	0.0
149	Omerga Municipal Council	B & C	Osmanabad	2.4	0	0.0
150	Murum Municipal Council	B & C	Osmanabad	1.25	0	0.0
151	Dahanu Municipal Council	B & C	Palghar	4	0	0.0
152	Palghar Municipal Council	B & C	Palghar	2.4	0	0.0
153	Jawhar Municipal Council	B & C	Palghar	1.5	0	0.0
154	Jintur Municipal Council	B & C	Parbhani	2.1	0	0.0
155	Gangakhed Municipal Council	B & C	Parbhani	3	0	0.0
156	Sailu Municipal Council	B & C	Parbhani	2	0	0.0

SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
Sr. No.	**Name of Municipal Council**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
157	Purna Municipal Council	B & C	Parbhani	1.75	0	0.0
158	Sonpeth Municipal Council	B & C	Parbhani	3.5	0	0.0
159	Pathri Municipal Council	B & C	Parbhani	1.5	0	0.0
160	Manwath Municipal Council	B & C	Parbhani	1.8	0	0.0
161	Baramati Municipal Council	A	Pune	11.4	11.4	100.0
162	Talegaon Dhabade Municipal Council	B & C	Pune	8.5	0	0.0
163	Daund Municipal Council	B & C	Pune	4.2	0	0.0
164	Lonavala Municipal Council	B & C	Pune	16.5	0	0.0
165	Junnar Municipal Council	B & C	Pune	2.2	0	0.0
166	Indapur Municipal Council	B & C	Pune	2.4	0	0.0
167	Shirur Municipal Council	B & C	Pune	5	2.5	50.0
168	Jejuri Municipal Council	B & C	Pune	2.4	0	0.0
169	Alandi Municipal Council	B & C	Pune	2.5	0	0.0
170	Saswad Municipal Council	B & C	Pune	3.4	2	58.8
171	Rajgurunagar Municipal Council	B & C	Pune	4	0	0.0
172	Bhor Municipal Council	B & C	Pune	0.9	0	0.0
173	Chakan Municipal Council	B & C	Pune	4	0	0.0
174	Khopoli Municipal Council	B & C	Raigad	5.6	0	0.0
175	Murud-Janjira Municipal Council	B & C	Raigad	1.3	0	0.0

SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
Sr. No.	**Name of Municipal Council**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
176	Matheran Municipal Council	B & C	Raigad	1.1	0	0.0
177	Shrivardhan Municipal Council	B & C	Raigad	1.8	0	0.0
178	Karjat Municipal Council	B & C	Raigad	4.8	0	0.0
179	Roha Municipal Council	B & C	Raigad	2.8	0	0.0
180	Mahad Municipal Council	B & C	Raigad	3.7	0	0.0
181	Pen Municipal Council	B & C	Raigad	4.8	0	0.0
182	Uran Municipal Council	B & C	Raigad	3.6	0	0.0
183	Alibag Municipal Council	B & C	Raigad	4.4	0	0.0
184	Ratnagiri Municipal Council	B & C	Ratnagiri	8.8	0	0.0
185	Chiplun Municipal Council	B & C	Ratnagiri	7	0	0.0
186	Rajapur Municipal Council	B & C	Ratnagiri	2	0	0.0
187	Khed Municipal Council	B & C	Ratnagiri	2.5	0	0.0
188	Dapoli Municipal Council (Nagar Panchayat)	B & C	Ratnagiri	3	0	0.0
189	Islampur Municipal Council	B & C	Sangli	9	0	0.0
190	Vita Municipal Council	B & C	Sangli	4.87	0	0.0
191	Palus Municipal Council	B & C	Sangli	2.5	0	0.0
192	Jat Municipal Council	B & C	Sangli	1.5	0	0.0
193	Ashta Municipal Council	B & C	Sangli	2.1	0	0.0
194	Tasgaon Municipal Council	B & C	Sangli	2.63	0	0.0

SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
Sr. No.	**Name of Municipal Council**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
195	Satara Municipal Council	A	Satara	12.8	0	0.0
196	Karad Municipal Council	B & C	Satara	9.5	9.5	100.0
197	Phaltan Municipal Council	B & C	Satara	5	0	0.0
198	Wai Municipal Council	B & C	Satara	4.8	0	0.0
199	Mahabaleshwar Municipal Council	B & C	Satara	2.5	2.5	100.0
200	Rahimatpur Municipal Council	B & C	Satara	0.8	0	0.0
201	Mhaswad Municipal Council	B & C	Satara	2.1	0	0.0
202	Panchgani Municipal Council	B & C	Satara	1.8	1.8	100.0
203	Malkapur Municipal Council	B & C	Satara	5.2	5.2	100.0
204	Malvan Municipal Council	B & C	Sindhudurg	0.5	0	0.0
205	Vengurla Municipal Council	B & C	Sindhudurg	2.5	0	0.0
206	Sawantvadi Municipal Council	B & C	Sindhudurg	2.5	0	0.0
207	Kankavli Municipal Council (Nagar Panchayat)	B & C	Sindhudurg	1.2	0	0.0
208	Barshi Municipal Council	A	Solapur	12.82	0	0.0
209	Pandharpur Municipal Council	B & C	Solapur	16	12.5	78.1
210	Akkalkot Municipal Council	B & C	Solapur	4	0	0.0
211	Kurduvadi Municipal Council	B & C	Solapur	3.5	0	0.0
212	Maindargi Municipal Council	B & C	Solapur	0.69	0	0.0
213	Karmala Municipal Council	B & C	Solapur	2	0	0.0

SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
Sr. No.	**Name of Municipal Council**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
214	Dudhani Municipal Council	B & C	Solapur	0.69	0	0.0
215	Sangola Municipal Council	B & C	Solapur	4	0	0.0
216	Mangalwedha Municipal Council	B & C	Solapur	2.4	0	0.0
217	Mohol Municipal Council	B & C	Solapur			0.0
218	Ambarnath Municipal Council	A	Thane	28	28	100.0
219	Zari Jamni Nagar Panchayat	A	Thane	20	20	100.0
220	Hingan Ghat Municipal Council	A	Wardha	10	0	0.0
221	Wardha Municipal Council	A	Wardha	11	0	0.0
222	Arvi Municipal Council	B & C	Wardha	2.4	0	0.0
223	Sindi Municipal Council	B & C	Wardha	1	0	0.0
224	Deoli Municipal Council	B & C	Wardha	1.6	0	0.0
225	Pulgaon Municipal Council	B & C	Wardha	1.8	0	0.0
226	Karanja Municipal Council	B & C	Washim	4	0	0.0
227	Washim Municipal Council	B & C	Washim	6.5	6.5	100.0
228	Mangrulpir Municipal Council	B & C	Washim	2.4	0	0.0
229	Risod Municipal Council	B & C	Washim	1.6	0	0.0
230	Yavatmal Municipal Council	A	Yavatmal	8.69	0	0.0
231	Wani Municipal Council	B & C	Yavatmal	4.11	0	0.0
232	Umarkhed Municipal Council	B & C	Yavatmal	2.04	0	0.0

SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
Sr. No.	**Name of Municipal Council**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
233	Digras Municipal Council	B & C	Yavatmal	2.02	0	0.0
234	Pusad Municipal Council	B & C	Yavatmal	4.02	0	0.0
235	Ner Nababpur Nagar Parishad	B & C	Yavatmal	1.5	0	0.0
236	Darwha Municipal Council	B & C	Yavatmal	1.82	0	0.0
237	Pandharkawada Municipal Council	B & C	Yavatmal	1.99	0	0.0
238	Arni Municipal Council	B & C	Yavatmal	4.69	0	0.0
239	Ghatanji Municipal Council	B & C	Yavatmal	1.16	0	0.0
				983.49	148.2	15.1
Nagar Panchayat						
Sr. No.	**Name of Nagar Panchayat**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
1	Barshi Takali Nagar Panchayat	NP	Akola	0.2	0	0.0
2	Nandgaon Khandeshwar Nagar Panchayat	NP	Amravati	3.5	0	0.0
3	Bhatkali Nagar Panchayat	NP	Amravati	2.5	0	0.0
4	Dharani Nagar Panchayat	NP	Amravati	0.94	0	0.0
5	Tiwasa Nagar Panchayat	NP	Amravati	0.5	0	0.0
6	Motala Nagar Panchayat	NP	Buldhana	0.5	0	0.0
7	Sangrampur Nagar Panchayat	NP	Buldhana	0.2	0	0.0

SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
Sr. No.	**Name of Nagar Panchayat**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
8	Manora Nagar Panchayat	NP	Washim	0.7	0	0.0
9	Malegaon Nagar Panchayat	NP	Washim	1.5	0	0.0
10	Maregaon Nagar Panchayat	NP	Yavatmal	0.68	0	0.0
11	Ralegaon Nagar Panchayat	NP	Yavatmal	1.25	0	0.0
12	Kalamb Nagar Panchayat	NP	Yavatmal	1.39	0	0.0
13	Babhulgaon Nagar Panchayat	NP	Yavatmal	0.93	0	0.0
14	Mahagaon Nagar Panchayat	NP	Yavatmal	0.65	0	0.0
15	Zari Jamni Nagar Panchayat	NP	Yavatmal	0.12	0	0.0
16	Dhanki Nagar Panchayat	NP	Yavatmal	1.38	0	0.0
17	Phulambri Nagar Panchayat	NP	Aurangabad			0.0
18	Soyagaon Nagar Panchayat	NP	Aurangabad			0.0
19	Shirur Kasar Nagar Panchayat	NP	Beed	0.3	0	0.0
20	Kej Nagar Panchayat	NP	Beed	0.7	0	0.0
21	Ashti Nagar Panchayat	NP	Beed	0.4	0	0.0
22	Patoda Nagar Panchayat	NP	Beed	0.8	0	0.0
23	Wadwani Nagar Panchayat	NP	Beed	0.094	0	0.0
24	Aundha Nagnath Nagar Panchayat	NP	Hingoli	0.8	0	0.0
25	Sengaon Nagar Panchayat	NP	Hingoli	0.15	0	0.0
26	Ghansawangi Nagar Panchayat	NP	Jalna	0.24	0	0.0

SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
Sr. No.	**Name of Nagar Panchayat**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
27	Japharabad Nagar Panchayat	NP	Jalna	1	0	0.0
28	Badnapur Nagar Panchayat	NP	Jalna	0.4	0	0.0
29	Mantha Nagar Panchayat	NP	Jalna	0.9	0	0.0
30	Devani Nagar Panchayat	NP	Latur	0.3	0	0.0
31	Chakur Nagar Panchayat	NP	Latur	0.4	0	0.0
32	Jalkot Nagar Panchayat	NP	Latur	0.3	0	0.0
33	Shirur Anantpal Nagar Panchayat	NP	Latur	0.4	0	0.0
34	Renapur Nagar Panchayat	NP	Latur	0.3	0	0.0
35	Ardhapur Nagar Panchayat	NP	Nanded	0.8	0	0.0
36	Himayatnagar Nagar Panchayat	NP	Nanded	1.2	0	0.0
37	Naygaon Nagar Panchayat	NP	Nanded	1.2	0	0.0
38	Mahur Nagar Panchayat	NP	Nanded	0.8	0	0.0
39	Lohara Bu Nagar Panchayat	NP	Osmanabad	0.45	0	0.0
40	Washi Nagar Panchayat	NP	Osmanabad	0.8	0	0.0
41	Palam Nagar Panchayat	NP	Parbhani	0.5	0	0.0
42	Vikramgad Nagar Panchayat	NP	Palghar		0	0.0
43	Mokhada Nagar Panchayat	NP	Palghar		0	0.0
44	Talasari Nagar Panchayat	NP	Palghar		0	0.0
45	Wada Nagar Panchayat	NP	Palghar		0	0.0

SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
Sr. No.	**Name of Nagar Panchayat**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
46	Mangaon Nagar Panchayat	NP	Raigad		0	0.0
47	Poladpur Nagar Panchayat	NP	Raigad		0	0.0
48	Tala Nagar Panchayat	NP	Raigad		0	0.0
49	Khalapur Nagar Panchayat	NP	Raigad	1.6	0	0.0
50	Mhasala Nagar Panchayat	NP	Raigad		0	0.0
51	Lanja Nagar Panchayat	NP	Ratnagiri	2	0	0.0
52	Devrukh Nagar Panchayat	NP	Ratnagiri	1.6	0	0.0
53	Guhagar Nagar Panchayat	NP	Ratnagiri	0.6		0.0
54	Mandangad Nagar Panchayat	NP	Ratnagiri	0.33	0	0.0
55	Vaibhavwadi Nagar Panchayat	NP	Sindhudurg	0.14	0	0.0
56	Kasai-Dodamarg Nagar Panchayat	NP	Sindhudurg	0.1	0	0.0
57	Kudal Nagar Panchayat	NP	Sindhudurg	1.2	0	0.0
58	Devgadjamsande Nagar Panchayat	NP	Sindhudurg	2.2	0	0.0
59	Shahapur Nagar Panchayat	NP	Thane	0.5	0	0.0
60	Murbad Nagar Panchayat	NP	Thane	2	0	0.0
61	Lakhani Nagar Panchayat	NP	Bhandara	0.9	0	0.0
62	Sakoli Nagar Panchayat	NP	Bhandara	1.1	0	0.0
63	Lakhandur Nagar Panchayat	NP	Bhandara	0.9	0	0.0
64	Mohadi Nagar Panchayat	NP	Bhandara	0.6	0	0.0

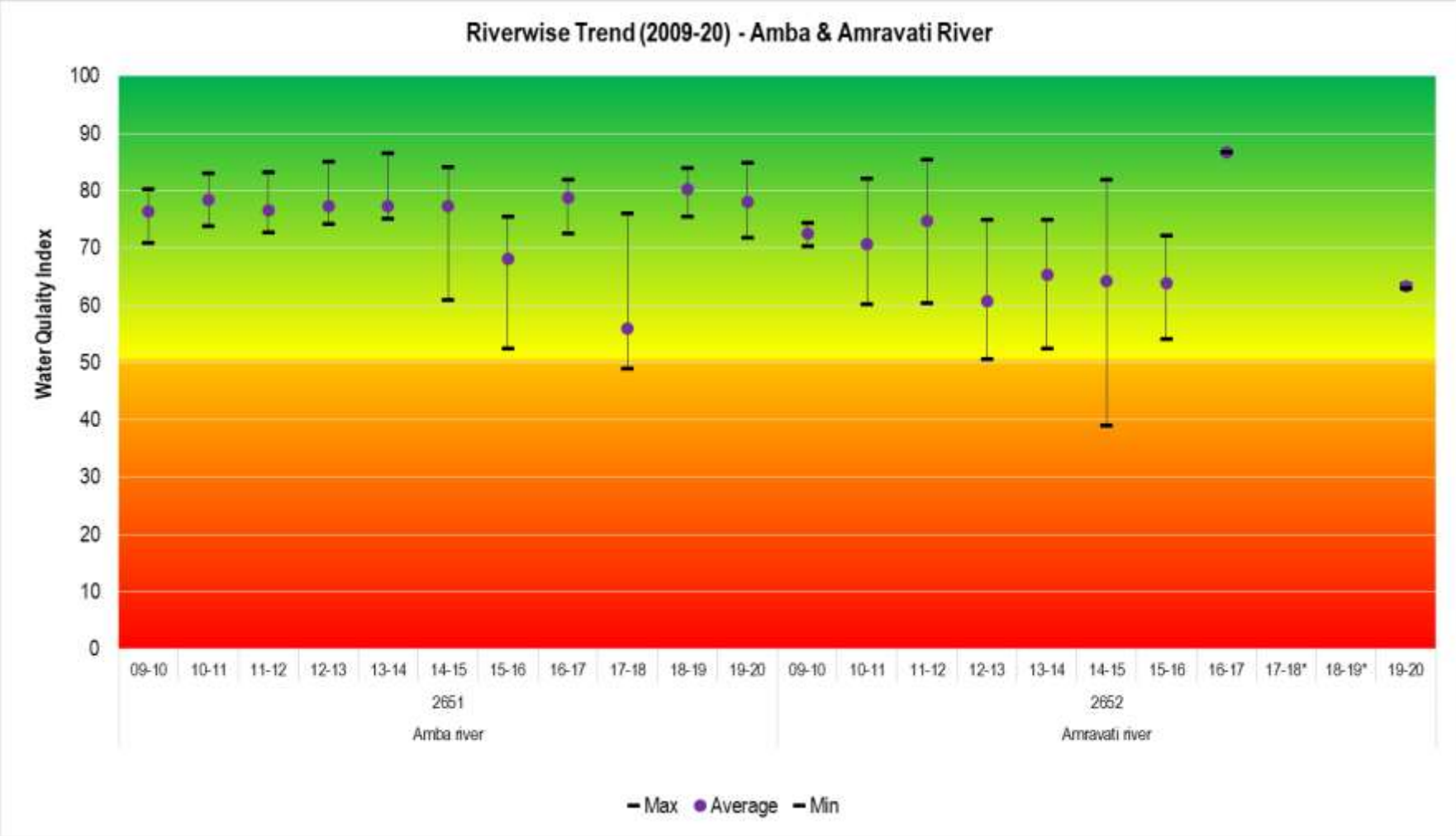
SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
Sr. No.	**Name of Nagar Panchayat**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
65	Sawali Nagar Panchayat	NP	Chandrapur	0.3	0	0.0
66	Pombhurna Nagar Panchayat	NP	Chandrapur	0.72	0	0.0
67	Gondpimpri Nagar Panchayat	NP	Chandrapur	0.52	0	0.0
68	Korpana Nagar Panchayat	NP	Chandrapur	0.36	0	0.0
69	Jiwati Nagar Panchayat	NP	Chandrapur	1.19	0	0.0
70	Sindewahi Nagar Panchayat	NP	Chandrapur	0.4	0	0.0
71	Kurkheda Nagar Panchayat	NP	Gadchiroli	0.35	0	0.0
72	Mulchera Nagar Panchayat	NP	Gadchiroli	0.08	0	0.0
73	Sironcha Nagar Panchayat	NP	Gadchiroli	0.8	0	0.0
74	Etapalli Nagar Panchayat	NP	Gadchiroli	0.8	0	0.0
75	Armori Municipal Council	NP	Gadchiroli	0.3	0	0.0
76	Aheri Nagar Panchayat	NP	Gadchiroli	0.8	0	0.0
77	Bhamragad Nagar Panchayat	NP	Gadchiroli	0.37	0	0.0
78	Chamoshi Nagar Panchayat	NP	Gadchiroli	1.2	0	0.0
79	Dhanora Nagar Panchayat	NP	Gadchiroli	0.48	0	0.0
80	Korchi Nagar Panchayat	NP	Gadchiroli	0.25	0	0.0
81	Sadak-Arjuni Nagar Panchayat	NP	Gondia	0.96	0	0.0
82	Salekasa Nagar Panchayat	NP	Gondia	0.96	0	0.0
83	Amgaon Nagar Panchayat	NP	Gondia	0.65	0	0.0

SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
Sr. No.	**Name of Nagar Panchayat**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
84	Daveri Nagar Panchayat	NP	Gondia	1.6	0	0.0
85	Goregaon Nagar Panchayat	NP	Gondia	0.4	0	0.0
86	Arjuni Nagar Panchayat	NP	Gondia	0.65	0	0.0
87	Hingana Nagar Panchayat	NP	Nagpur	0.6	0	0.0
88	Dhiwapur Nagar Panchayat	NP	Nagpur	1.2	0	0.0
89	Wanadongari Nagar Panchayat	NP	Nagpur	4	0	0.0
90	Kuhi Nagar Panchayat	NP	Nagpur	0.7	0	0.0
91	Parshiwani Nagar Panchayat	NP	Nagpur	0.4	0	0.0
92	Ashti Nagar Panchayat	NP	Wardha	0.85	0	0.0
93	Karanja Nagar Panchayat	NP	Wardha	0.9	0	0.0
94	Samudrapur Nagar Panchayat	NP	Wardha	0.5	0	0.0
95	Selu Nagar Panchayat	NP	Wardha	0.8	0	0.0
96	Parner Nagar Panchayat	NP	Ahmednagar	2.5	0	0.0
97	Karjat Nagar Panchayat	NP	Ahmednagar	3	0	0.0
98	Akole Nagar Panchayat	NP	Ahmednagar	2.6	0	0.0
99	Nevasa Nagar Panchayat	NP	Ahmednagar	2.7	0	0.0
100	Shirdi Nagar Panchayat	NP	Ahmednagar	10	10	100.0
101	Sakri Nagar Panchayat	NP	Dhule	1.4	0	0.0
102	Bodvad Nagar Panchayat	NP	Jalgaon	0.5	0	0.0

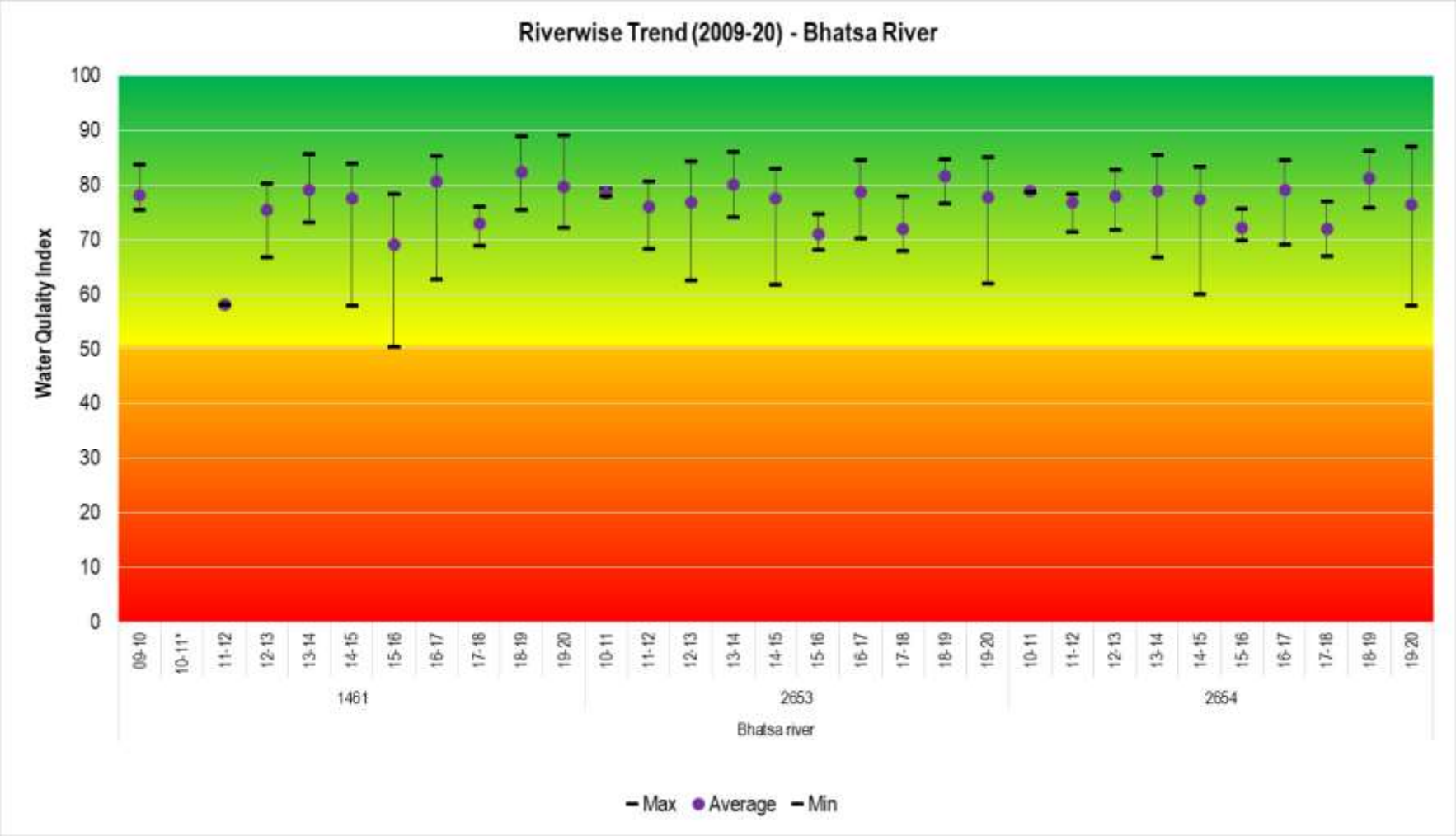
SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
Sr. No.	**Name of Nagar Panchayat**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
103	Dhadgaon Wadphalya-Roshmal Bu Nagar Panchayat	NP	Nandurbar	1.2	0.0	0.0
104	Surgana Nagar Panchayat	NP	Nashik	0.8	0	0.0
105	Peth Nagar Panchayat	NP	Nashik	2.4	0	0.0
106	Niphad Nagar Panchayat	NP	Nashik	1.6	0	0.0
107	Devala Nagar Panchayat	NP	Nashik	0.5	0	0.0
108	Kalawan Nagar Panchayat	NP	Nashik	2.4	0	0.0
109	Dindori Nagar Panchayat	NP	Nashik	2.4	0	0.0
110	Kadegaon Nagar Panchayat	NP	Sangli	1.5	0	0.0
111	Khanapur Nagar Panchayat	NP	Sangli	1	0	0.0
112	Kavathemahankal Nagar Panchayat	NP	Sangli	0.75	0	0.0
113	Shirala Nagar Panchayat	NP	Sangli	1.8	0	0.0
114	Dahivadi Nagar Panchayat	NP	Satara	1.9	0	0.0
115	Lonand Nagar Panchayat	NP	Satara	0.7	0	0.0
116	Medha Nagar Panchayat	NP	Satara	0.44	0	0.0
117	Patan Nagar Panchayat	NP	Satara	1	0	0.0
118	Vaduj Nagar Panchayat	NP	Satara	2.1	0	0.0
119	Khandala Nagar Panchayat	NP	Satara	0.8	0	0.0
120	Koregaon Nagar Panchayat	NP	Satara	2.5	0	0.0
121	Madha Nagar Panchayat	NP	Solapur			0.0

