

# ES Assignment 1:

## To examine the water quality and pollution of Pawana River in Pune

Subject- Enviromental Substainability

Submitted by-Siddiqa Asifiqbal Bagwan.

PRN-B24CE1093

branch-SE computer2

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college-MMCOE

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### Sr.no

#### **1:- Introduction:-**

There are number of Rivers in Pune Division.Earlier the rivers used to be non-polluted and had high WQI( water quality index).As the population and construction increased it resulted in the polluted water bodies . In this paper we are going to take a look on how the WQI and pollution or cleanliness of PAWANA River was in particular years.

#### **2:- Objective:-**

- 1.To analyze current water quality of River Pawana.
- 2.To study the various trends from the data over the years.
- [3.To](#) identify the sources of pollution affecting the river.
- [4.To](#) suggest medication majors for improving the river water quality .

#### **3:- Methodology:-**

Data of various parameters for several years is posted by Maharashtra pollution control board on their website .tThe samples are taken from fixed locations on the entire co/ast of the river on a monthly basis.The following parameters shall be considered for analysis of data.

##### **3.1: List of parameters-**

1. pH
2. WQi
3. Dissolved oxygen
4. BOD
5. COD
6. Nitrates
7. Fecal coliform

##### **3.2 Selection of locations:-**

The following four locations on the course of River Pawana have been selected :

1. 2690- Kasarwadi
2. 2691-Dapodi
3. 2692-Ravet
4. 2693- chinchwadgaon

#### 4:- Observation(Sample Data)

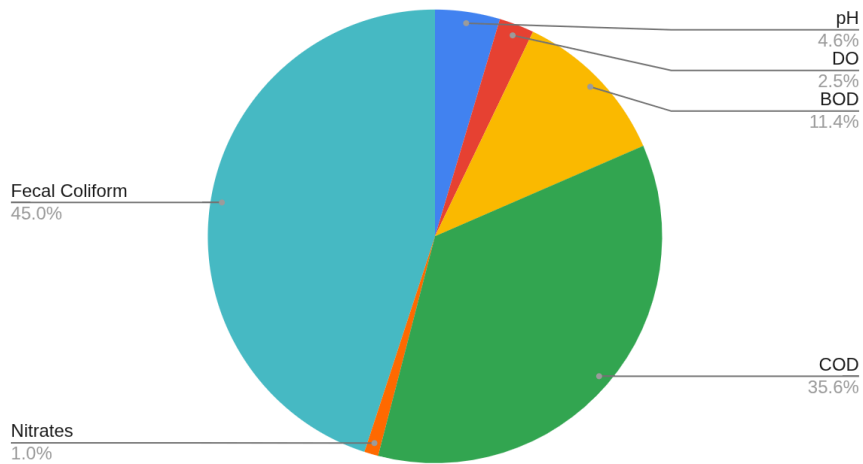
Months	Parameters						
	pH	Dissolved Oxygen (mg/l)	B.O.D. (mg/l)	C.O.D. (mg/l)	Nitrate (mg/l)	Fecal Coliform (MPN/100 ml)	WQI
YEAR : 2024							
January	7.9	2.2	36	92	1.3	95	37.70
February	7.6	3	29	80	2.32	275	42.02
March	7.9	3.6	14	68	1.89	540	44.72
April	7.6	3	16	88	0.77	275	45.06
May	7.7	2.9	16.6	64	2	150	45.67
June	7.7	2.2	18.1	68	1.25	250	38.66
July	7.7	2.4	13.2	40	0.8	430	38.68
August	7.8	4.9	5.6	8	3.56	92	65.16
September	7.4	0.3(BDL)	6.8	20	1.84	140	42.69
October	7.4	4.1	6.8	20	2.31	140	60.37
November	7.5	1.1	21	80	4.14	210	36.40
December	7.5	1	25	52	3.42	280	34.22

#### 5:- Graphs

Parameters trend analysis : (reference year 2023)

parameters	Kasarwadi	Dapodi	Ravet	chinchwadgaon
pH	7.43	7.37	7.55	7.42
DO	4	3.72	5.9	5
BOD	18.31	21.13	3.68	7.39
COD	57.26	63.58	12.74	24.38
Nitrates	1.61	1.53	0.6	1.85
Fecal Coliform	72.42	86.08	13	44.92

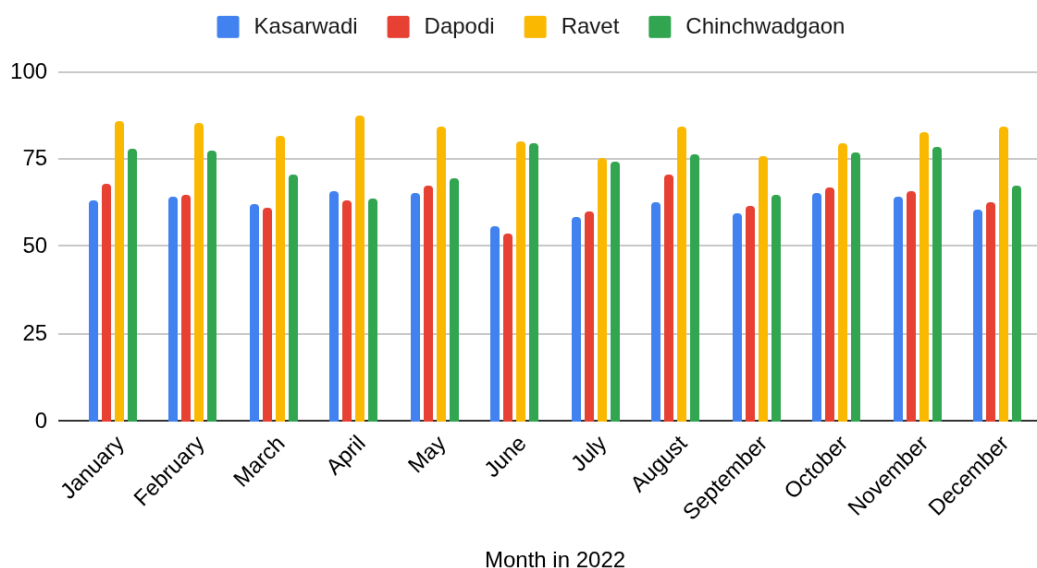
### Kasarwadi, Dapodi, Ravet and chinchwadgaon



### 5.2: Seasonal Trends(Reference year-2022)