SEWAGE GENERATION AND TREATMENT OF ULBs IN MAHARASHTRA						
122	Malshiras Nagar Panchayat	NP	Solapur	118.524	10	0
				237.048	20	8.43
Cantonment						
Sr. No.	**Name of Cantonment**	**Class**	**District**	**Sewage Geneartion MLD**	**Present treatment (MLD**	**% of Sewage Treatment**
1	Bhinagar Cantonment		Ahmednagar	2		
2	Aurangabad Cantonment		Aurangabad	1.5		
3	Devalali Cantonment		Nashik	0.74	0	
4	Dehu Cantonment		Pune	6		
5	Pune Cantonment		Pune	22.8	9	
6	Khadki Cantonment		Pune	9	7.2	
				42.04	16.2	38.53

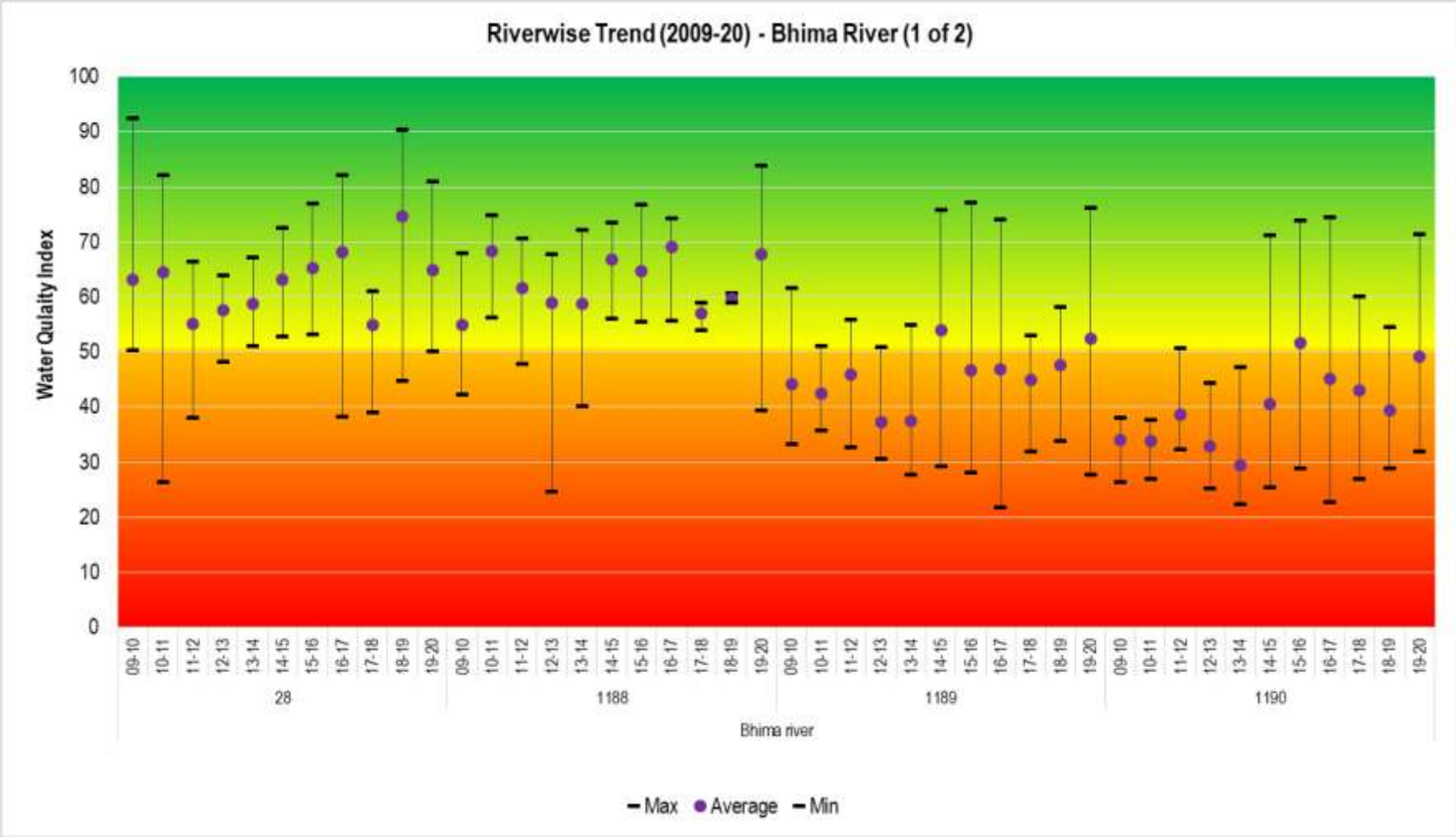
Riverwise Trend in WQI (2009-20)



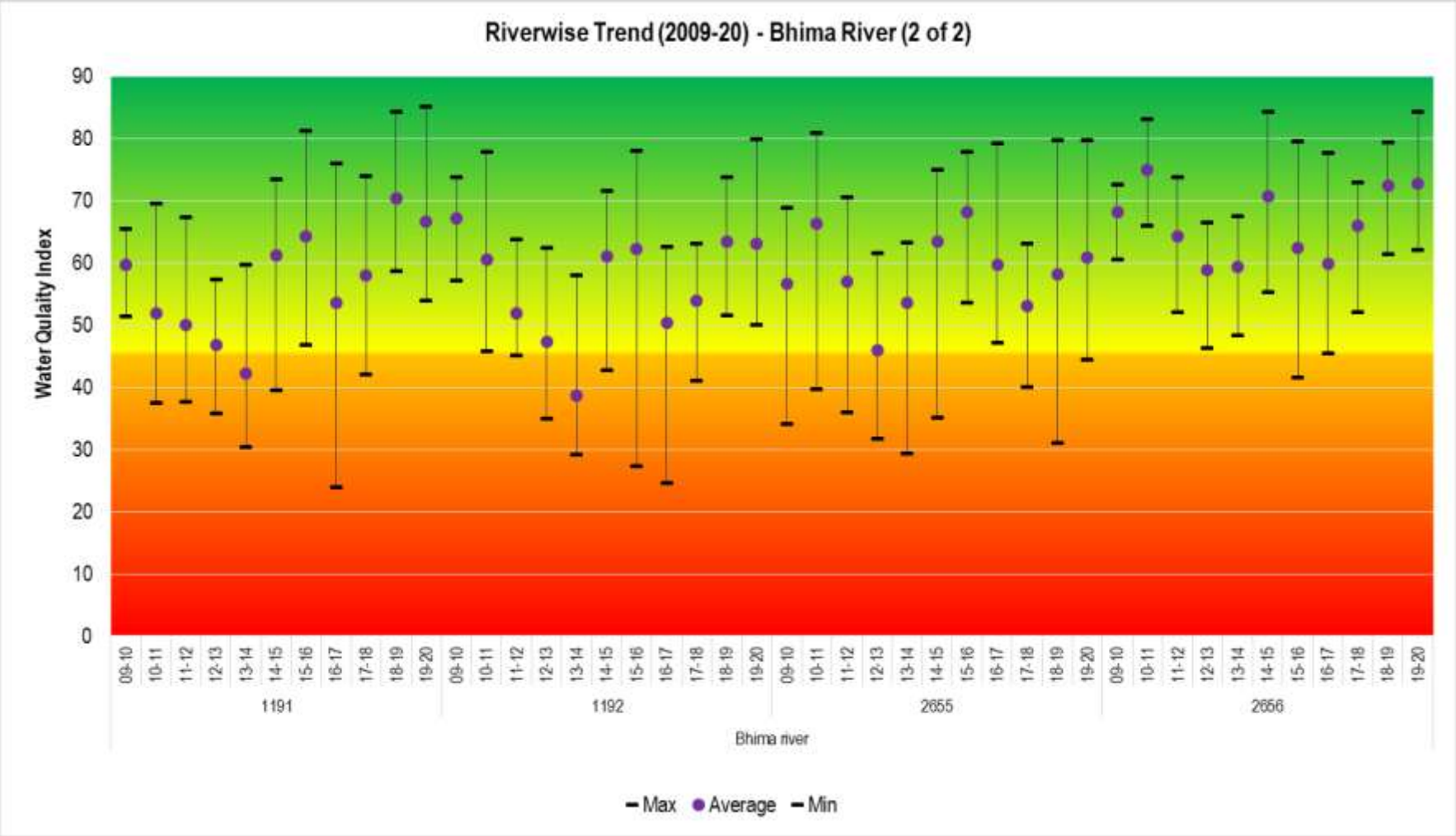
Note:* Stations are Dry/ No data available for respective year



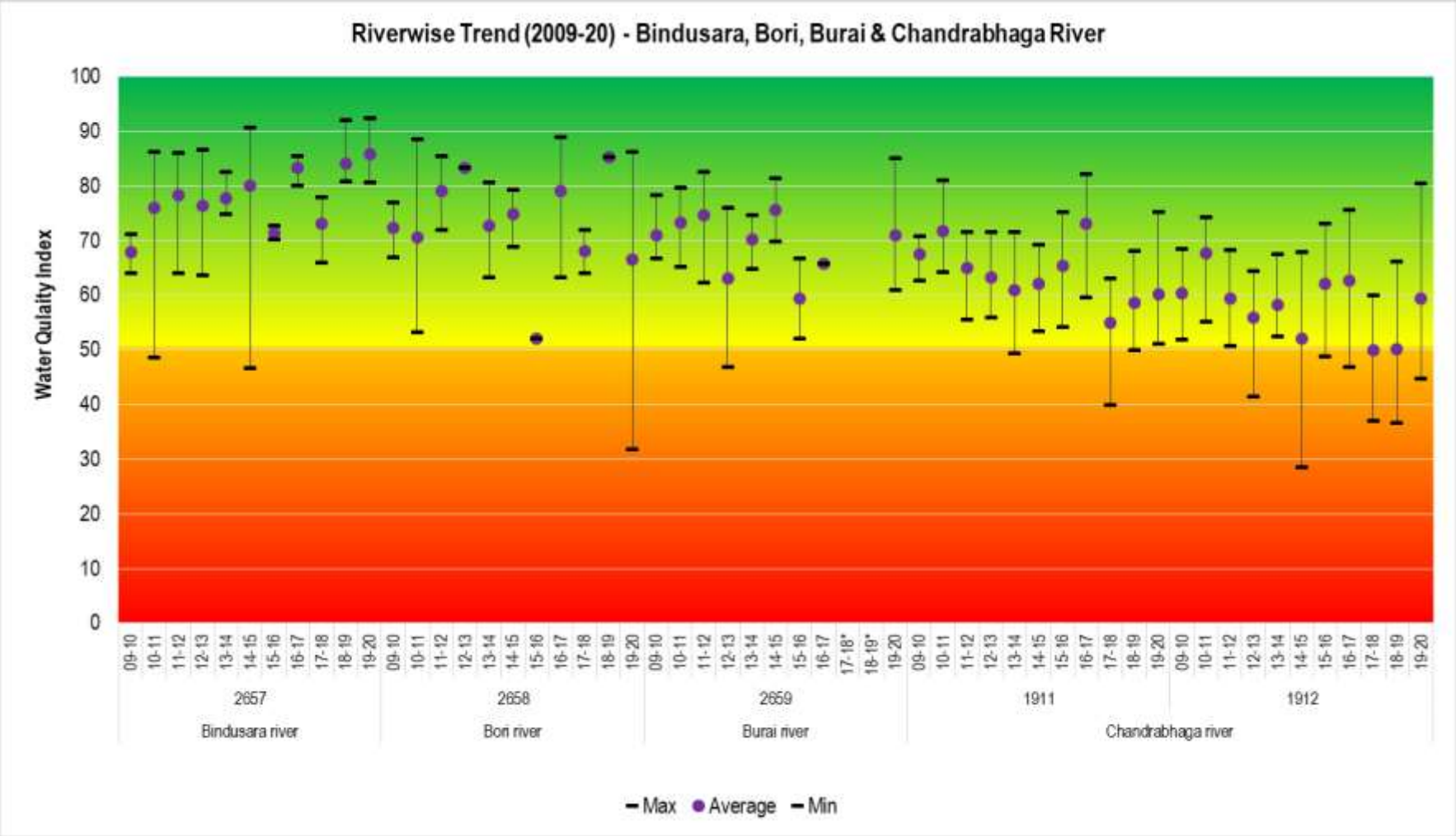
Note:* Stations are Dry/ No data available for respective year



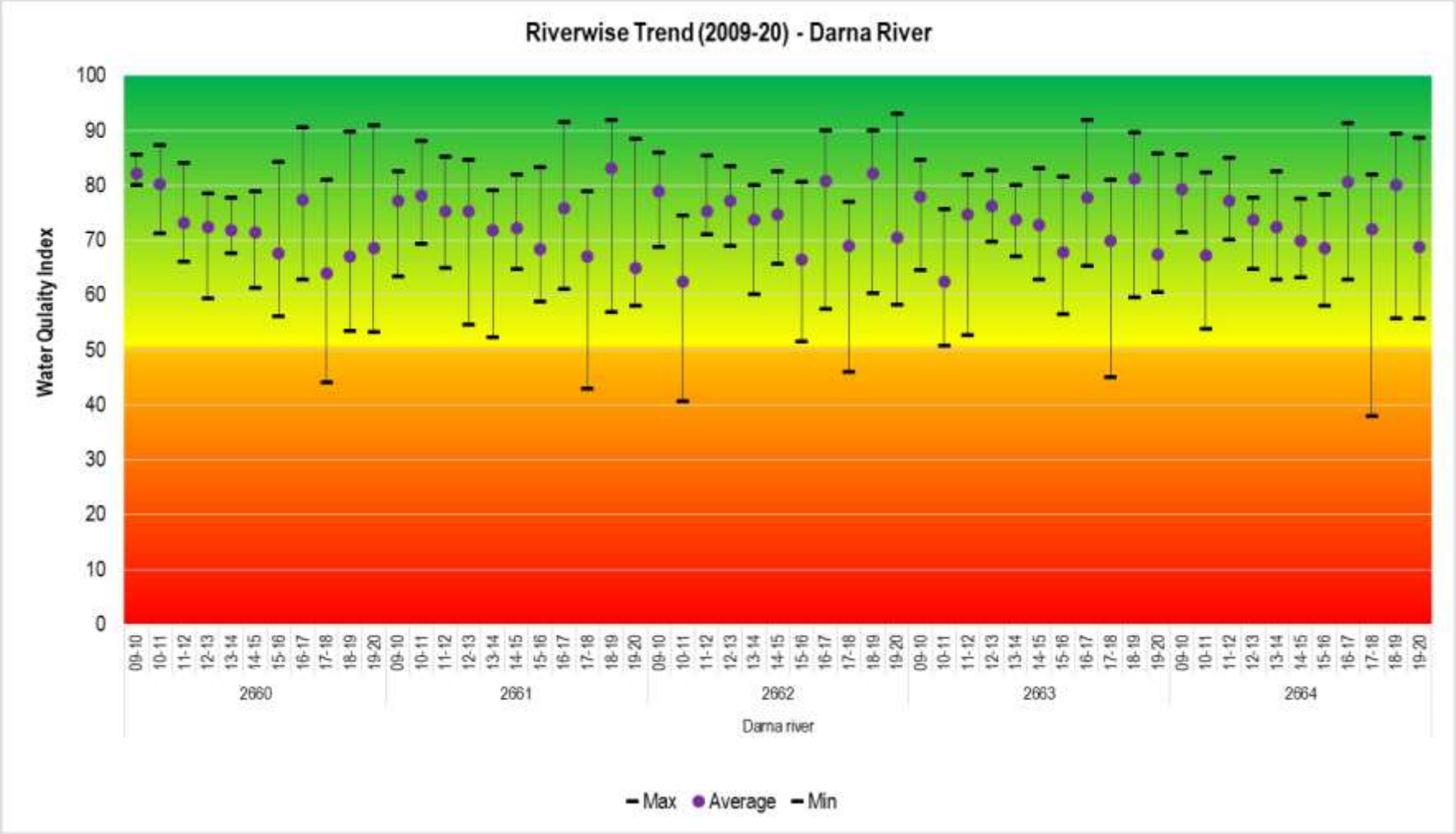
Note:* Stations are Dry/ No data available for respective year



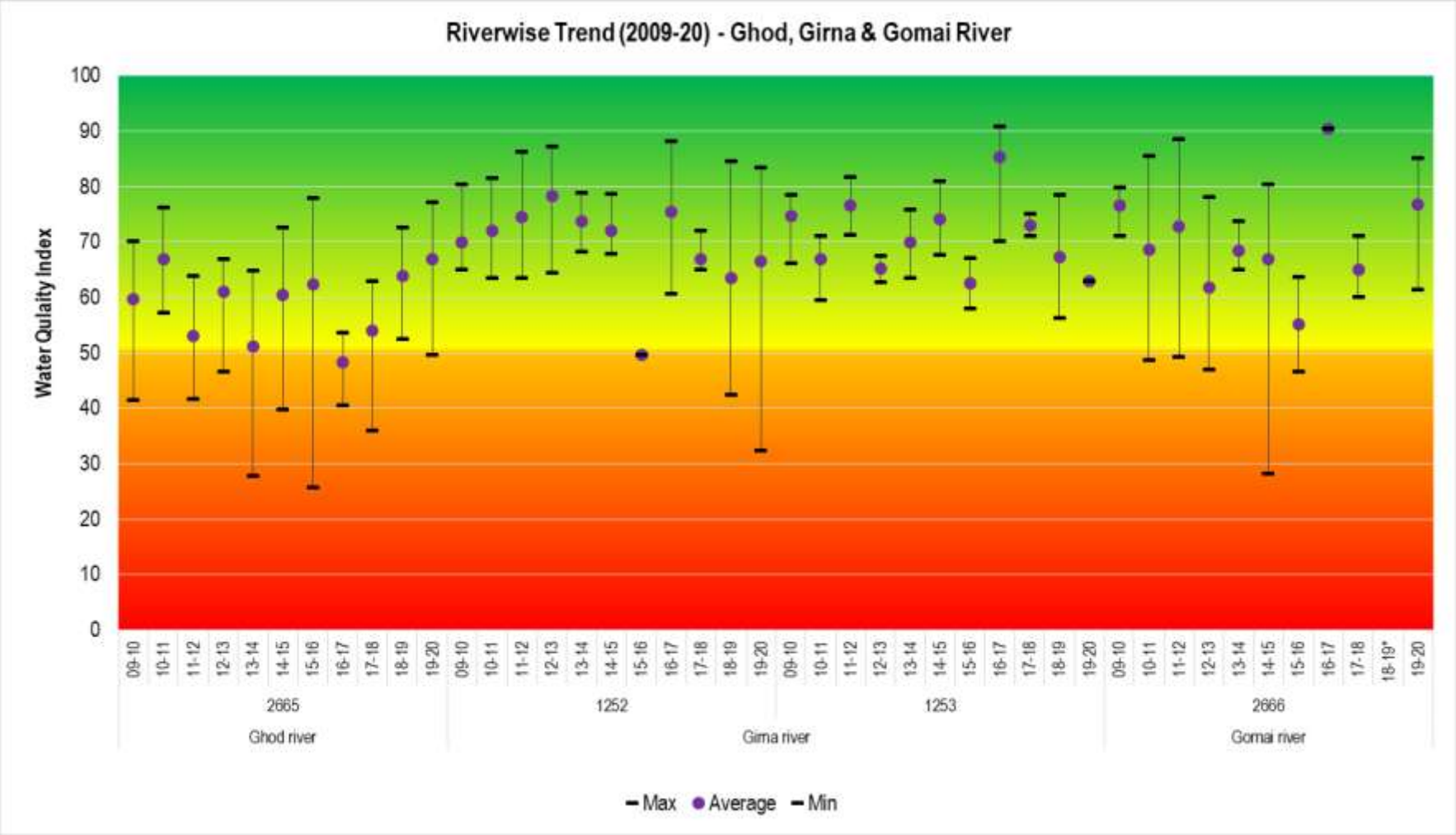
Note:* Stations are Dry/ No data available for respective yea



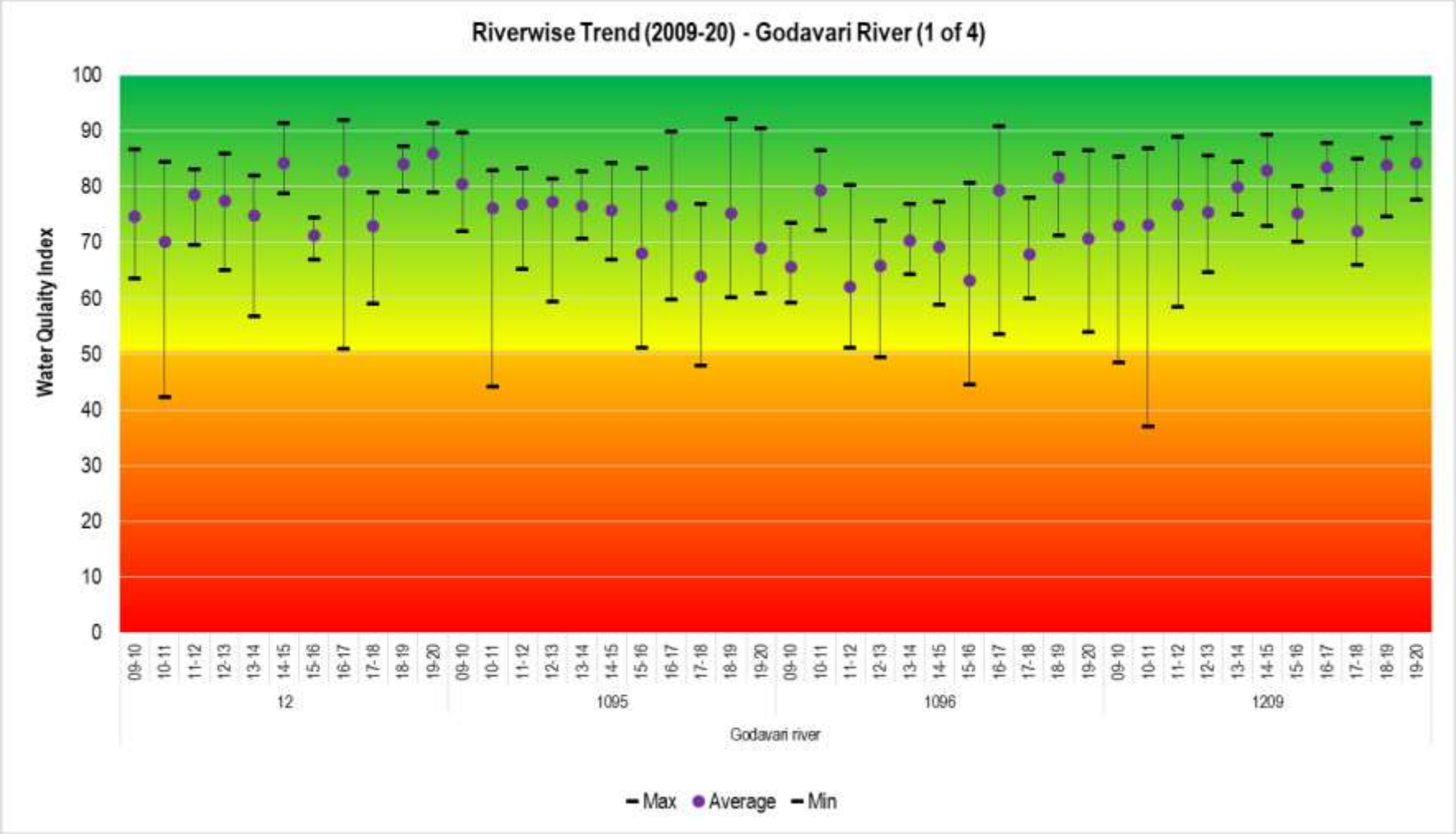
Note:* Stations are Dry/ No data available for respective year



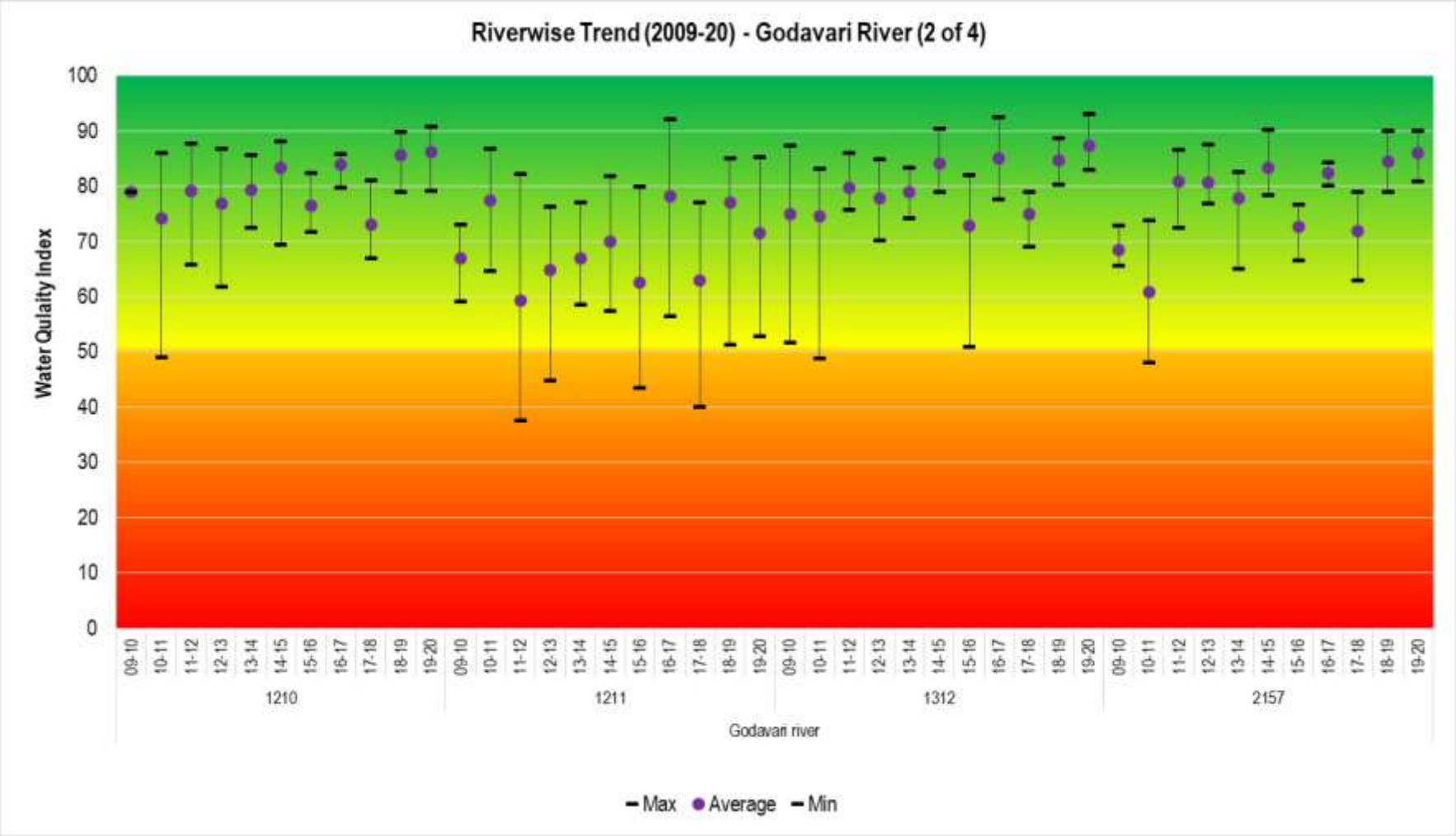
Note:* Stations are Dry/ No data available for respective year



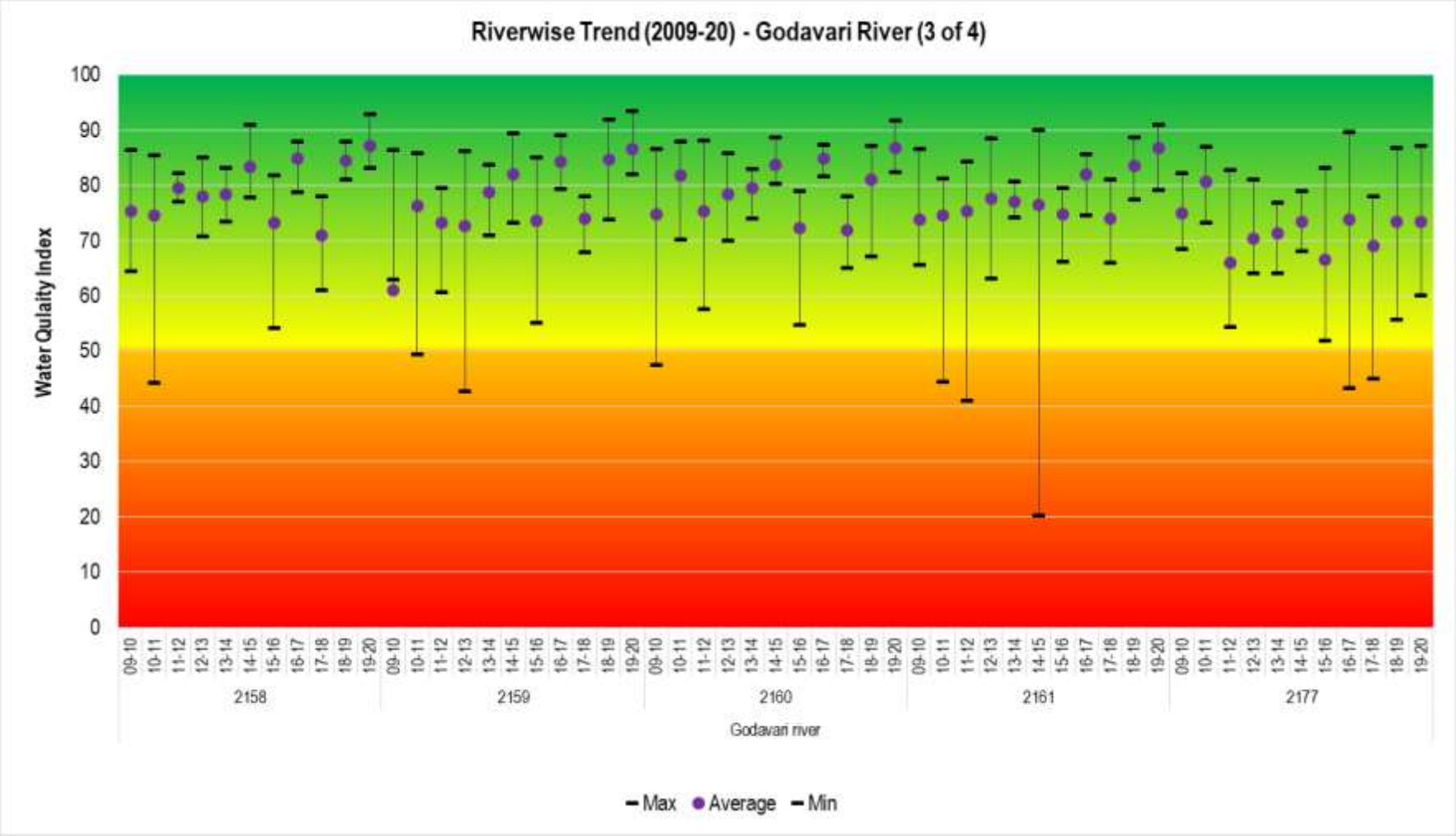
Note:* Stations are Dry/ No data available for respective year



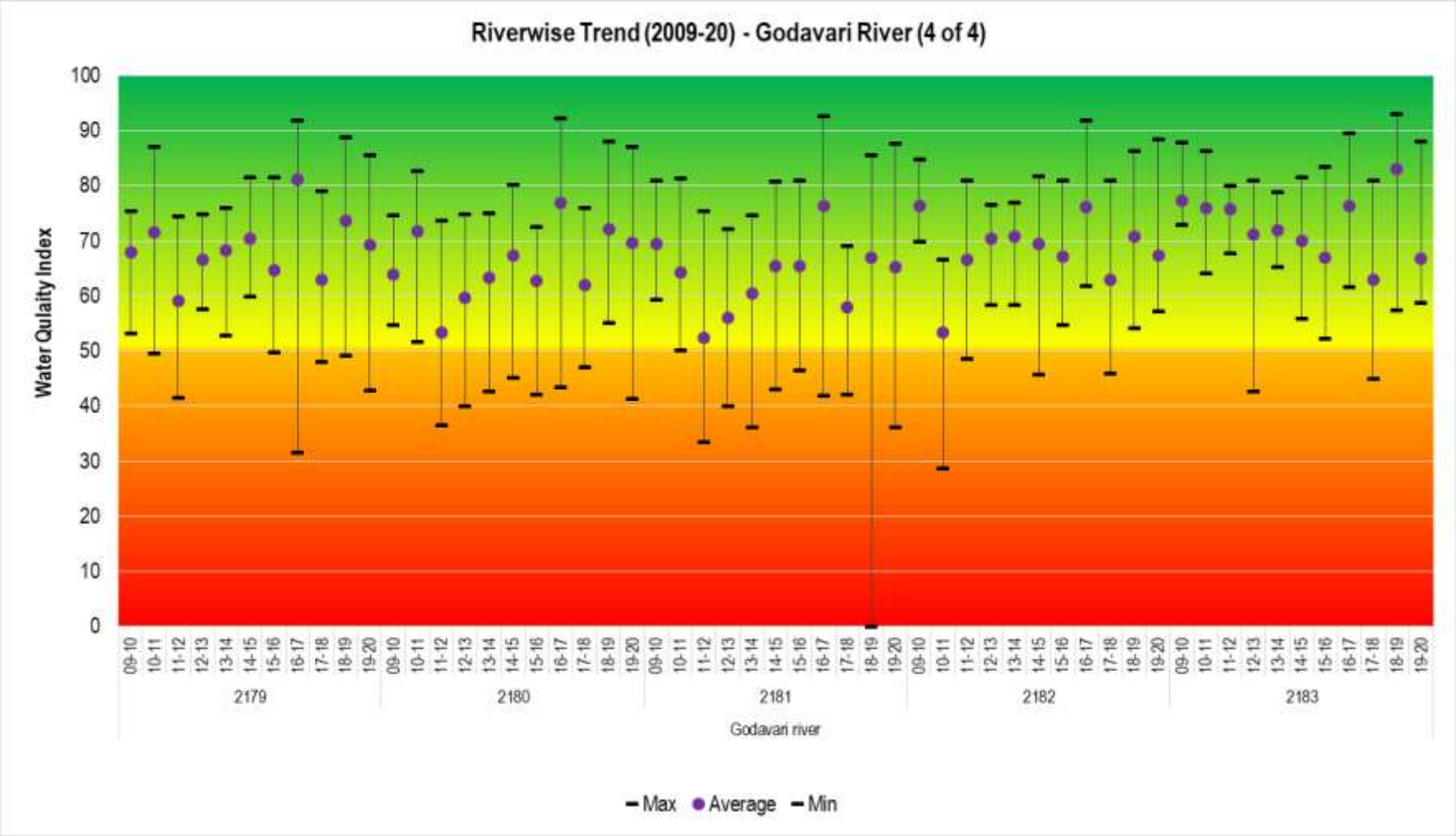
Note:* Stations are Dry/ No data available for respective year



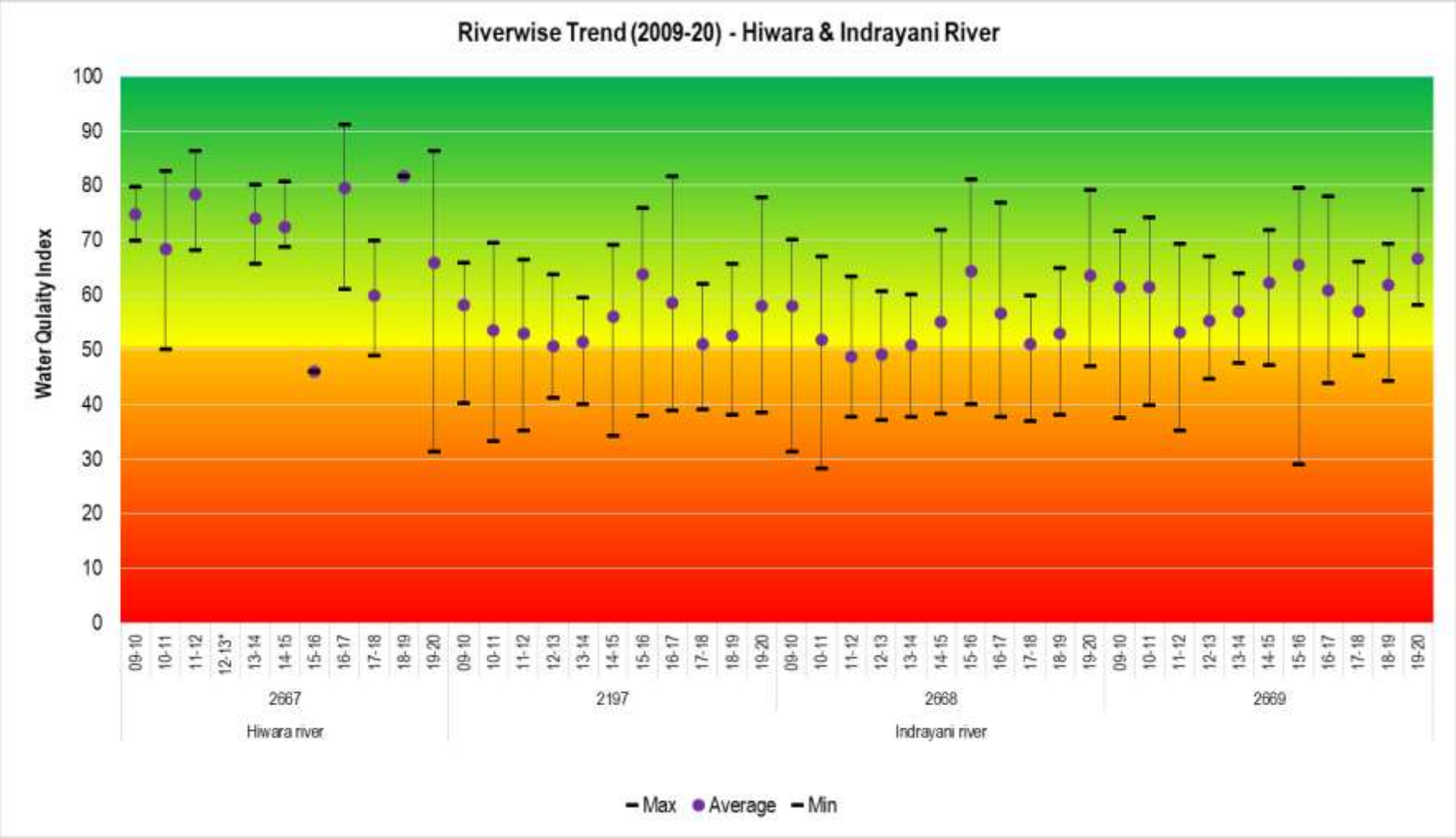
Note:* Stations are Dry/ No data available for respective year



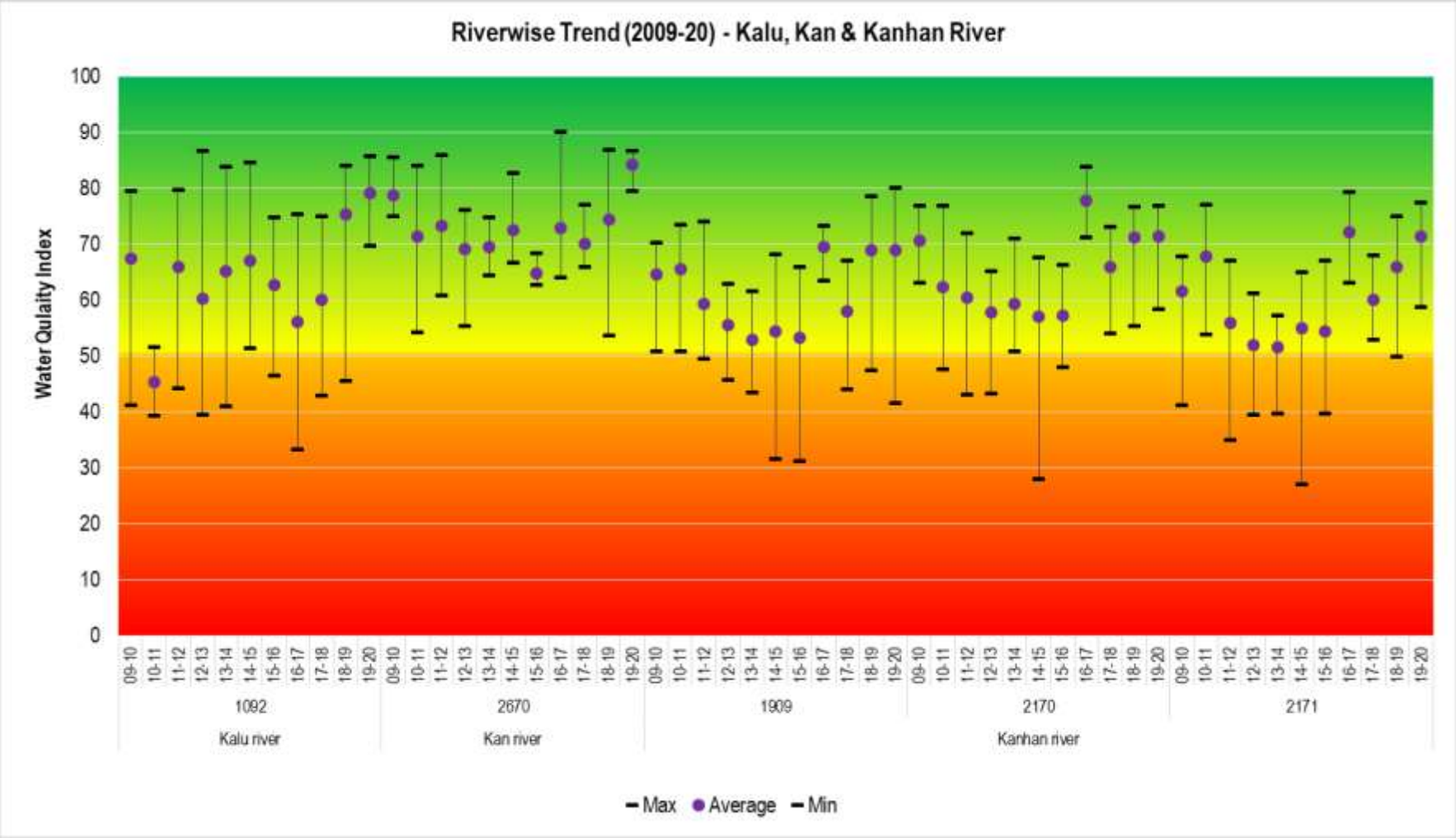
Note:* Stations are Dry/ No data available for respective year



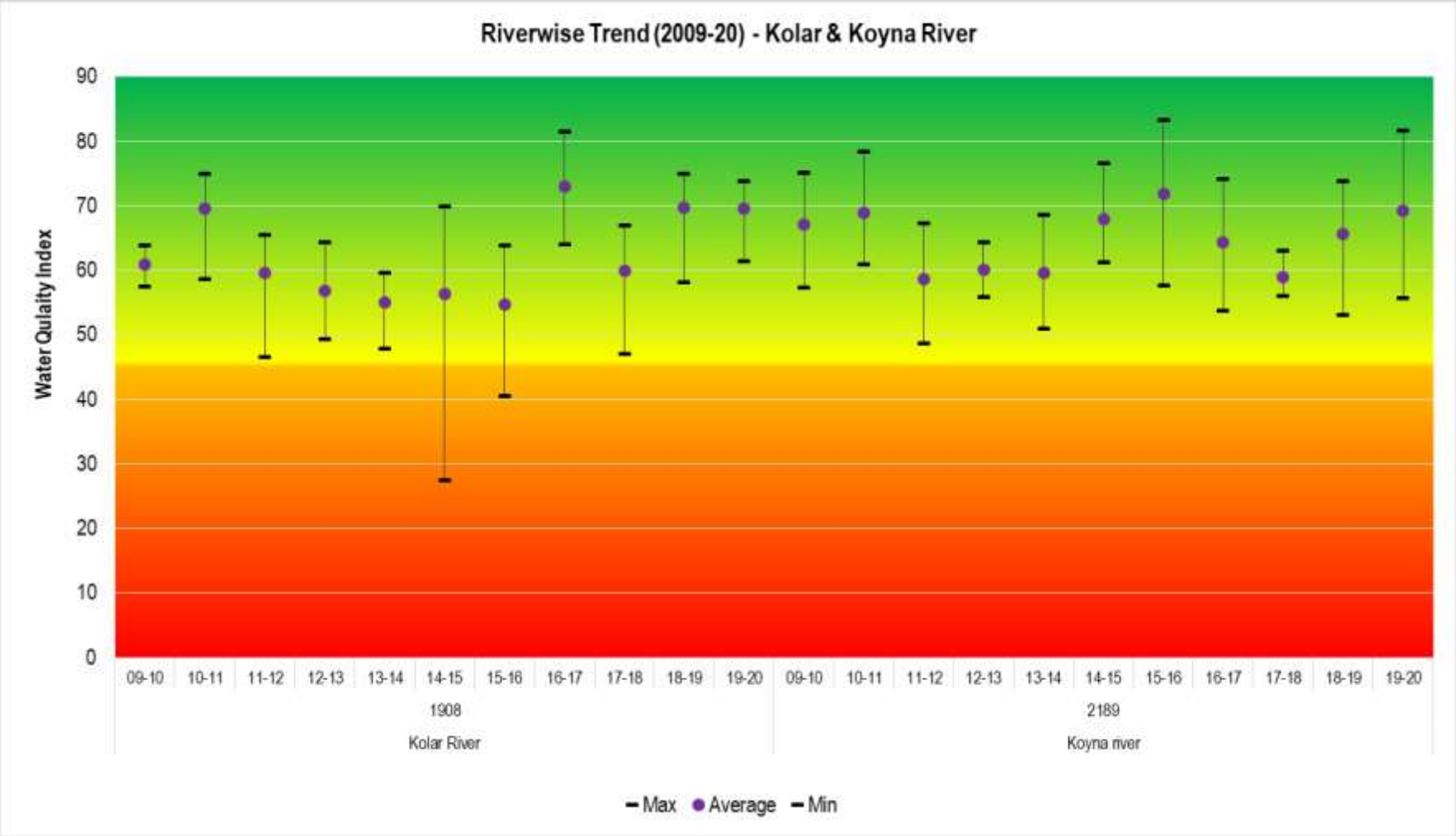
Note:* Stations are Dry/ No data available for respective year



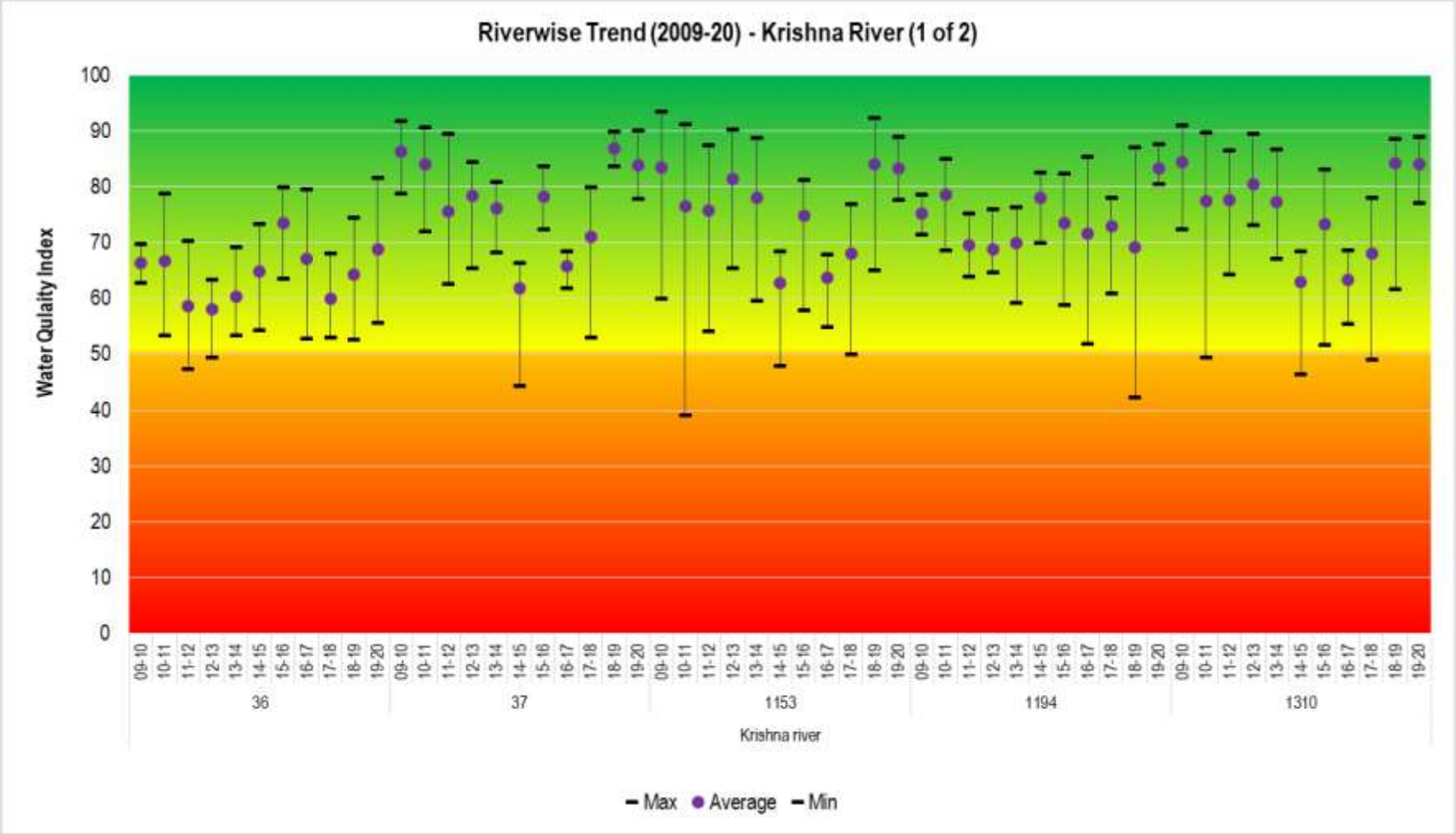
Note:* Stations are Dry/ No data available for respective year



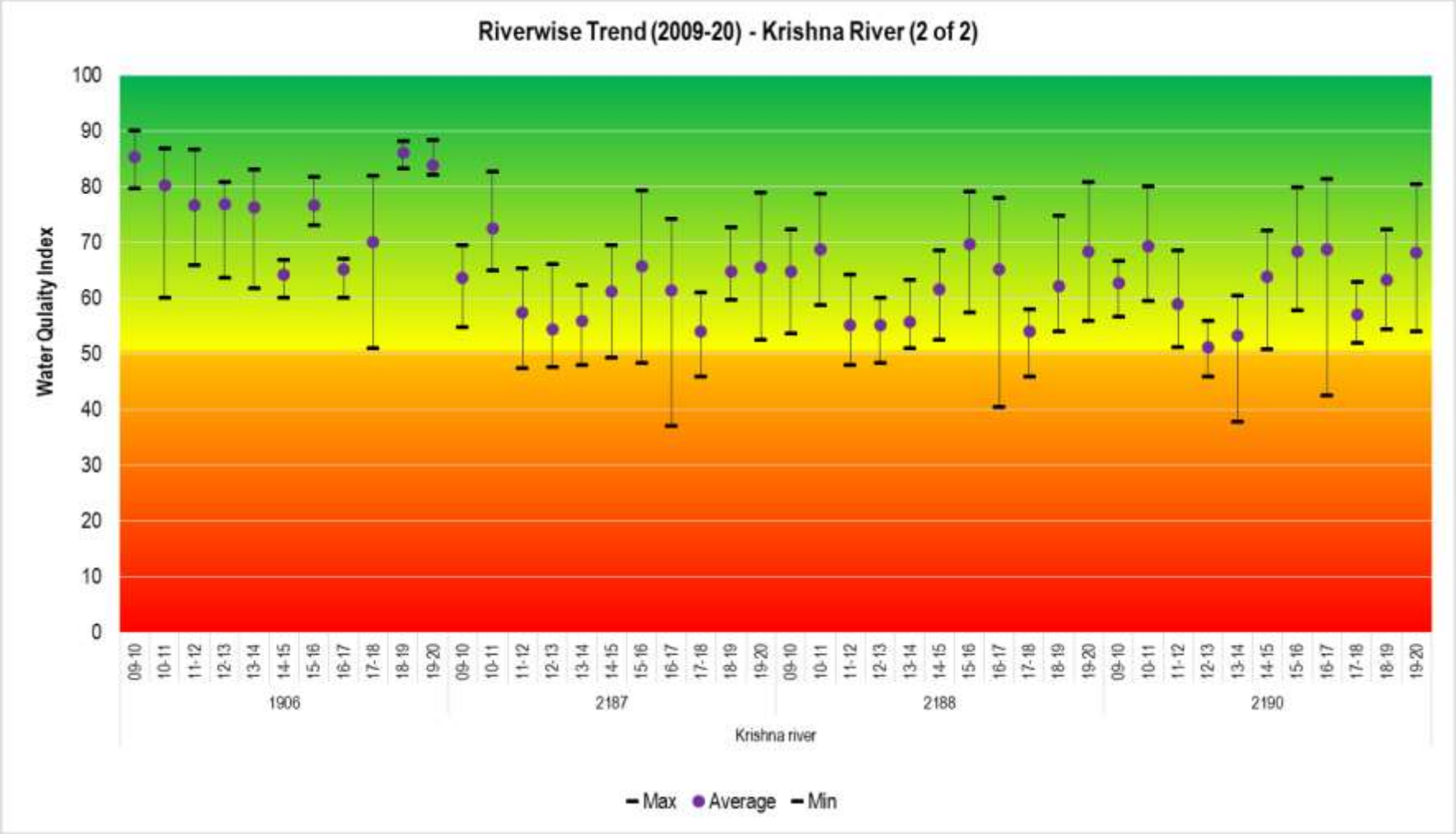
Note:* Stations are Dry/ No data available for respective year



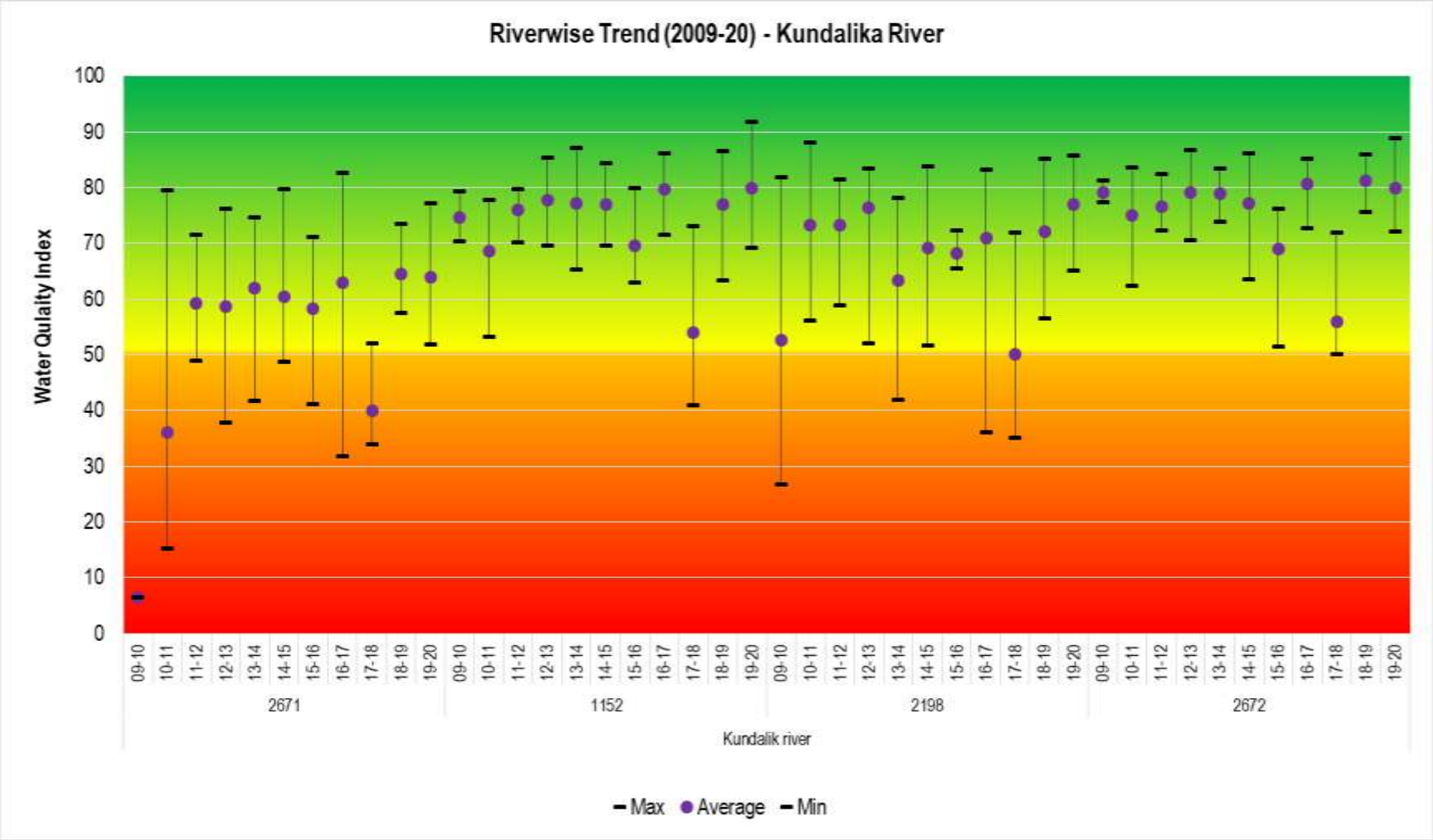
Note:* Stations are Dry/ No data available for respective year



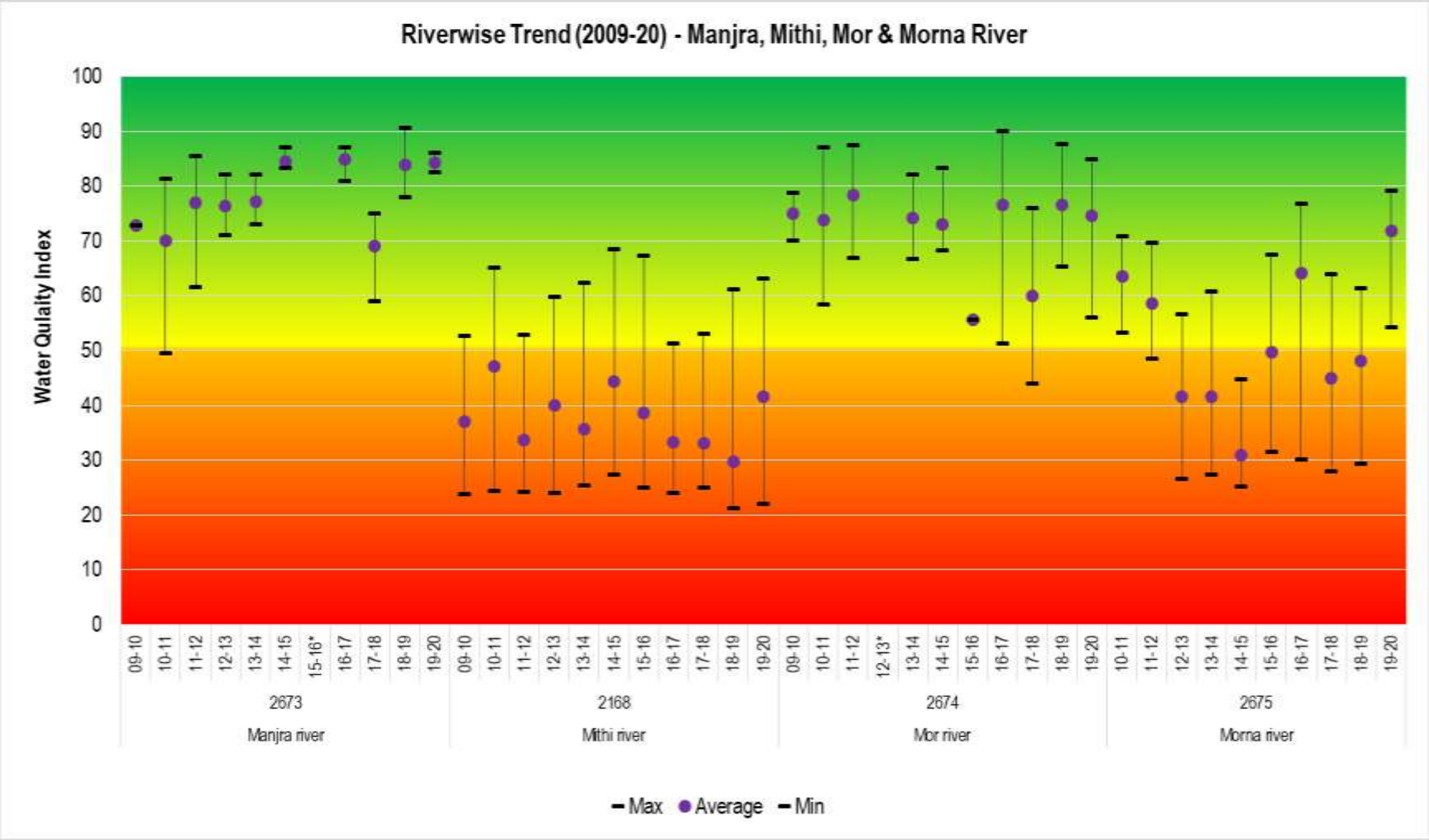
Note:* Stations are Dry/ No data available for respective year



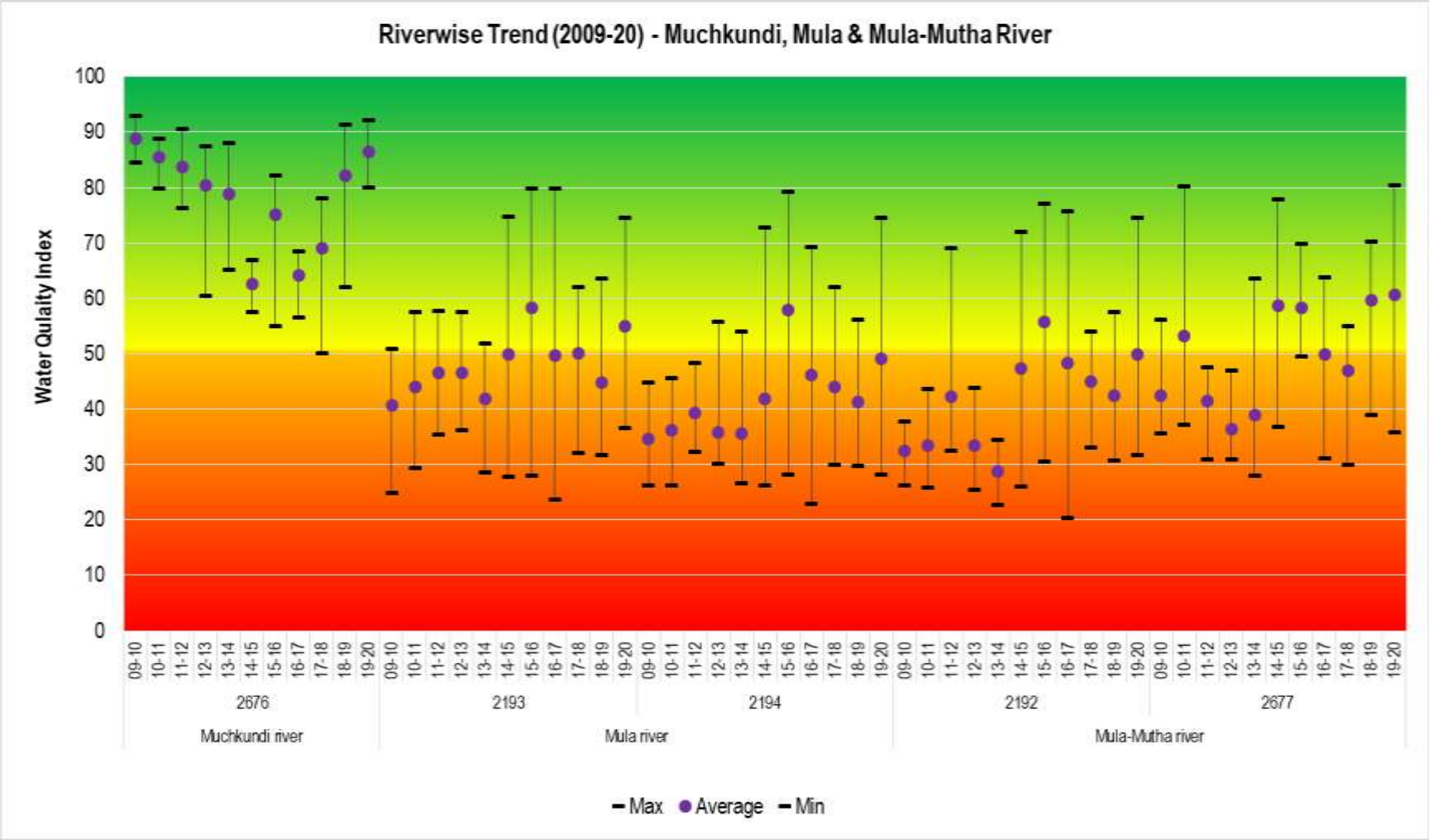
Note:* Stations are Dry/ No data available for respective year



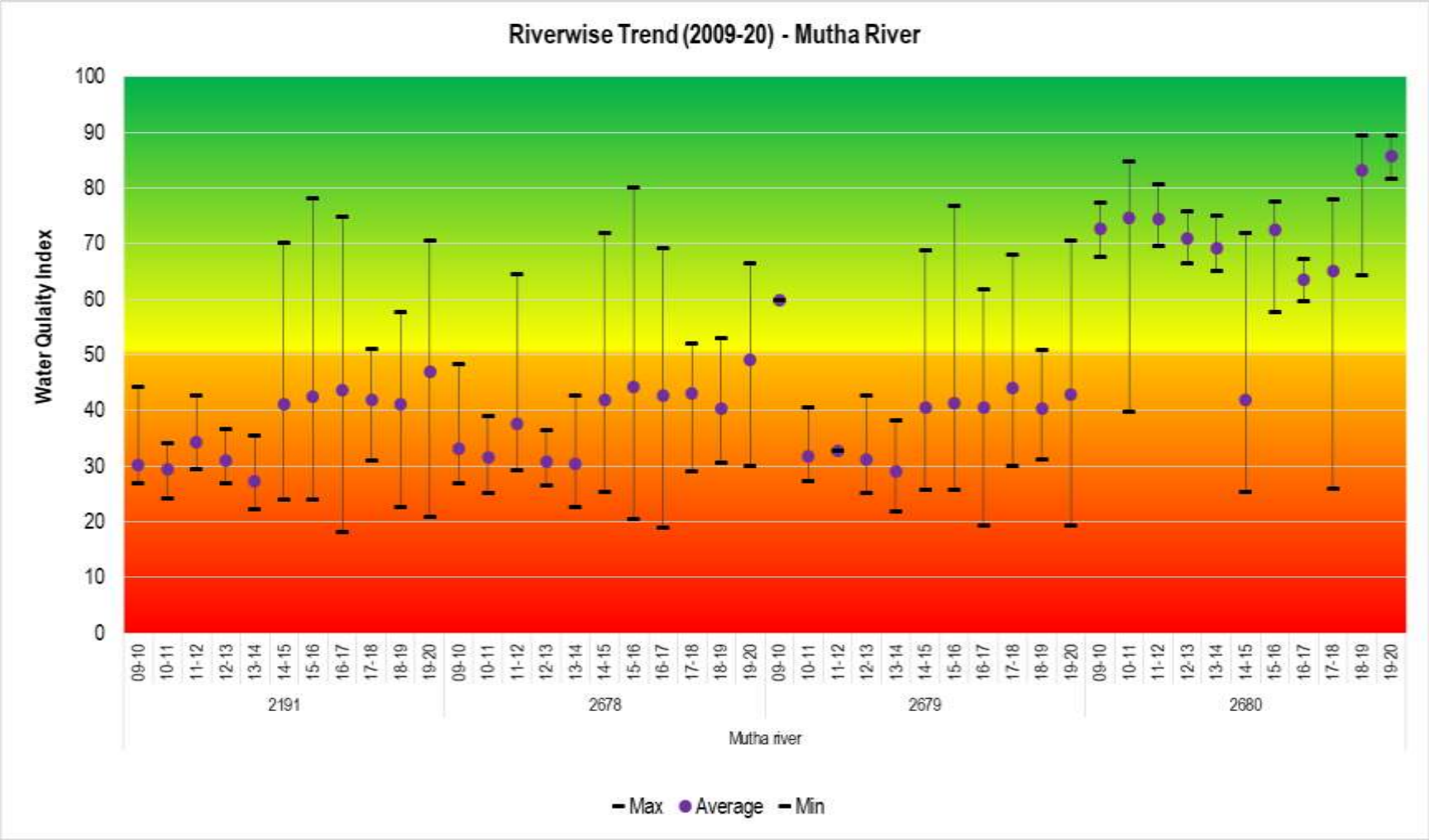
Note:* Stations are Dry/ No data available for respective year



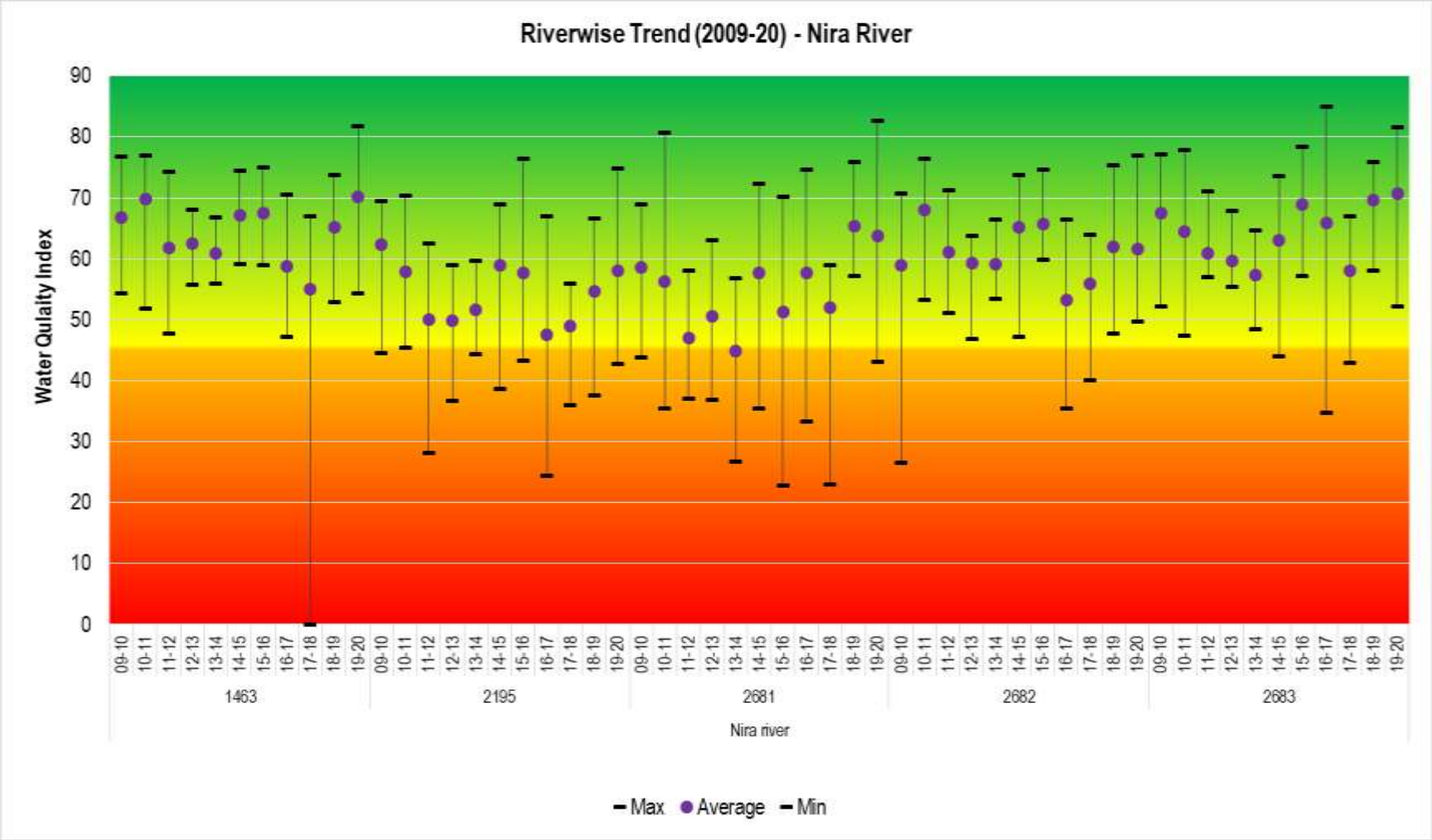
Note:* Stations are Dry/ No data available for respective year



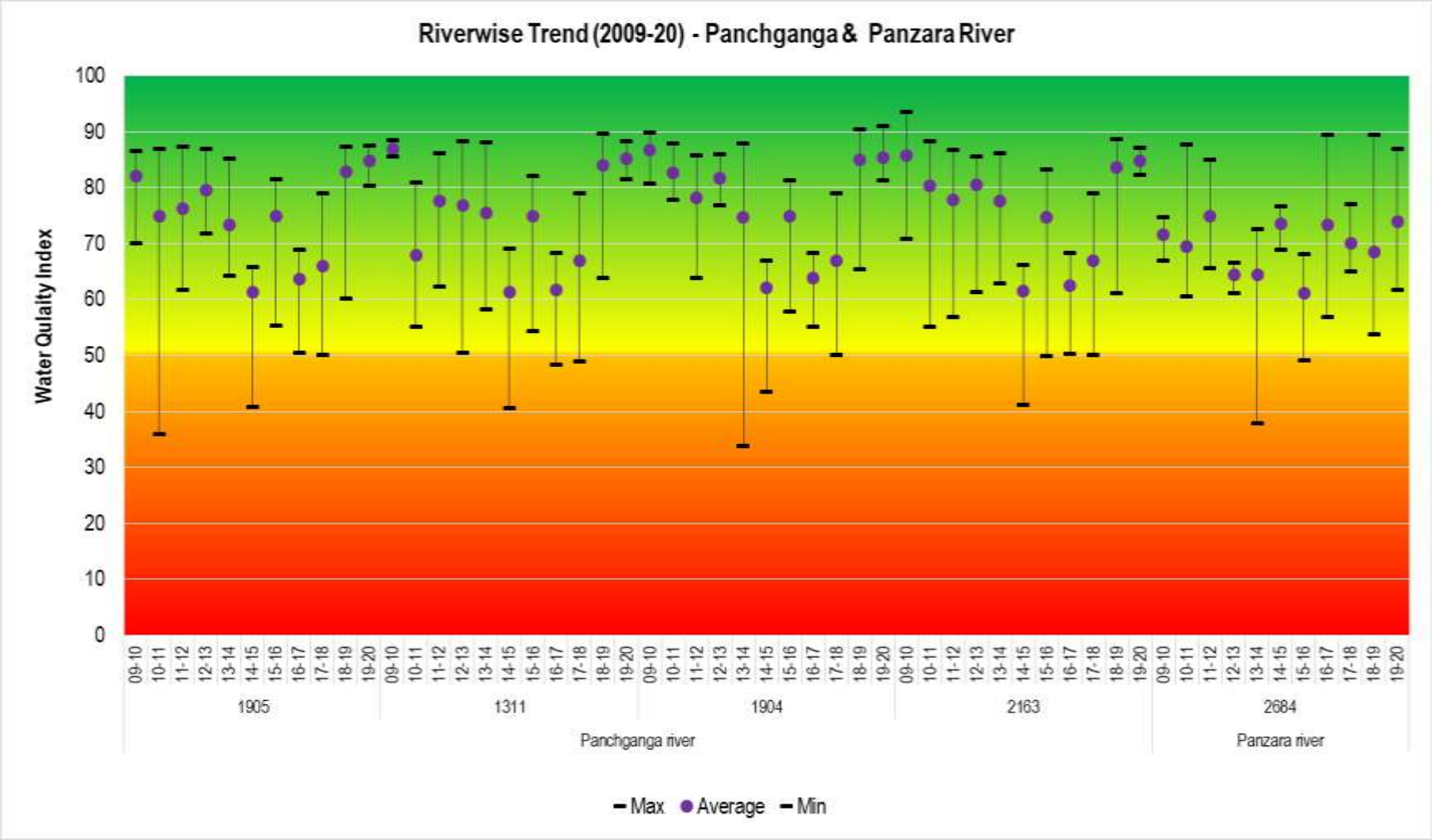
Note:* Stations are Dry/ No data available for respective year



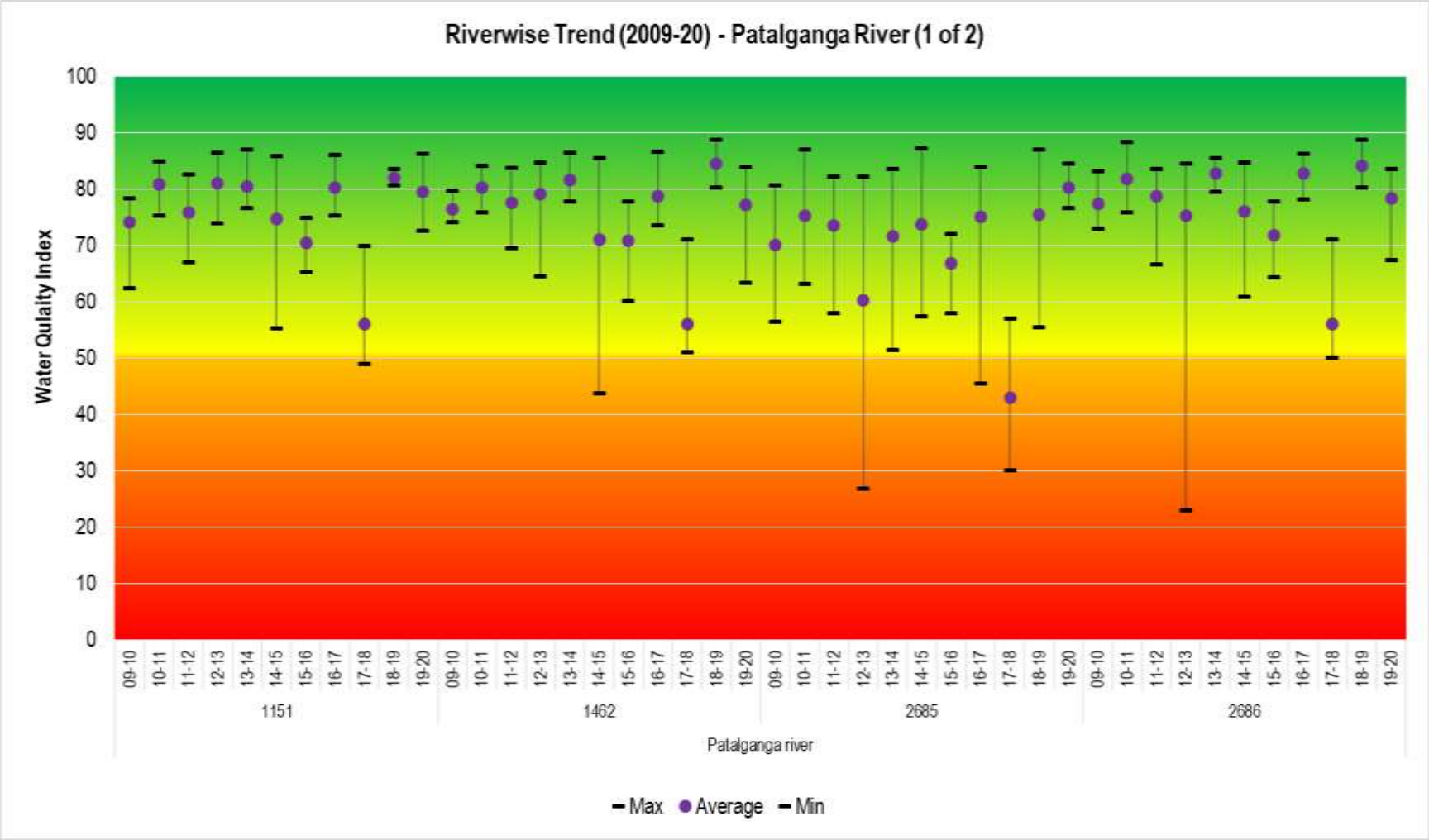
Note:* Stations are Dry/ No data available for respective year



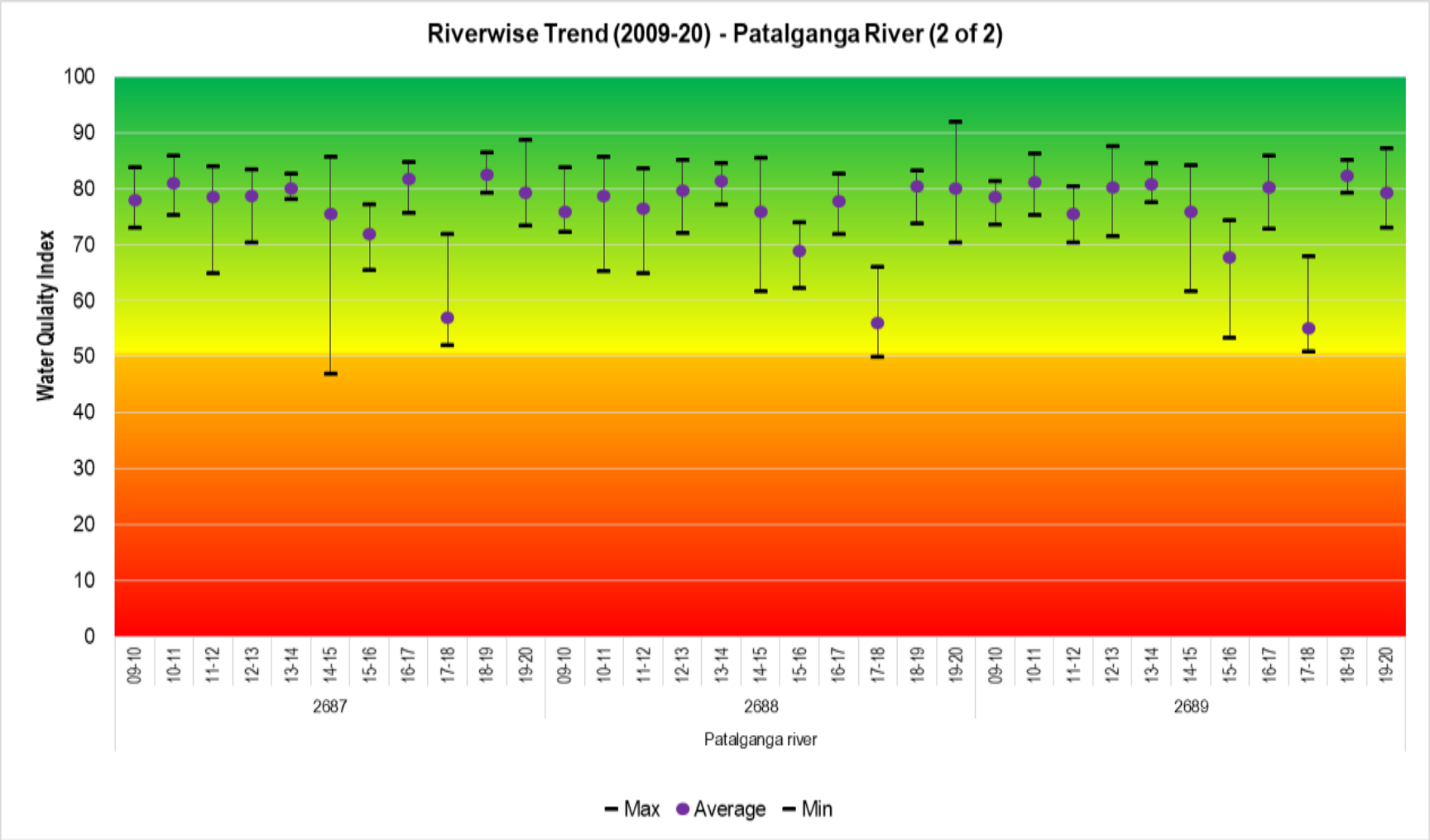
Note:* Stations are Dry/ No data available for respective year



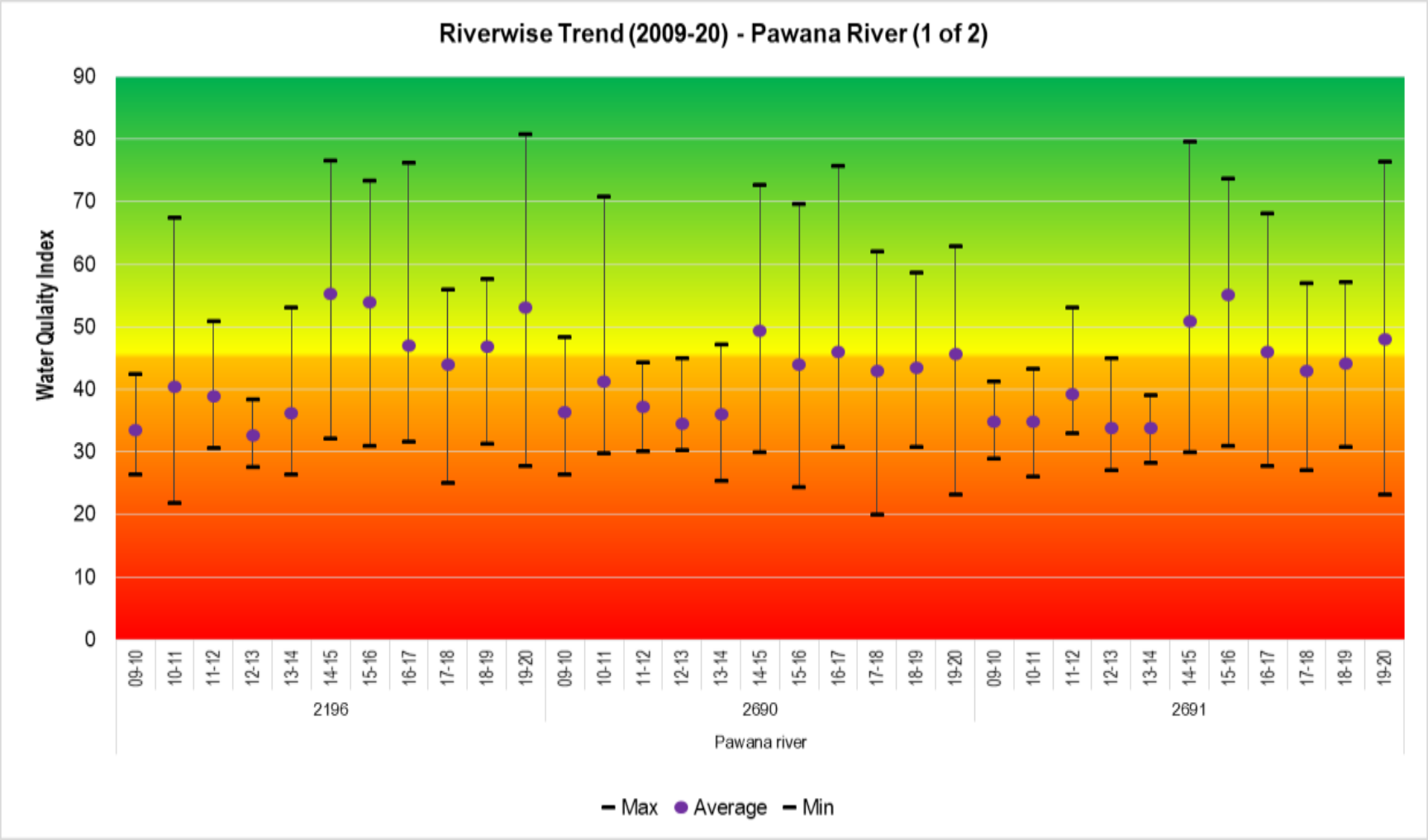
Note:* Stations are Dry/ No data available for respective year



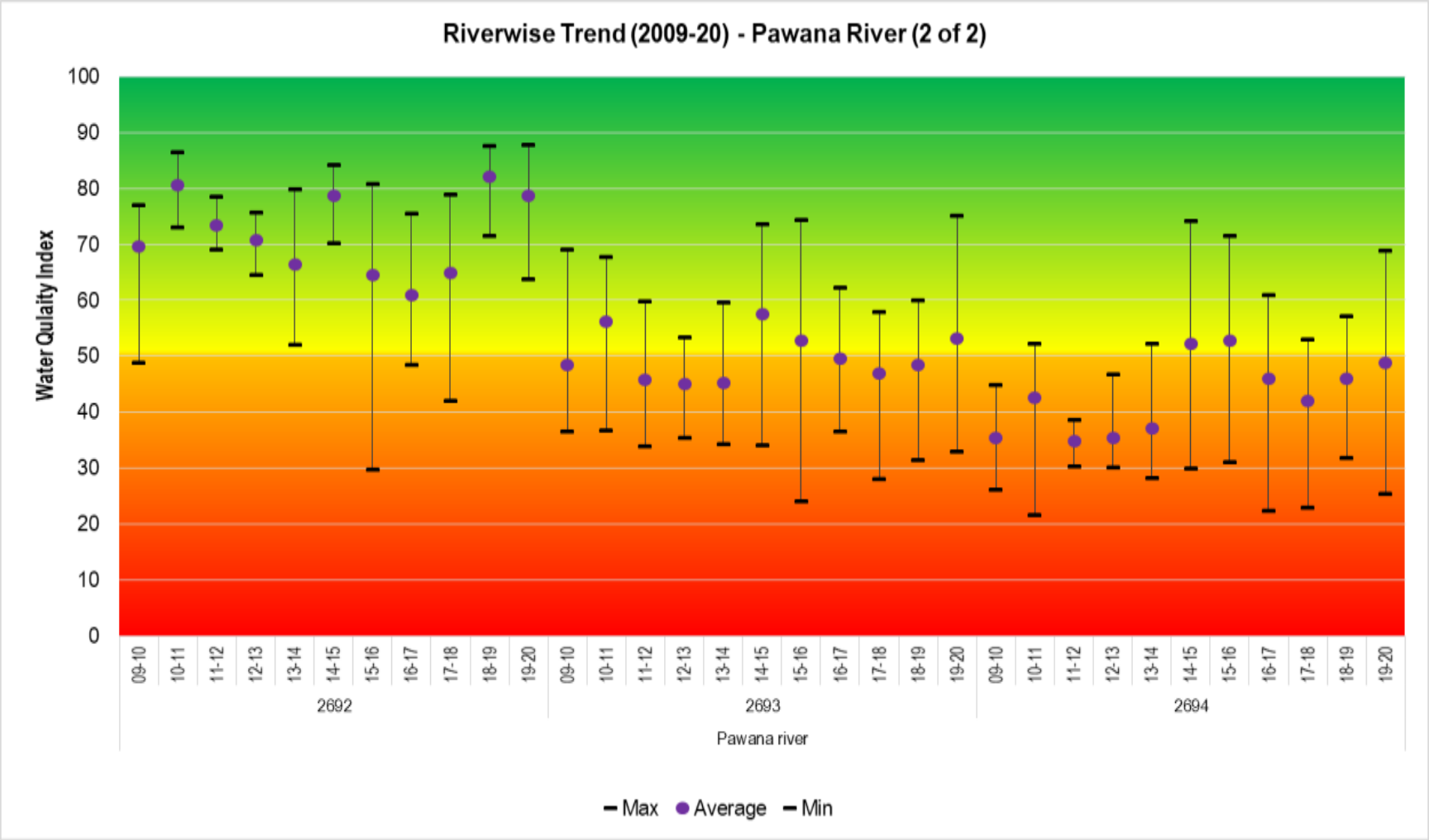
Note:* Stations are Dry/ No data available for respective year



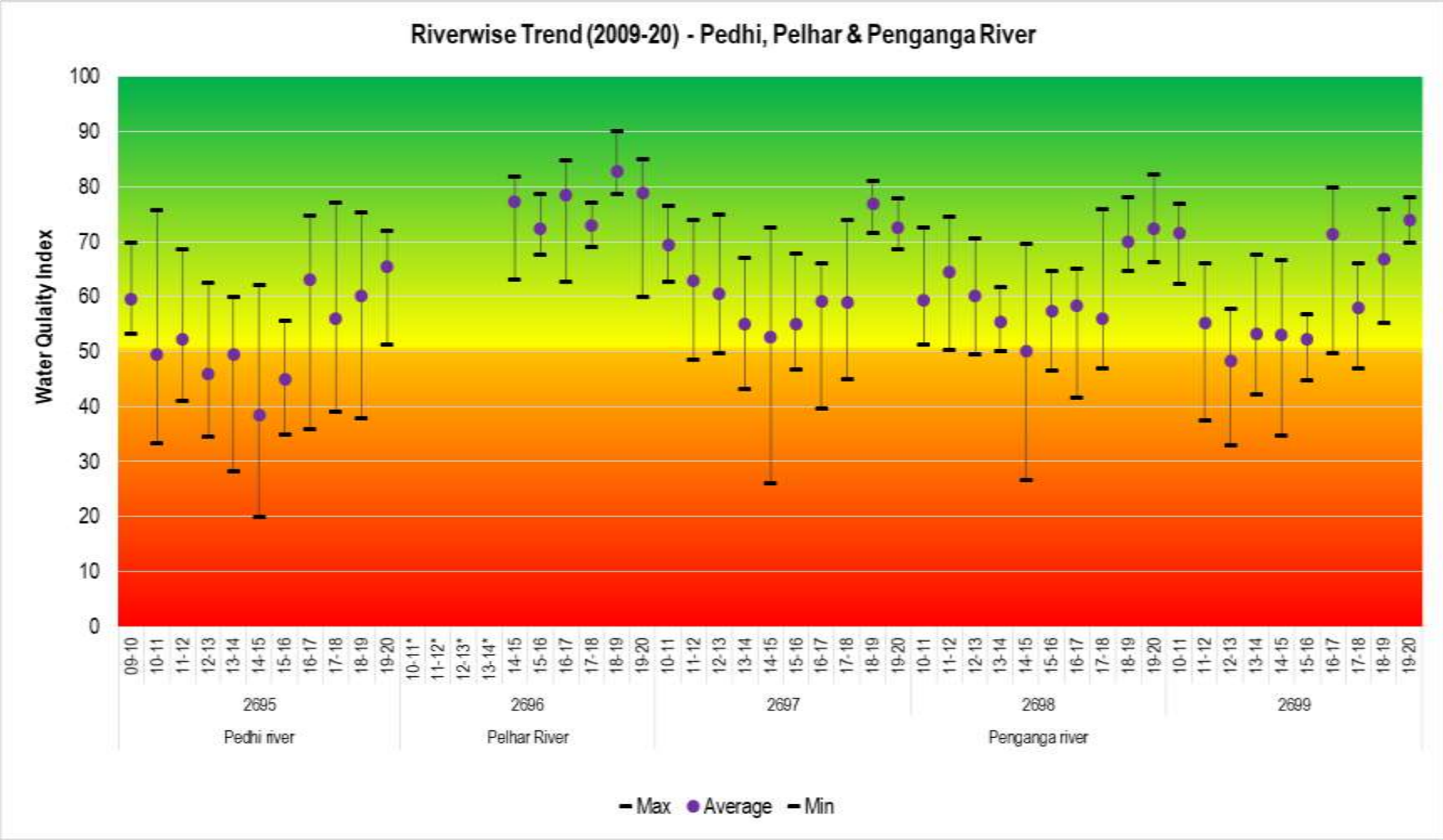
Note:* Stations are Dry/ No data available for respective year



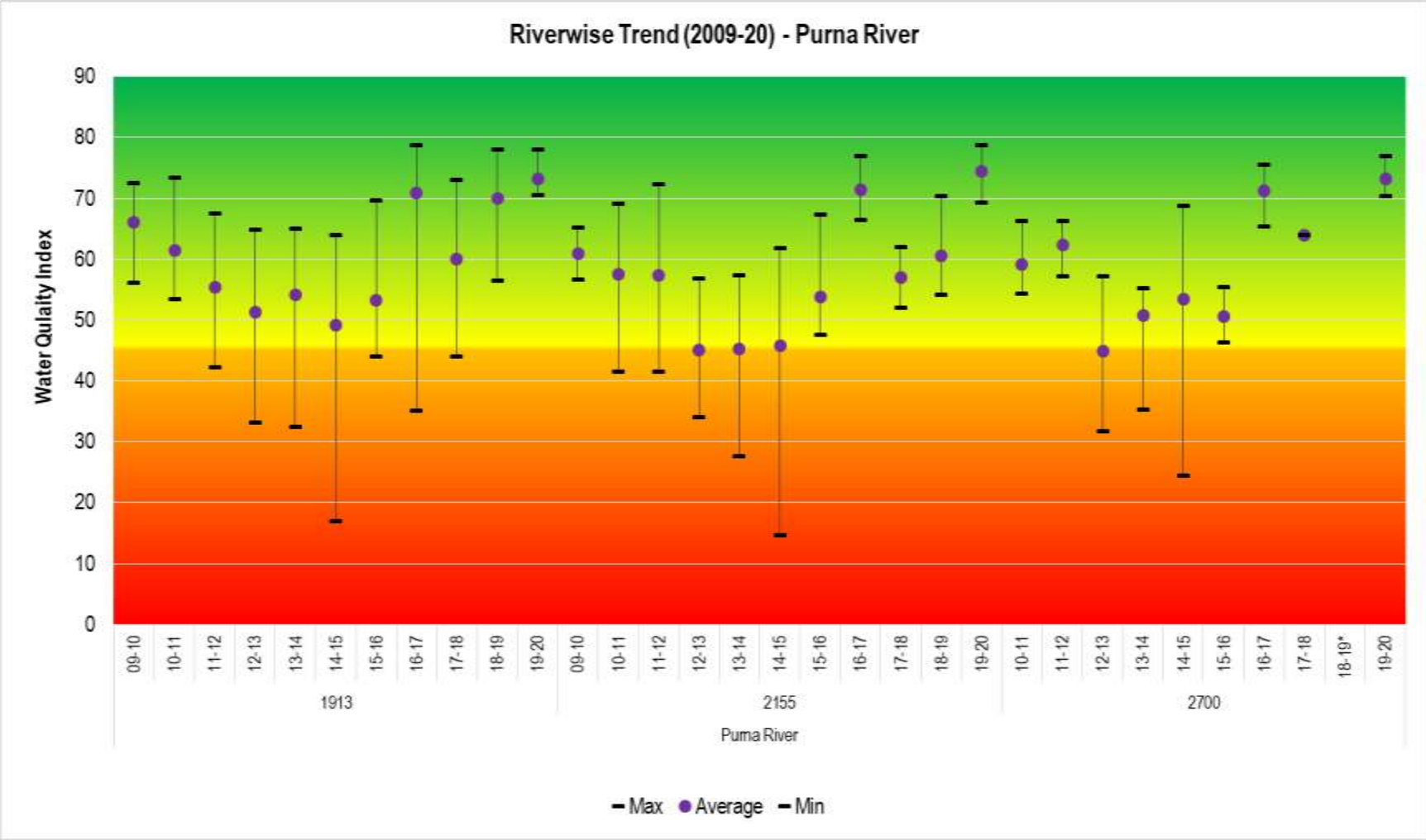
Note:* Stations are Dry/ No data available for respective year



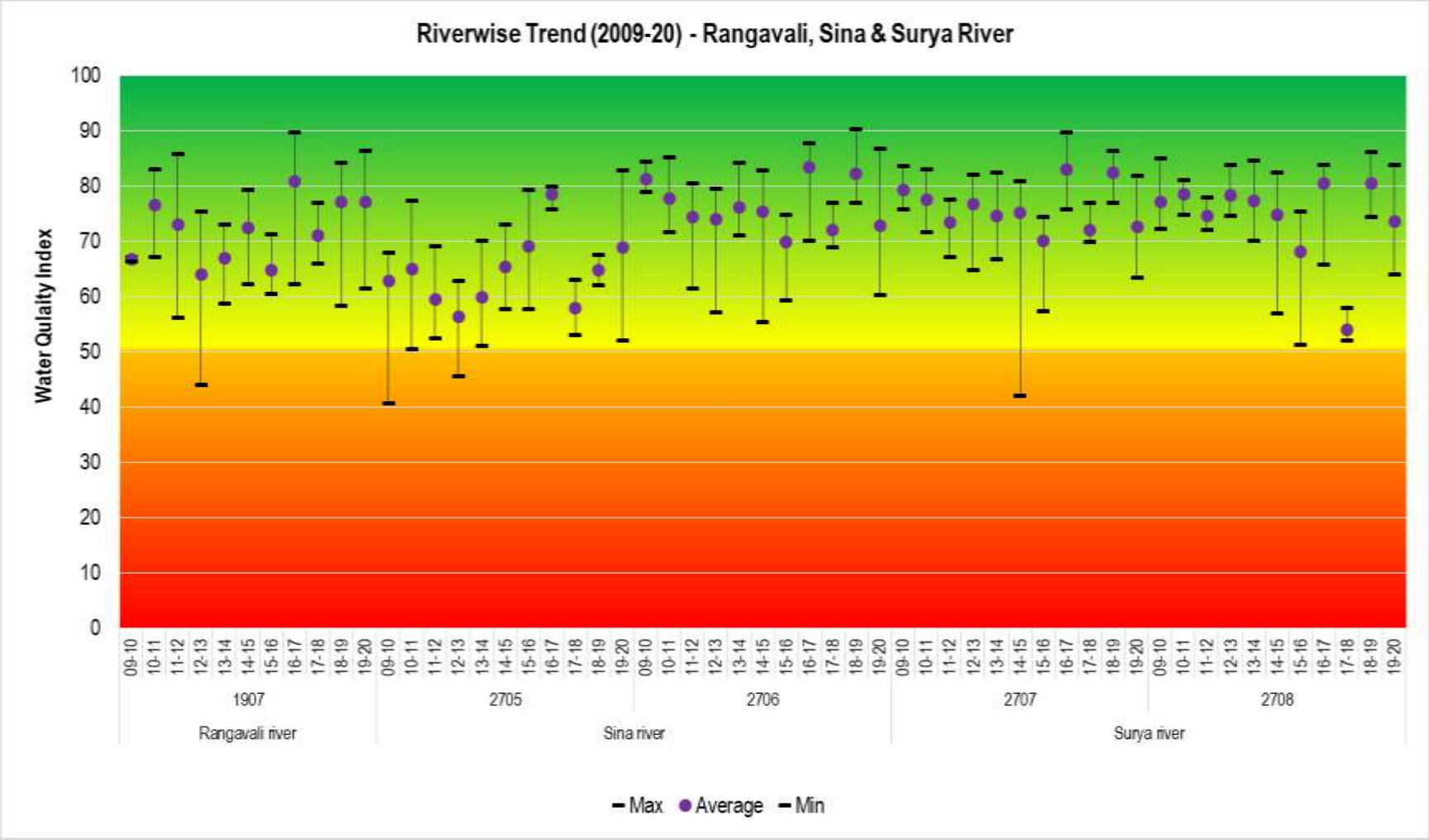
Note:* Stations are Dry/ No data available for respective year



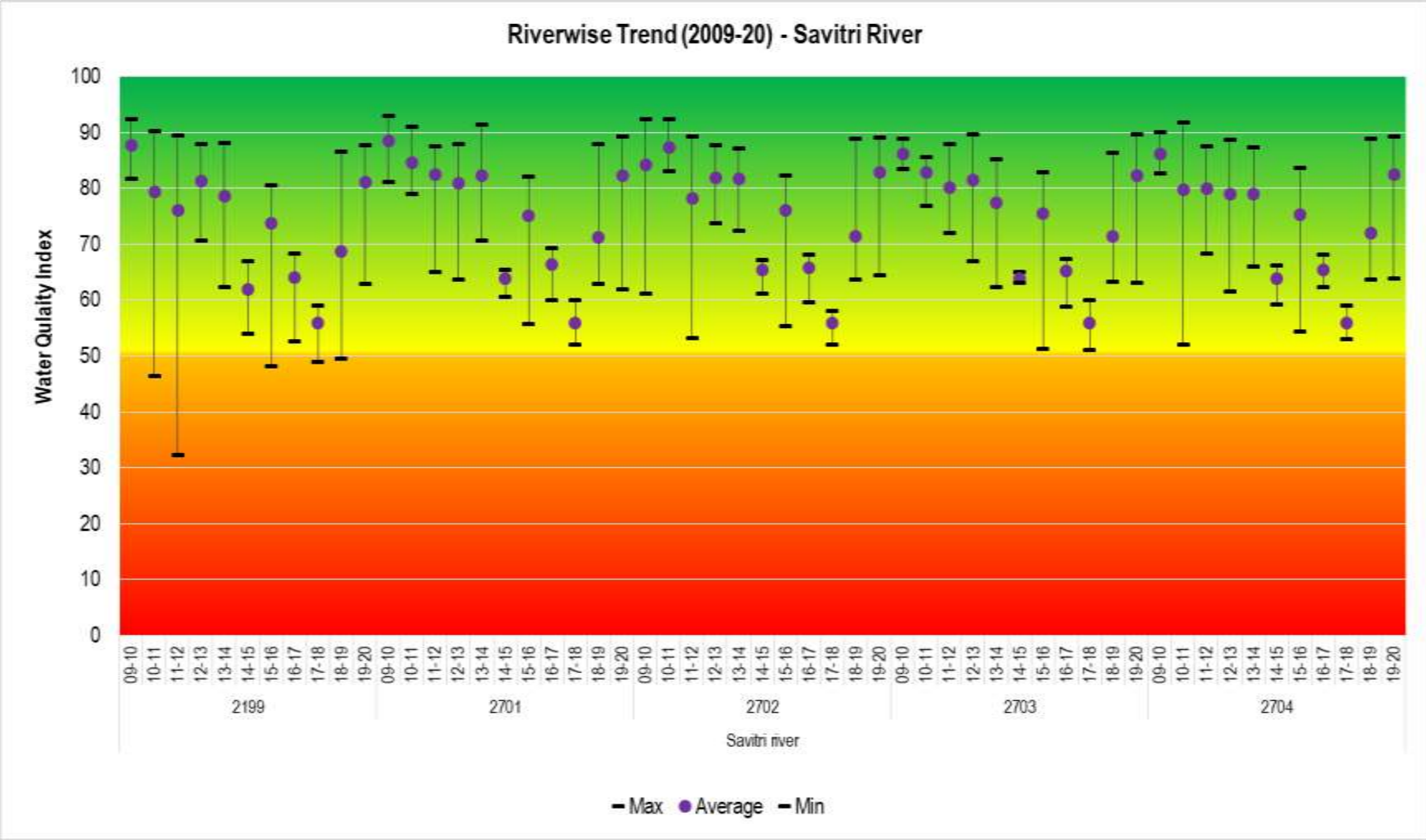
Note:* Stations are Dry/ No data available for respective year



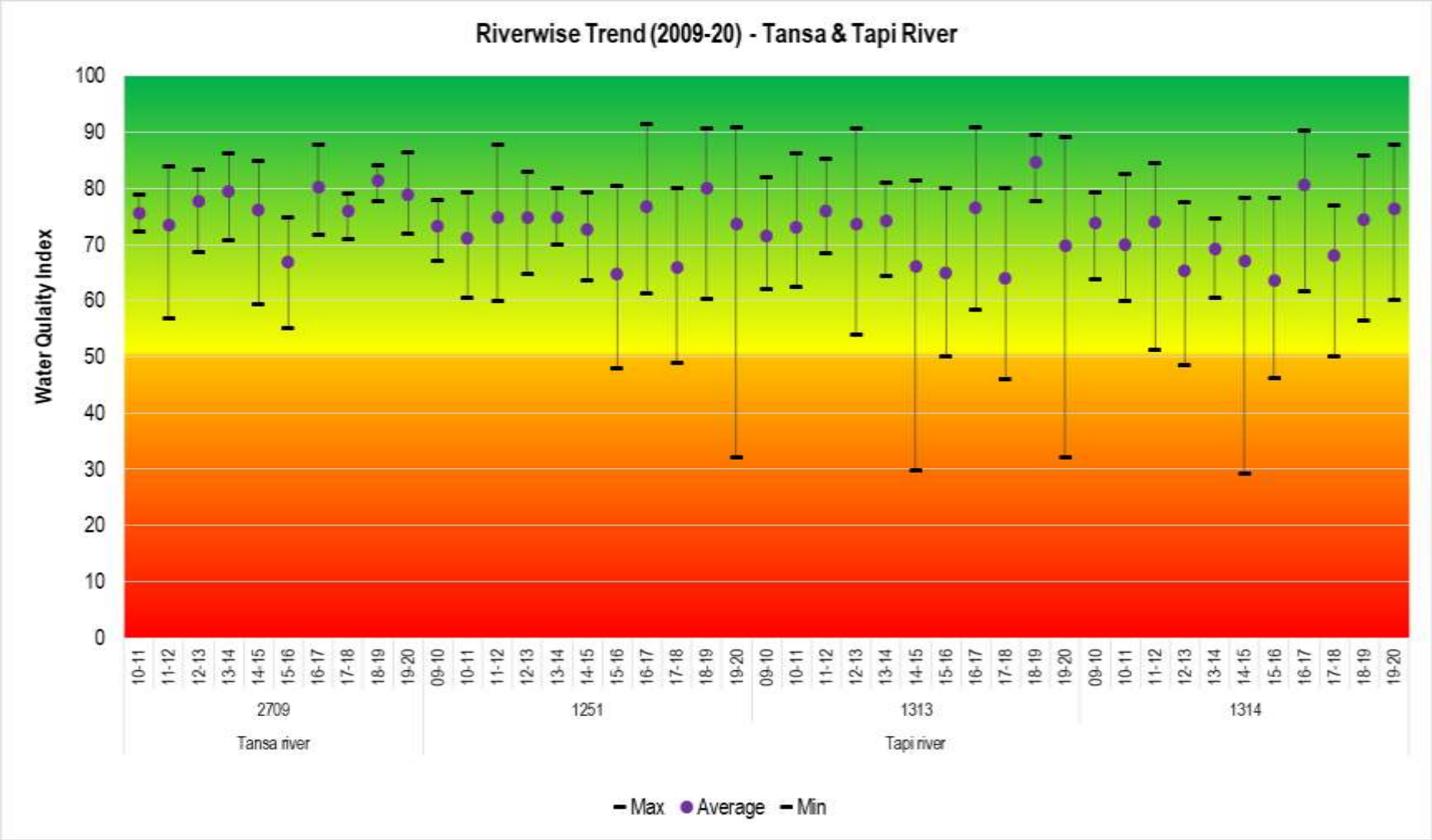
Note:* Stations are Dry/ No data available for respective year



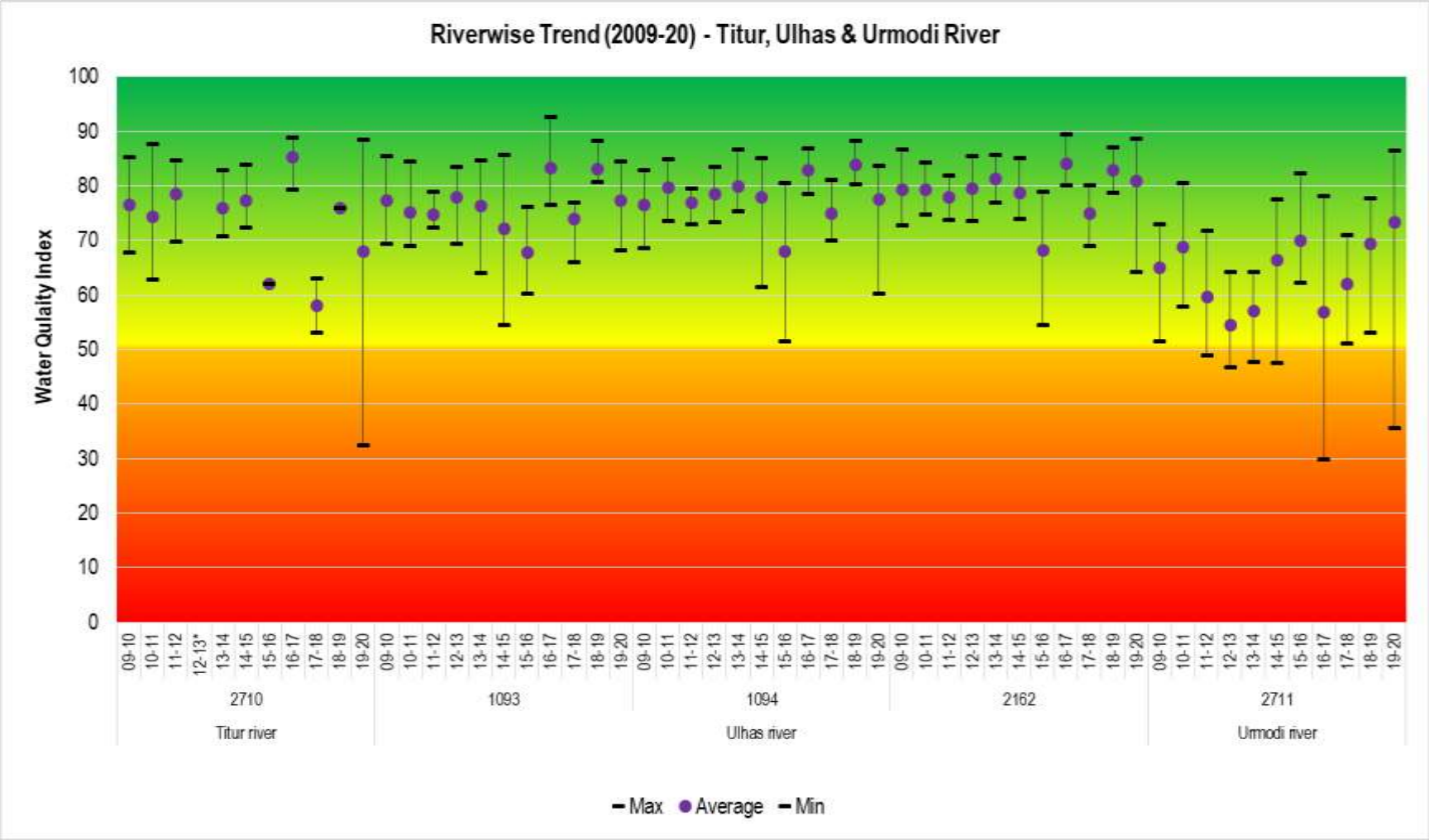
Note:* Stations are Dry/ No data available for respective year



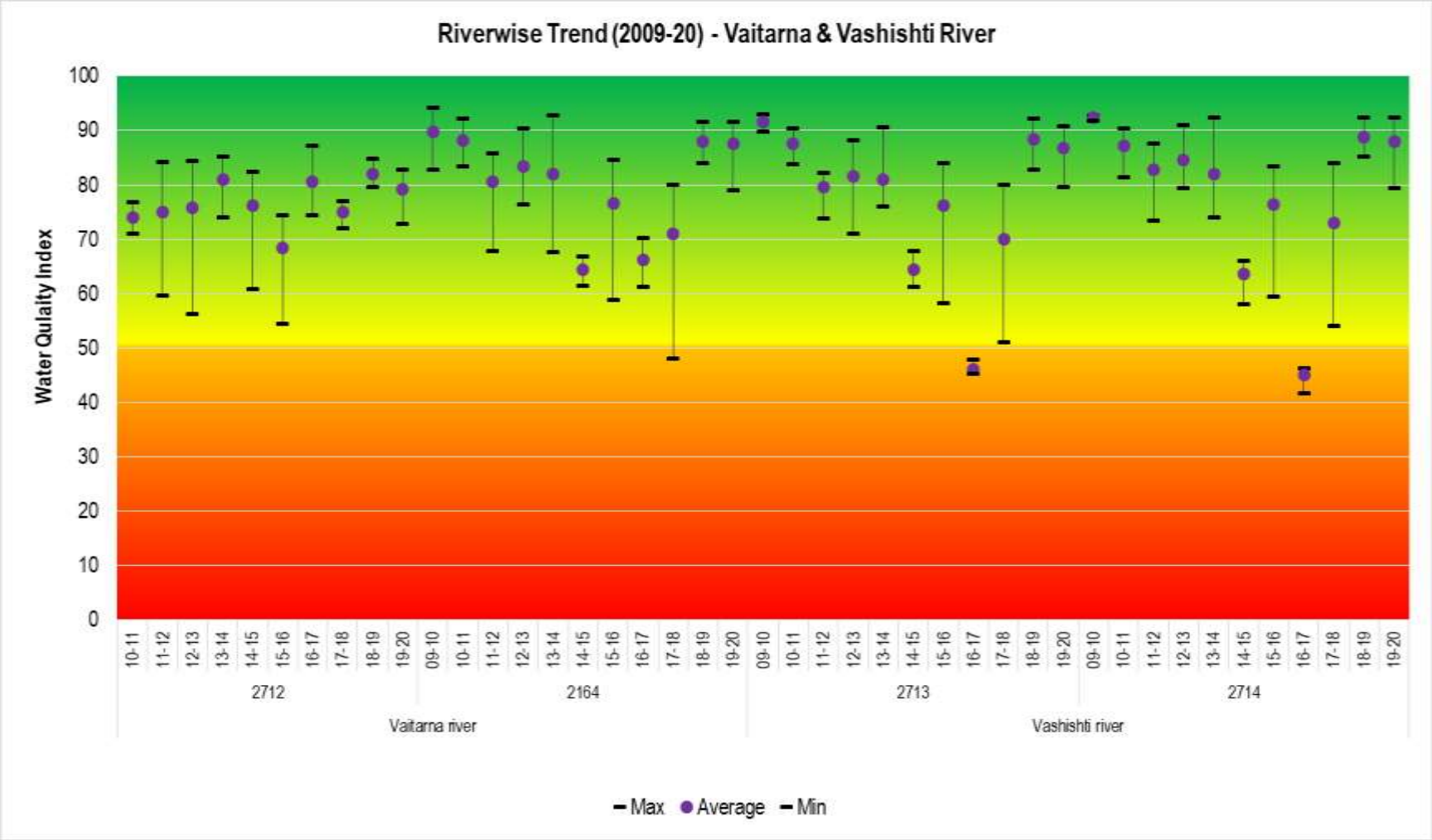
Note:* Stations are Dry/ No data available for respective year



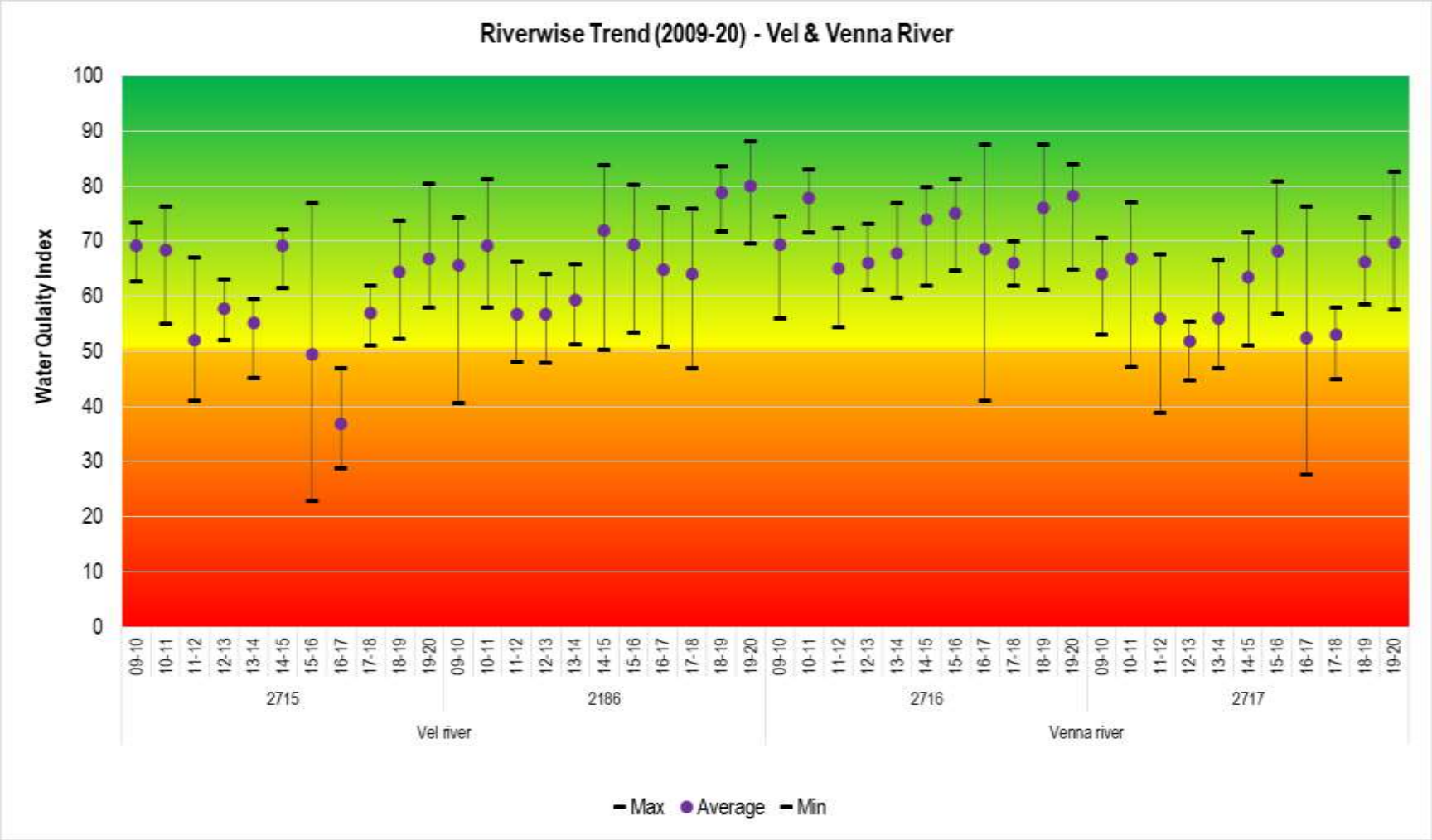
Note:* Stations are Dry/ No data available for respective year



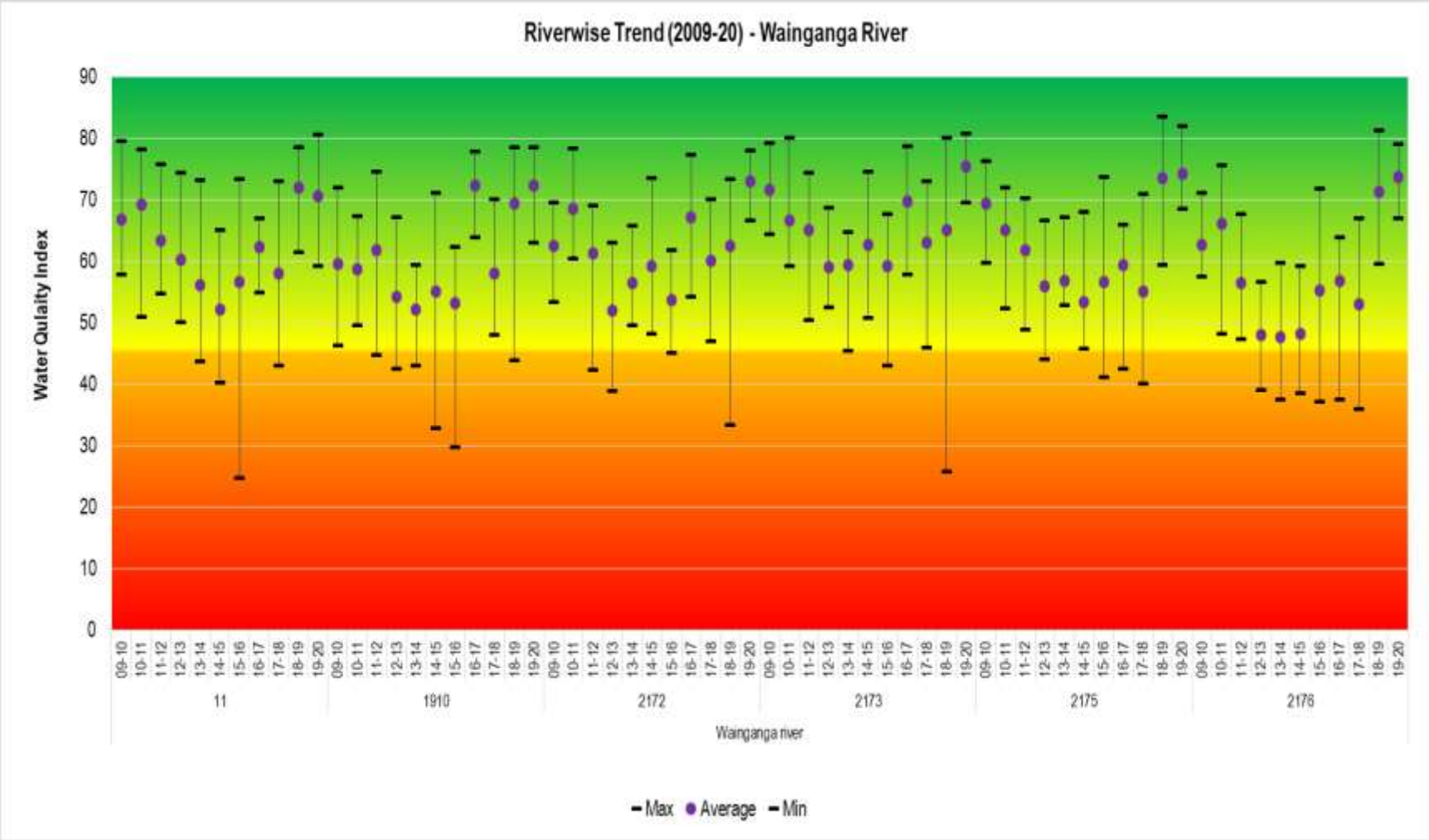
Note:* Stations are Dry/ No data available for respective year



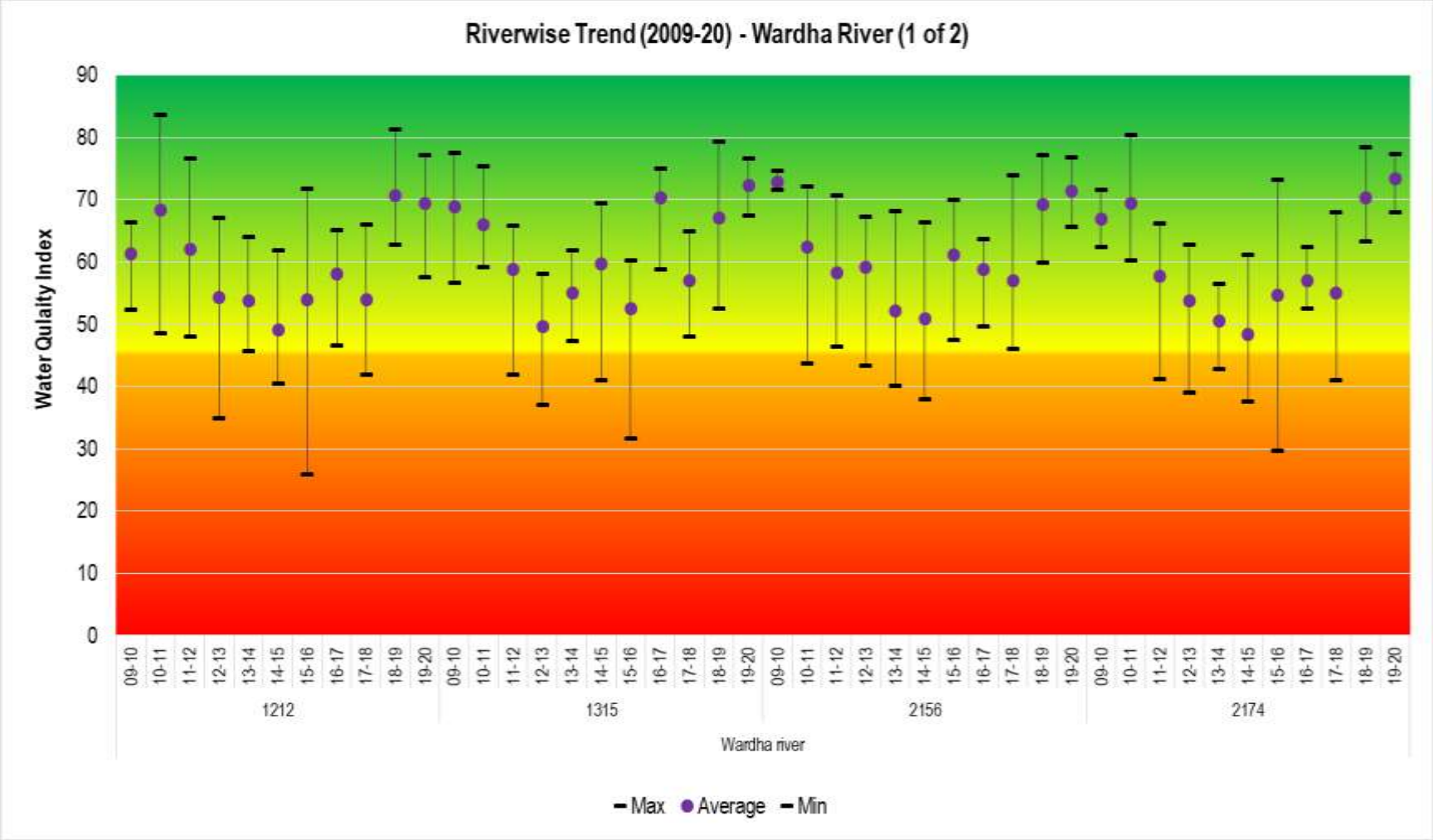
Note:* Stations are Dry/ No data available for respective year



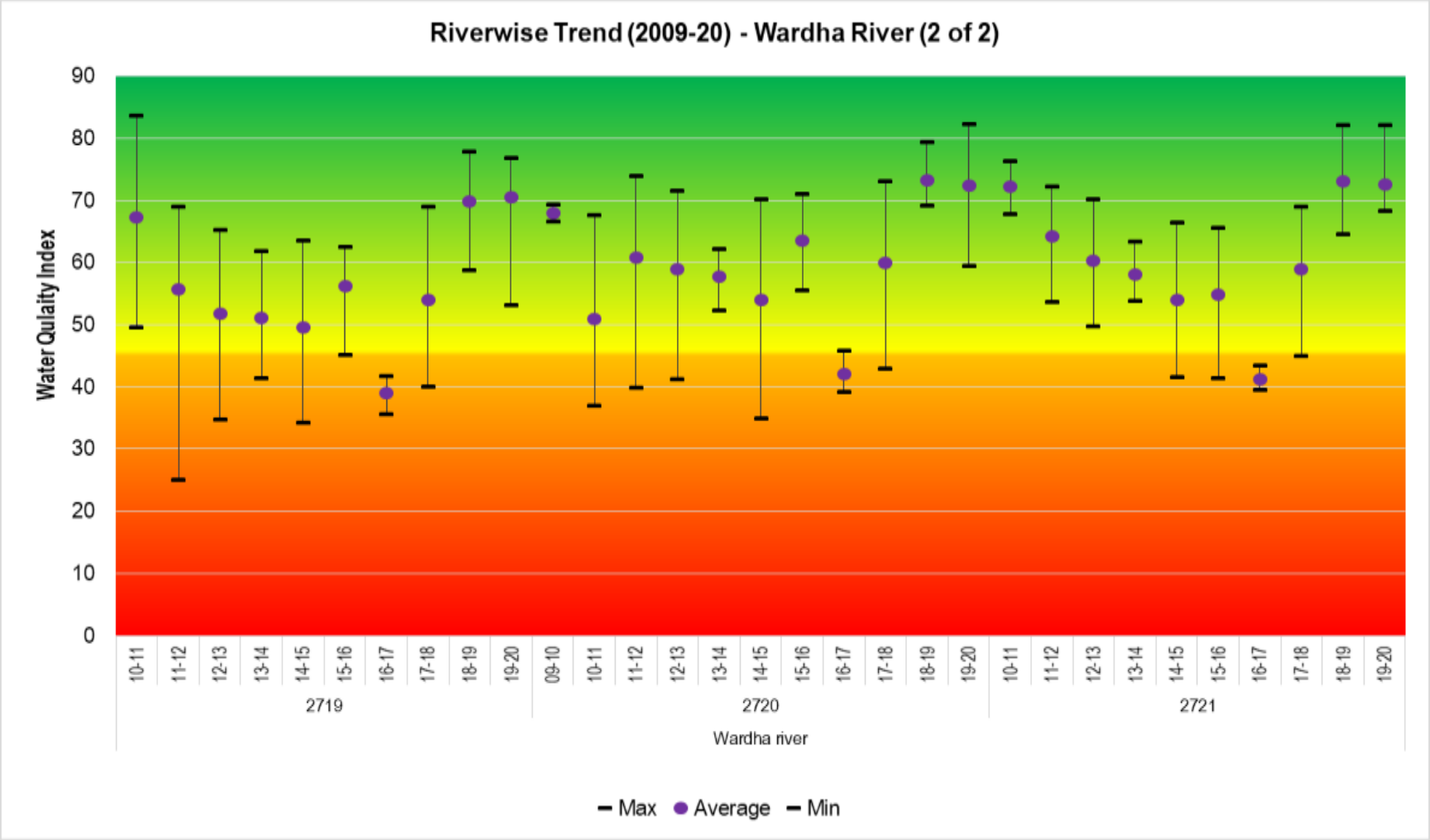
Note:* Stations are Dry/ No data available for respective year



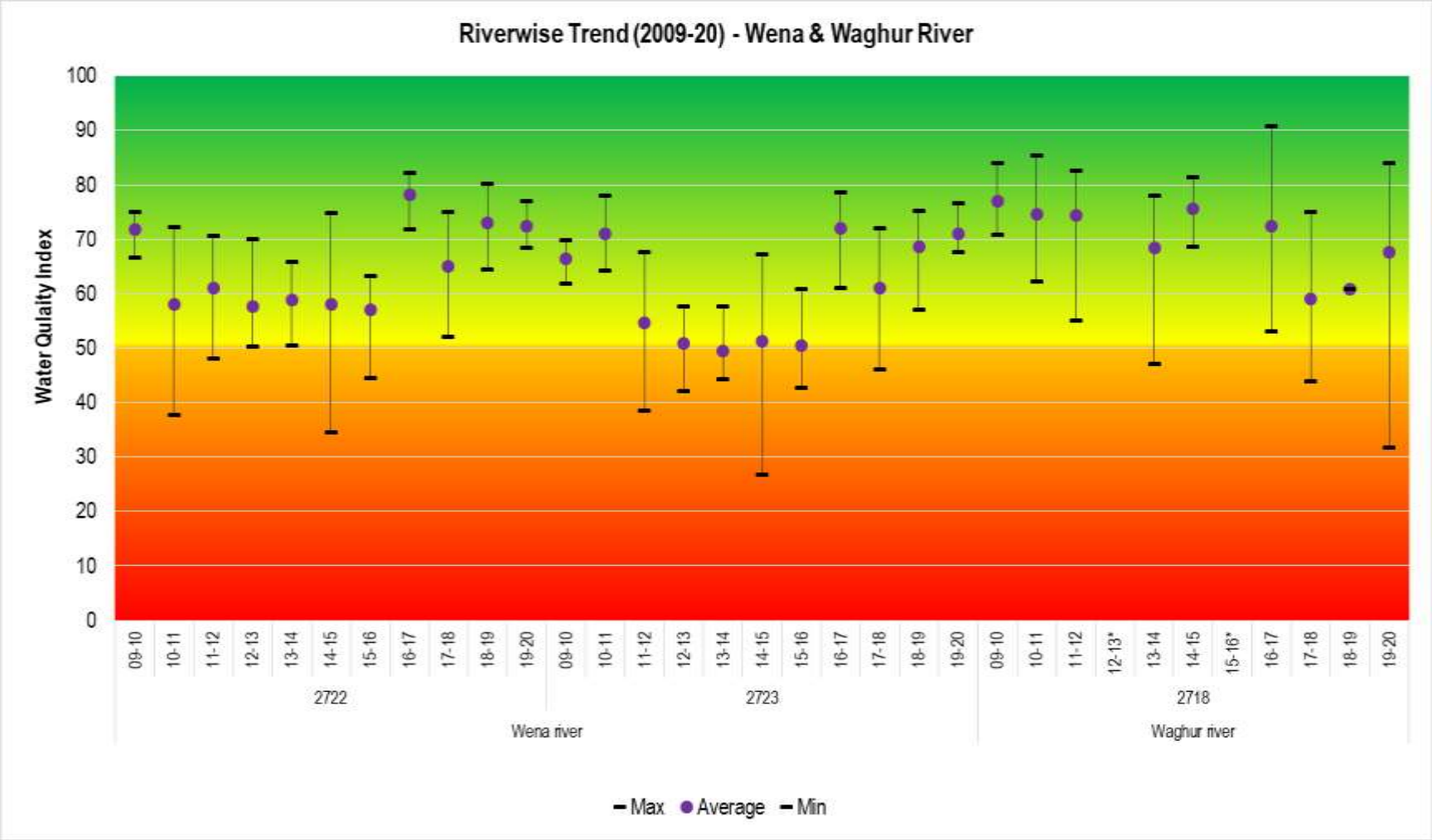
Note:* Stations are Dry/ No data available for respective year



Note:* Stations are Dry/ No data available for respective year



Note:* Stations are Dry/ No data available for respective year



Note:* Stations are Dry/ No data available for respective year

Stationwise Trend in WQI (2007-20)

Saline water

Raigad & Ratnagiri District

		Fiscal Year														
District	Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
Raigad	1317	57	56	59	59	49	50	55	57	48	52	45	56	57		No Significant Change	0.00
Raigad	2803		56		47	55	55	70	69	58	58	52	71	76		Quality Improved	2.43
Raigad	191									48	48	46	54	56		Quality Improved	1.15
Ratnagiri	2804					82	82	79	63	77	64	69	85	87		No Significant Change	0.43
Ratnagiri	2813	75	79	87	83	75	77	76	62	74	60	62	75	80		No Significant Change	0.48
Ratnagiri	2815	76	83	86	85	78	73	76	53	72	58	60	75	78		No Significant Change	0.27
Ratnagiri	2814	75	81	86	83	74	76	75	54	71	59	61	75	80		No Significant Change	0.48

CAGR: Compound Annual Growth Rate= ((End value/Start value) ^ (1/Number of intervals)) - 1
Number of intervals = (Number of observations)-1 *100

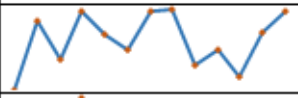
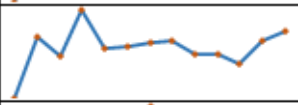
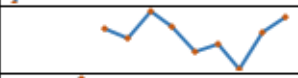
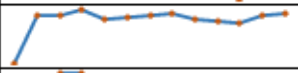
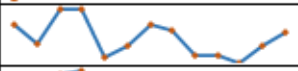
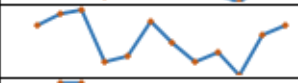
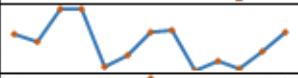
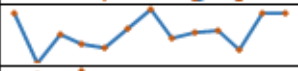
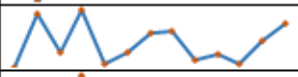
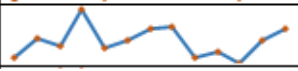
Calculation:

Example Station code: 2809
WQI of 2019-2020 (End value) : 55; WQI of 2007-08 (Start value) □41; Number of intervals□ 13

CAGR % = ((End value/Start Value) ^1/Number of intervals)) - 1 X 100

= ((55/41) ^ (1/13)-1 *100 = 2.26% = Quality Improved

Mumbai District

					Fiscal Year											
District	Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
Mumbai	2809	41	53	46	54	51	48	55	55	45	48	43	51	55		Quality Improved	2.26
Mumbai	2811	36	52	47	60	49	50	51	52	48	48	45	52	54		Quality Improved	3.24
Mumbai	2810					51	49	54	51	47	48	43	50	53		No Significant Change	0.35
Mumbai	2167	0	53	54	59	48	51	53	55	48	47	43	52	55		No Significant Change	0.29
Mumbai	2165	55	50	60	60	46	49	55	54	47	47	44	49	53		No Significant Change	-0.33
Mumbai	2169		54	57	58	45	46	55	50	45	47	41	52	54		No Significant Change	0.01
Mumbai	2166	54	52	60	60	46	49	54	55	45	47	45	50	54		No Significant Change	0.10
Mumbai	1318	53	44	49	48	47	51	54	49	50	50	46	54	53		No Significant Change	-0.01
Mumbai	2812	44	57	47	58	45	48	52	53	46	47	45	50	55		Quality Improved	1.69
Mumbai	2808	46	52	49	60	49	51	54	55	46	47	44	51	54		Quality Improved	1.35

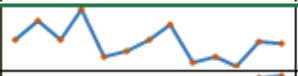
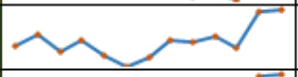
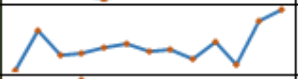
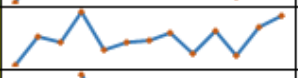
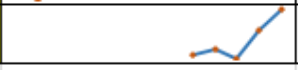
Note: For calculation of CAGR refer to Page No. 271

Thane District (1 of 2)

		Fiscal Year														
District	Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
Thane	2791	43	48	43	43	63	52	61	60	57	53	53	69	68		Quality Improved	3.59
Thane	2800	44	46	56	56	55	55	56	61	57	60	54	62	60		Quality Improved	2.37
Thane	2795	44	60	59	55	57	55	59	59	55	56	54	63	66		Quality Improved	3.08
Thane	2185	44	59	56	55	52	56	52	53	54	56	54	62	63		Quality Improved	2.77
Thane	2796	48	62	54	63	53	55	60	60	54	55	53	62	66		Quality Improved	2.40
Thane	2806	38	59	53	55	50	52	59	61	47	49	48	53	55		Quality Improved	2.98
Thane	2797	43	58	55	63	47	54	58	58	52	54	54	61	66		Quality Improved	3.32
Thane	2802	42	53	50	66	53	55	57	55	52	56	52	60	63		Quality Improved	3.05
Thane	2798	41	43		68	49	51	56	58	49	54	49	57	57		Quality Improved	2.62
Thane	2807	41	43		69	47	46	49	56	46	45	48	50	57		Quality Improved	2.59
Thane	2184	61	57	60	60	49	55	55	61	54	53	52	57	61		No Significant Change	0.03
Thane	1316	58	59	51	67	55	53	57	56	52	55	52	60	65		No Significant Change	0.93

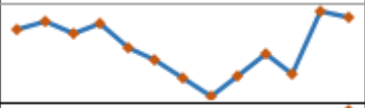
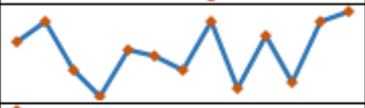
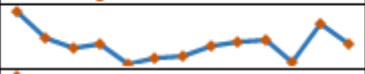
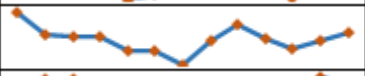
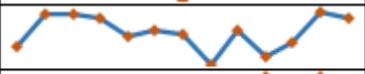
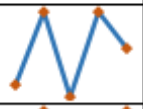
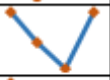
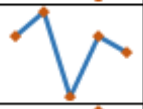
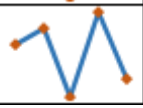
Note: For calculation of CAGR refer to Page No. 271

Thane Ditrict (2 of 2)

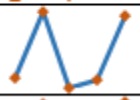
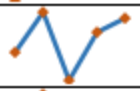
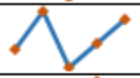
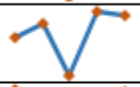
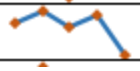
		Fiscal Year														
District	Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
Thane	2805	56	62	56	65	50	52	55	60	48	50	47	55	54		No Significant Change	-0.18
Thane	2793	53	57	52	55	50	47	50	55	54	56	53	64	64		Quality Improved	1.48
Thane	2792	55	63	60	54	51	55	56	57	54	55	54	64	65		Quality Improved	1.27
Thane	2794	52	61	55	55	57	58	56	56	54	58	53	63	65		Quality Improved	1.83
Thane	2801	49	57	56	64	54	56	56	58	52	59	52	60	63		Quality Improved	1.85
Thane	2799	52	42		72	51	52	53	55	49	52	48	55	58		No Significant Change	0.81
Thane	190									52	53	51	57	62		Quality Improved	1.42

Note: For calculation of CAGR refer to Page No. 271

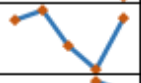
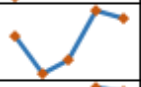
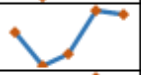
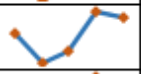
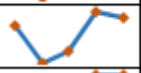
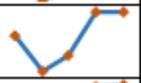
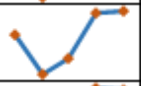
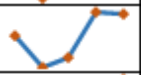
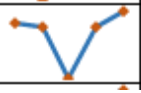
Surface water

Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
11	68	70	67	69	63	61	56	52	57	62	57	72	70		No Significant Change	0.35
12	80	84	75	70	79	78	75	84	71	81	73	84	86		No Significant Change	0.59
28	80	68	63	65	55	58	59	63	65	67	56	75	65		Quality Deteriorate	-1.76
36	81	68	66	67	59	58	51	65	73	66	60	64	69		Quality Deteriorate	-1.34
37	70	86	86	84	76	78	76	62	78	66	72	87	84		Quality Improved	1.47
178									68	82	66	82	75		No Significant Change	0.84
179										81	38	Dry	82		No Significant Change	0.06
180									60	67	42	60	55		No Significant Change	-0.69
181									62	65	53	67	56		No Significant Change	-0.82

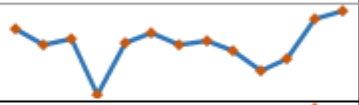
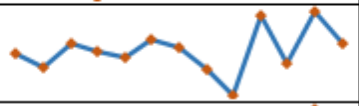
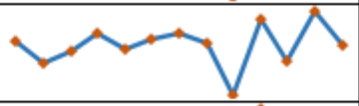
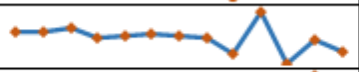
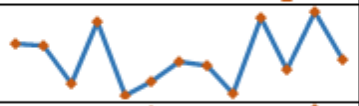
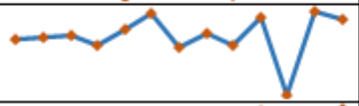
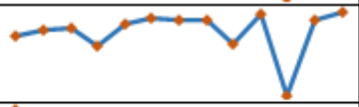
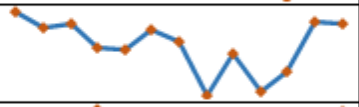
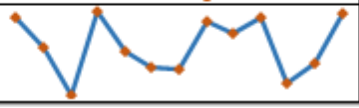
Note: For calculation of CAGR refer to Page No. 271

Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
182									63	68	40	65	62		No Significant Change	-0.07
183									58	76	58	73	68		Quality Improved	1.45
184									66	81	64	66	80		Quality Improved	1.57
185									51	71	60	66	71		Quality Improved	2.85
186									32	38	28	35	37		Quality Improved	1.21
187									33	40	30	34	38		Quality Improved	1.24
188									38	41	29	44	43		Quality Improved	1.19
189									47	45	31	42	47		No Significant	-0.15
192									72	83	55	80	80		No Significant	0.90
193									71	81	56	80	82		Quality Improved	1.14
194									62	88	55	79	Dry		Quality Improved	2.05

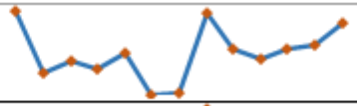
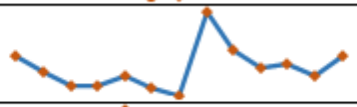
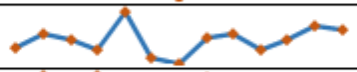
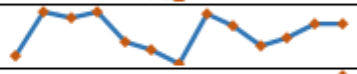
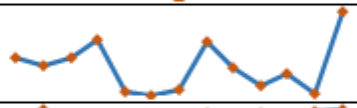
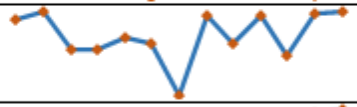
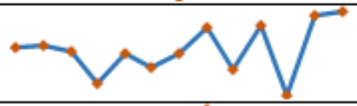
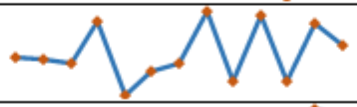
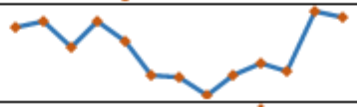
Note: For calculation of CAGR refer to Page No. 271

Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
195									48	60	44	46	29		Quality Deteriorated	-4.24
196									59	65	45	32	61		No Significant Change	0.25
197									50	54	54	63	61		Quality Improved	1.69
198									78	64	69	87	84		No Significant Change	0.71
199									78	64	69	87	85		No Significant Change	0.74
200									77	64	69	87	84		No Significant Change	0.75
201									79	65	69	84	82		No Significant Change	0.29
202									79	65	71	87	88		No Significant Change	0.88
203									79	66	71	86	87		No Significant Change	0.78
204									78	65	70	88	87		No Significant Change	0.93
216									65	62	34	62	72		No Significant Change	0.79

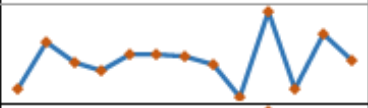
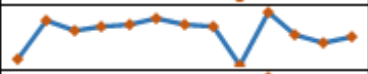
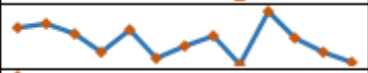
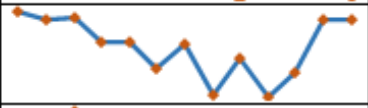
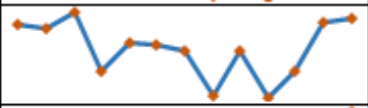
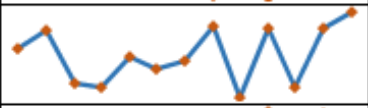
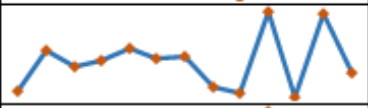
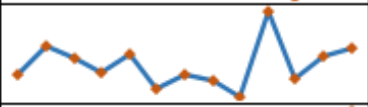
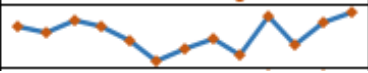
Note: For calculation of CAGR refer to Page No. 271

Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
1092	72	65	68	45	66	70	65	67	63	54	60	75	79		No Significant Change	0.77
1093	76	73	77	76	75	78	76	72	68	82	74	83	77		No Significant Change	0.19
1094	78	74	76	80	77	79	80	78	68	82	74	84	77		No Significant Change	-0.09
1095	78	79	81	76	77	77	77	76	69	88	64	75	69		Quality Deteriorate	-1.06
1096	74	74	66	79	63	66	70	69	63	80	68	82	71		No Significant Change	-0.41
1151	73	74	74	71	76	81	70	75	71	80	55	82	80		No Significant Change	0.76
1152	72	74	75	69	76	78	77	77	70	79	53	77	80		No Significant Change	0.84
1153	87	82	84	76	76	81	78	63	75	63	69	84	83		No Significant Change	-0.34
1188	67	62	55	68	62	59	59	67	65	67	57	60	68		No Significant Change	0.04

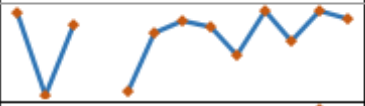
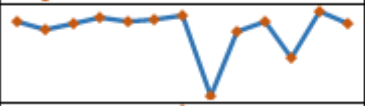
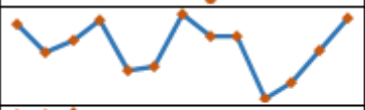
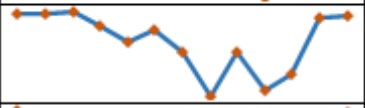
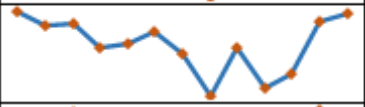
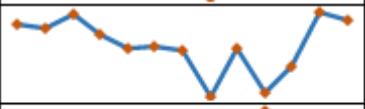
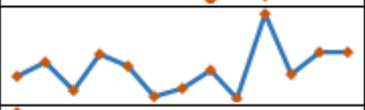
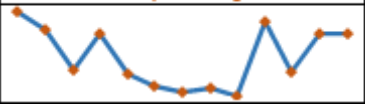
Note: For calculation of CAGR refer to Page No. 271

Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
1189	55	42	44	43	46	37	37	54	47	45	47	48	52		No Significant Change	-0.36
1190	48	41	34	34	39	33	30	70	52	43	45	39	49		No Significant Change	0.13
1191	54	64	60	52	81	47	42	61	64	52	59	70	67		Quality Improved	1.80
1192	43	71	67	71	52	47	39	70	62	49	55	63	63		Quality Improved	3.26
1194	76	74	75	79	70	69	70	78	74	70	73	69	83		No Significant Change	0.76
1209	82	84	73	73	77	75	61	83	75	83	72	84	84		No Significant Change	0.23
1210	80	80	80	74	79	77	79	83	76	84	72	86	86		No Significant Change	0.55
1211	69	68	67	77	59	65	67	80	63	79	63	77	72		No Significant Change	0.32
1212	67	68	61	68	63	54	54	49	54	57	55	71	69		No Significant Change	0.31

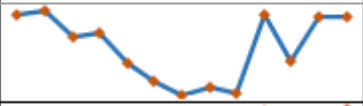
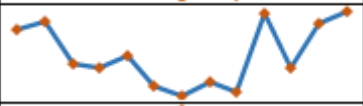
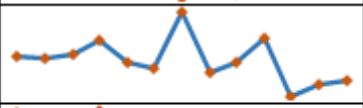
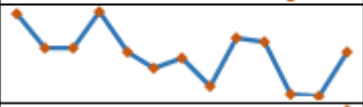
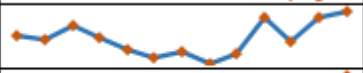
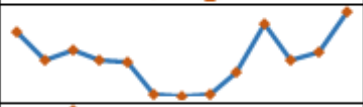
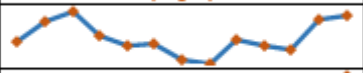
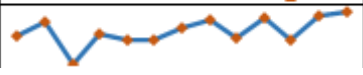
Note: For calculation of CAGR refer to Page No. 271

Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
1251	66	78	73	71	75	75	75	73	65	86	66	80	74		No Significant Change	0.81
1252	53	77	70	73	74	78	74	73	50	81	67	63	67		Quality Improved	1.78
1253	78	79	75	67	77	65	70	74	63	84	73	67	63		Quality Deteriorate	-1.61
1310	86	84	84	78	78	70	77	63	73	63	69	84	84		No Significant Change	-0.20
1311	83	82	87	69	78	77	75	61	75	61	69	84	85		No Significant Change	0.16
1312	81	84	75	75	80	78	79	85	73	85	75	85	87		No Significant Change	0.58
1313	66	76	72	73	76	74	74	66	65	85	64	85	70		No Significant Change	0.49
1314	69	77	74	70	75	65	69	68	64	86	68	74	76		No Significant Change	0.77
1315	66	62	69	66	59	50	55	60	52	70	57	67	72		No Significant	0.70

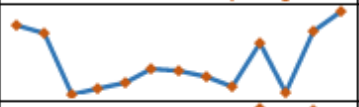
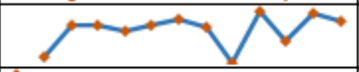
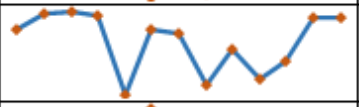
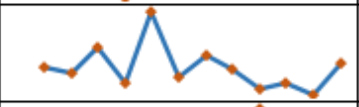
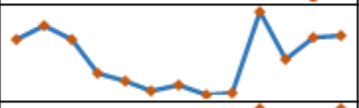
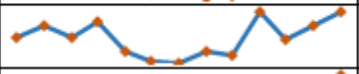
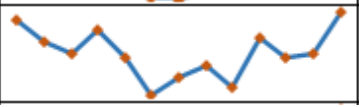
Note: For calculation of CAGR refer to Page No. 271

Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
1461	82	57	78		58	75	79	78	69	82	73	82	80		No Significant Change	-0.19
1462	77	73	76	81	78	80	82	31	71	78	55	84	77		No Significant Change	-0.03
1463	69	65	67	70	62	63	71	67	67	58	60	65	70		No Significant Change	0.10
1904	86	86	87	83	78	82	75	62	75	63	68	85	85		No Significant Change	-0.06
1905	86	82	82	75	76	80	73	61	75	63	67	83	85		No Significant Change	-0.06
1906	83	82	85	80	77	77	76	64	77	65	72	86	84		No Significant Change	0.09
1907	70	75	67	77	73	65	67	72	65	88	71	77	77		No Significant Change	0.71
1908	75	71	61	70	60	57	55	56	55	72	60	70	70		No Significant Change	-0.56

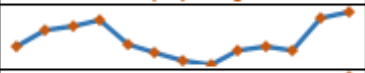
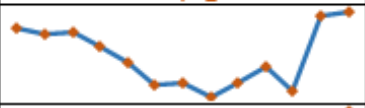
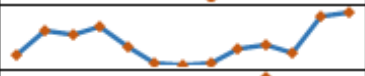
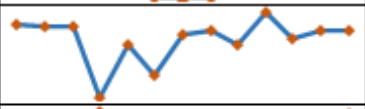
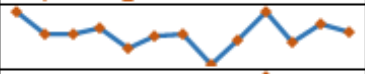
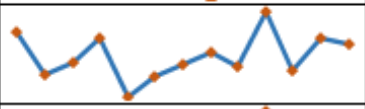
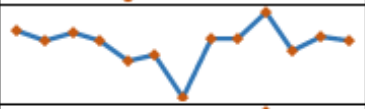
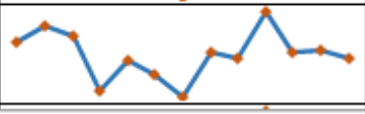
Note: For calculation of CAGR refer to Page No. 271

Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
1909	69	70	65	66	59	56	53	54	53	69	60	69	69		No Significant Change	-0.04
1910	68	70	60	59	62	54	52	55	53	72	59	69	72		No Significant Change	0.49
1911	67	66	68	72	65	63	80	62	65	72	56	59	60		No Significant Change	-0.81
1912	67	60	60	68	59	56	58	52	62	62	51	50	59		No Significant Change	-0.95
1913	62	60	67	61	55	51	54	49	53	70	59	70	73		Quality Improved	1.32
2155	67	58	61	58	57	46	45	46	54	70	57	61	75		No Significant Change	0.81
2156	60	69	73	62	58	59	52	51	61	58	57	69	71		Quality Improved	1.29
2157			69	61	61	81	78	83	73	82	72	85	86		Quality Improved	1.77
2158	76	84	75	75	79	79	78	83	73	85	70	84	87		Quality Improved	1.10
2159	75	82	61	76	73	73	79	83	74	84	73	85	87		Quality Improved	1.13

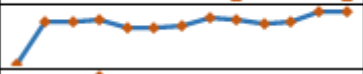
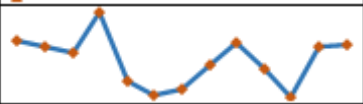
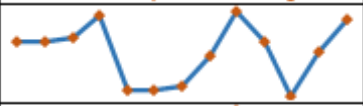
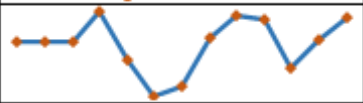
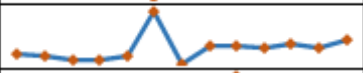
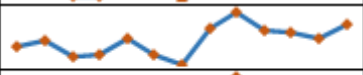
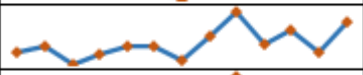
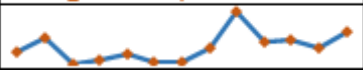
Note: For calculation of CAGR refer to Page No. 271

Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
2160	84	84	75	82	75	78	80	84	72	85	72	81	87		No Significant Change	0.27
2161	85	83	74	75	75	78	77	77	75	82	74	84	87		No Significant Change	0.20
2162		70	79	79	78	79	81	79	68	84	75	83	81		Quality Improved	1.13
2163	87	82	86	70	78	60	78	62	75	62	68	84	85		No Significant Change	-0.18
2164	84	89	90	88	61	83	82	64	77	66	72	88	88		No Significant Change	0.35
2168		40	38	47	34	61	36	44	39	32	34	30	42		No Significant Change	0.34
2170	70	74	71	62	60	58	59	57	57	77	66	71	71		No Significant Change	0.10
2171	61	66	62	68	56	52	52	56	54	72	61	66	71		Quality Improved	1.17
2172	71	65	62	69	61	52	56	59	54	66	61	62	73		No Significant Change	0.21

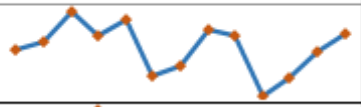
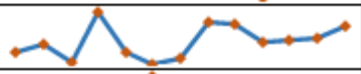
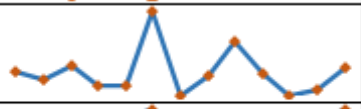
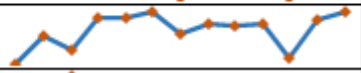
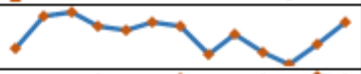
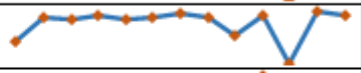
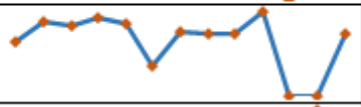
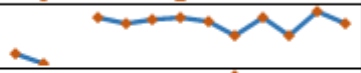
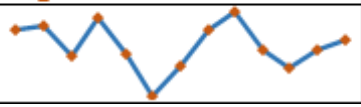
Note: For calculation of CAGR refer to Page No. 271

Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
2173	73	71	72	67	65	59	59	63	59	69	64	65	75		No Significant Change	0.23
2174	57	65	67	69	58	54	51	48	55	57	55	70	73		Quality Improved	1.97
2175	70	69	69	66	62	56	57	53	57	61	55	73	74		No Significant Change	0.40
2176	53	65	63	66	57	48	48	48	55	58	54	71	74		Quality Improved	2.60
2177	76	76	75	40	67	51	71	73	67	83	69	73	74		No Significant Change	-0.28
2178	61	51	62	76	49	54	51	68	59	72	59	67	76		Quality Improved	1.66
2179	80	68	68	72	60	67	68	51	65	80	63	74	69		Quality Deteriorate	-1.12
2180	74	60	64	72	53	60	63	67	63	80	62	72	70		No Significant Change	-0.45
2181	71	64	70	64	52	56	30	65	65	82	58	67	65		No Significant Change	-0.67
2182	74	81	76	53	66	60	51	69	67	87	70	71	67		No Significant Change	-0.68

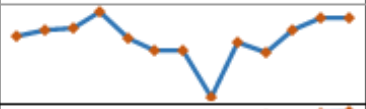
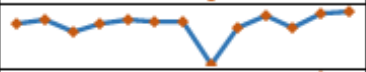
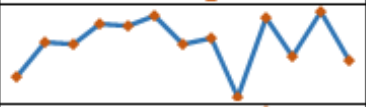
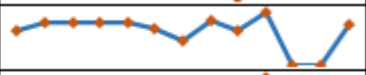
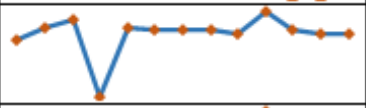
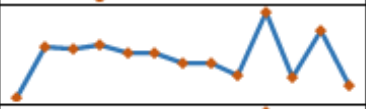
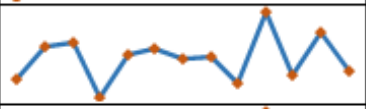
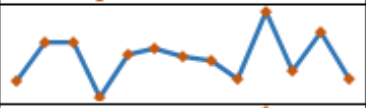
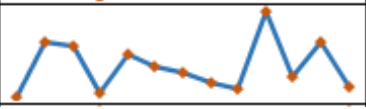
Note: For calculation of CAGR refer to Page No. 271

Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
2183	79	84	77	76	76	71	72	70	67	87	69	83	67		Quality Deteriorate	-1.31
2186	7	67	66	69	57	57	59	72	69	64	65	79	80		Quality Improved	20.12
2187	66	65	64	72	58	54	56	61	66	60	54	65	66		No Significant Change	-0.07
2188	64	64	65	69	55	55	56	62	70	64	54	62	68		No Significant Change	0.48
2189	66	66	67	69	59	60	60	68	72	64	59	66	69		No Significant Change	0.42
2190	63	63	63	69	59	51	53	64	68	68	57	63	68		No Significant Change	0.63
2191	35	33	30	29	34	71	27	41	42	41	43	41	47		Quality Improved	2.38
2192	38	42	33	33	42	33	29	47	56	46	46	43	50		Quality Improved	2.21
2193	45	46	41	44	46	47	42	50	58	47	52	45	55		Quality Improved	1.62
2194	40	46	35	36	39	36	36	42	58	44	46	41	49		Quality Improved	1.62

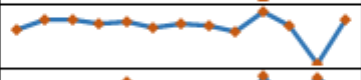
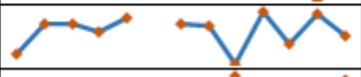
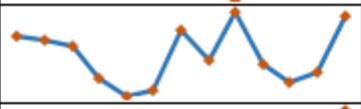
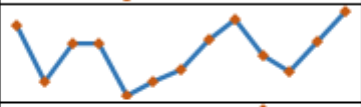
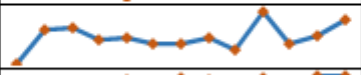
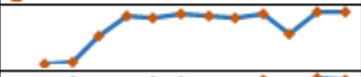
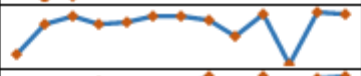
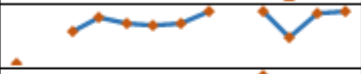
Note: For calculation of CAGR refer to Page No. 271

Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
2195	55	57	62	58	61	50	52	59	58	46	49	55	58		No Significant Change	0.44
2196	39	43	33	60	39	33	36	55	54	45	45	47	53		Quality Improved	2.37
2197	57	55	58	54	54	71	51	56	64	57	51	53	58		No Significant Change	0.15
2198	44	62	53	73	73	76	63	70	68	70	48	72	77		Quality Improved	4.41
2199	65	85	88	79	76	81	79	63	74	64	56	69	81		Quality Improved	1.66
2651	65	78	76	78	77	78	80	77	69	78	54	80	78		Quality Improved	1.38
2652	56	77	72	80	75	31	65	64	64	87	No data	Dry	63		No Significant Change	0.88
2653	66	61		79	76	77	61	78	72	78	72	82	78		Quality Improved	1.31
2654	65	61		79	77	78	79	77	72	79	72	81	76		Quality Improved	1.27
2655	63	65	57	66	57	46	54	63	68	58	53	58	61		No Significant Change	-0.28

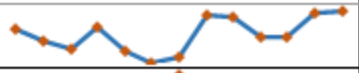
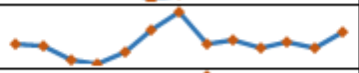
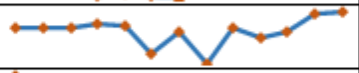
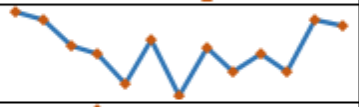
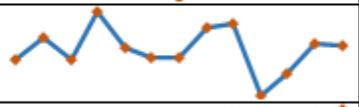
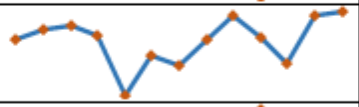
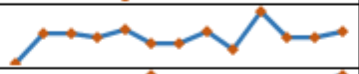
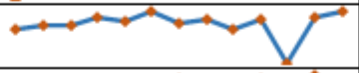
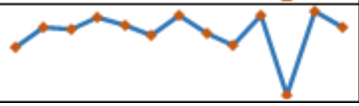
Note: For calculation of CAGR refer to Page No. 271

Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
2656	65	68	68	75	64	59	59	41	62	58	67	72	73		No Significant Change	0.81
2657	75	78	68	76	78	76	78	41	71	83	73	84	86		Quality Improved	1.03
2658	60	74	72	80	80	83	73	75	53	83	68	85	67		No Significant Change	0.74
2659	58	72	72	73	75	63	40	76	59	90	No data	Dry	71		Quality Improved	1.60
2660	61	75	82	8	73	72	72	71	68	89	72	67	69		No Significant Change	0.84
2661	61	78	77	78	75	75	72	72	68	89	67	83	65		No Significant Change	0.47
2662	68	77	79	63	75	77	74	75	67	88	69	82	71		No Significant Change	0.32
2663	67	78	78	62	75	76	74	73	68	87	70	81	67		No Significant Change	0.03
2664	67	80	79	67	77	74	72	70	69	88	72	80	69		No Significant Change	0.25

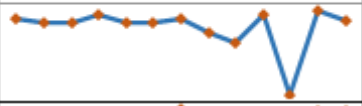
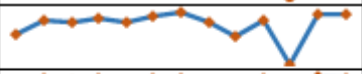
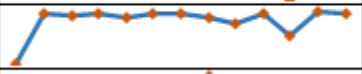
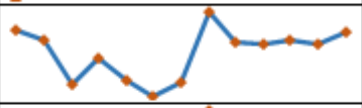
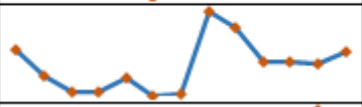
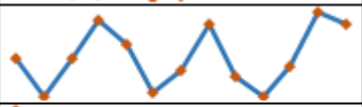
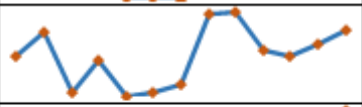
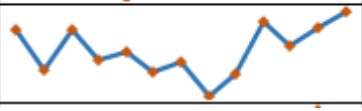
Note: For calculation of CAGR refer to Page No. 271

Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
2665	57	59	60	67	54	61	51	60	62	48	54	64	67		Quality Improved	1.24
2666	59	78	77	69	73	62	69	67	55	90	65	Dry	77		Quality Improved	2.01
2667	52	75	75	68	78		75	72	46	83	60	82	66		Quality Improved	1.81
2668	60	59	58	52	49	49	61	55	64	55	51	53	64		No Significant Change	0.48
2669	65	55	61	61	53	55	57	62	65	59	57	62	67		No Significant Change	0.26
2670	57	77	79	71	73	69	70	73	65	89	70	74	84		Quality Improved	3.06
2671		5	6	36	59	59	62	61	58	61	38	64	64		Quality Improved	22.32
2672	60	75	79	75	77	79	79	77	69	80	55	81	80		Quality Improved	2.25
2673	55		73	81	78	76	77	85		85	69	84	84		Quality Improved	3.36
2674	56	79	75	74	78		74	74	56	86	60	77	75		Quality Improved	2.16
2675	38	42		64	59	41	41	71	50	63	46	48	72		Quality Improved	5.12
2676	59	91	89	85	84	31	79	63	75	64	70	82	86		Quality Improved	2.93

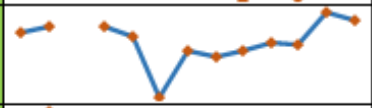
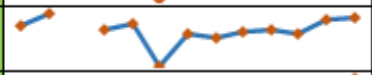
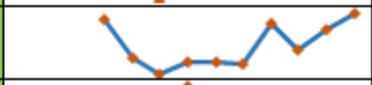
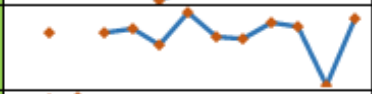
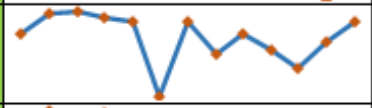
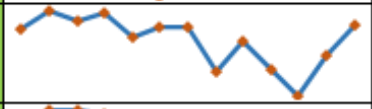
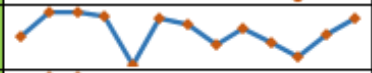
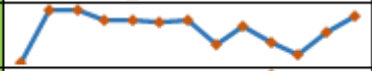
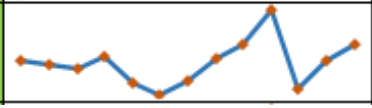
Note: For calculation of CAGR refer to Page No. 271

Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
2677	52	46	43	53	42	36	39	59	58	49	48	60	61		Quality Improved	1.16
2678	42	41	33	32	38	51	60	42	44	40	44	40	49		Quality Improved	1.18
2679			60	32	33	31	29	71	41	39	42	40	43		Quality Deteriorate	-2.53
2680	71	72	73	75	74	51	69	42	72	63	69	83	86		Quality Improved	1.42
2681	68	65	59	56	48	60	45	58	51	56	51	65	64		No Significant Change	-0.43
2682	59	63	59	68	61	59	59	65	66	52	56	62	62		No Significant Change	0.35
2683	64	66	67	65	50	60	57	64	69	64	58	70	71		No Significant Change	0.82
2684	52	72	72	69	75	65	64	74	62	87	70	69	74		Quality Improved	2.78
2685	66	69	70	75	74	81	72	74	67	74	42	75	80		Quality Improved	1.47
2686	72	79	77	82	79	75	83	76	72	83	54	84	78		No Significant Change	0.71

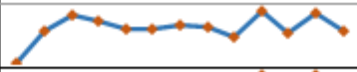
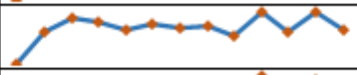
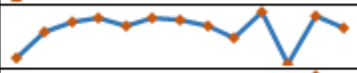
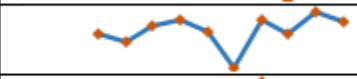
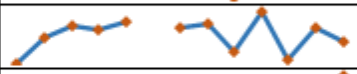
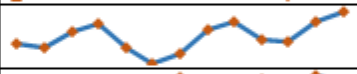
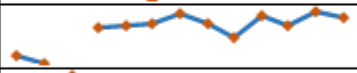
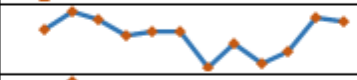
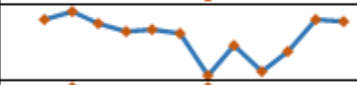
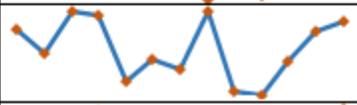
Note: For calculation of CAGR refer to Page No. 271

Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
2687	80	78	78	82	79	79	80	76	72	82	55	83	79		No Significant Change	-0.06
2688	70	77	76	79	76	80	81	76	69	77	55	80	80		Quality Improved	1.03
2689	23	81	79	81	76	81	81	76	68	80	54	82	79		Quality Improved	9.92
2690	46	44	36	41	37	34	37	49	44	44	44	43	46		No Significant Change	-0.12
2691	49	40	35	35	39	34	34	60	55	44	45	44	48		No Significant Change	-0.10
2692	70	60	70	80	73	60	66	79	65	60	67	82	79		No Significant Change	0.94
2693	61	55	49	56	46	46	45	57	53	49	48	48	53		Quality Deteriorate	-1.02
2694	43	48	35	43	35	35	37	52	53	45	43	46	49		No Significant Change	0.92
2695	60	47	60	50	52	46	49	38	45	62	54	60	65		No Significant Change	0.73

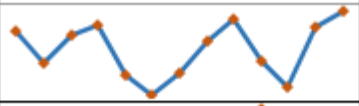
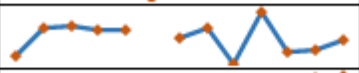
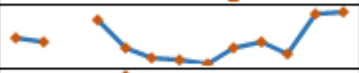
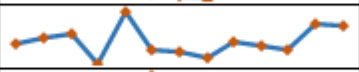
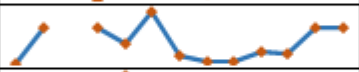
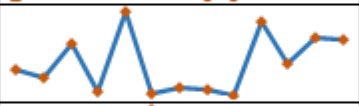
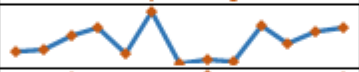
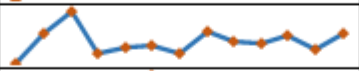
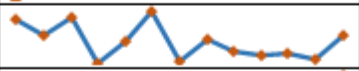
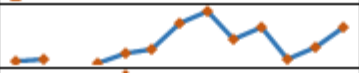
Note: For calculation of CAGR refer to Page No. 271

Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
2696								77	72	80	73	83	79		No Significant Change	0.16
2697	66	69		69	63	30	55	53	55	60	58	77	72		No Significant Change	0.76
2698	62	76		59	64	21	55	50	57	59	55	70	72		Quality Improved	1.15
2699				72	55	48	53	53	52	70	58	67	74		No Significant Change	0.25
2700		58		59	62	45	81	53	51	70	64	Dry	73		Quality Improved	1.88
2701	75	87	89	85	83	40	82	64	75	66	56	71	82		No Significant Change	0.69
2702	81	88	84	87	78	82	82	65	76	66	56	71	83		No Significant Change	0.14
2703	70	86	86	83	50	81	77	64	75	65	56	71	82		Quality Improved	1.29
2704	52	87	86	80	80	79	80	64	75	65	57	72	82		Quality Improved	3.65
2705	65	64	63	66	59	56	60	65	69	78	58	65	69		No Significant Change	0.47

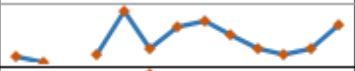
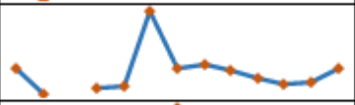
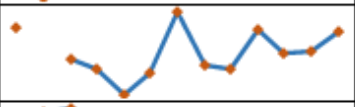
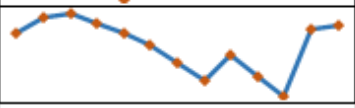
Note: For calculation of CAGR refer to Page No. 271

Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
2706	57	73	81	78	74	74	76	75	70	83	72	82	73		Quality Improved	1.93
2707	56	73	79	78	73	77	75	75	70	83	72	82	73		Quality Improved	2.07
2708	57	72	77	78	75	78	77	75	68	82	54	81	74		Quality Improved	2.00
2709				76	74	78	79	76	67	79	76	81	79		No Significant Change	0.32
2710	56	70	76	74	79		76	77	62	84	58	76	68		Quality Improved	1.55
2711	61	60	66	69	60	54	58	66	70	63	62	69	73		Quality Improved	1.39
2712	60	56		74	75	76	81	76	69	80	75	82	79		Quality Improved	2.16
2713		83	92	88	80	82	82	64	76	66	72	88	87		No Significant Change	0.33
2714		89	92	87	83	85	82	64	77	65	74	89	88		No Significant Change	-0.05
2715	65	59	69	68	52	58	55	69	50	49	57	64	67		No Significant Change	0.25
2716	72	69	69	78	65	66	68	74	75	74	65	76	78		No Significant Change	0.68

Note: For calculation of CAGR refer to Page No. 271

Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
2717	66	59	65	67	56	52	56	64	68	59	53	66	70		No Significant Change	0.49
2718	57	75	77	75	74		69	76	51	86	59	61	68		Quality Improved	1.35
2719	60	58		67	56	52	51	50	56	58	53	70	70		Quality Improved	1.28
2720	62	66	68	51	80	59	58	54	63	61	59	73	72		Quality Improved	1.25
2721	54	73		72	64	81	58	55	55	60	59	73	73		Quality Improved	2.25
2722	64	62	72	58	81	58	59	59	57	78	66	73	72		No Significant Change	0.90
2723	57	58	66	71	55	80	50	51	50	71	61	69	71		Quality Improved	1.74
2782	21	33	41	24	30	28	26	42	38	35	32	29	41		Quality Improved	5.18
2783	21	42	58	28	32	33	29	43	36	36	41	32	42		Quality Improved	5.40
2784	55	44	56	26	41	60	27	42	33	30	32	28	44		Quality Deteriorate	-1.79
2785	19	24		24	24	22	27	26	28	26	20	28	33		Quality Improved	4.29
2786	19	20		18	23	26	39	46	31	37	21	27	37		Quality Improved	5.15

Note: For calculation of CAGR refer to Page No. 271

Station Code	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	Trend	Quality	CAGR %
2787	20	18		21	43	24	35	39	31	24	22	25	37		Quality Improved	4.77
2788	34	13		16	19	80	33	36	32	26	21	23	34		No Significant Change	-0.02
2789	71		52	46	30	43	80	47	46	70	55	56	68		No Significant Change	-0.31
2790	79	87	88	83	79	73	65	56	69	59	49	81	83		No Significant Change	0.42

Note: For calculation of CAGR refer to Page No. 271

Maharashtra Pollution Control Board

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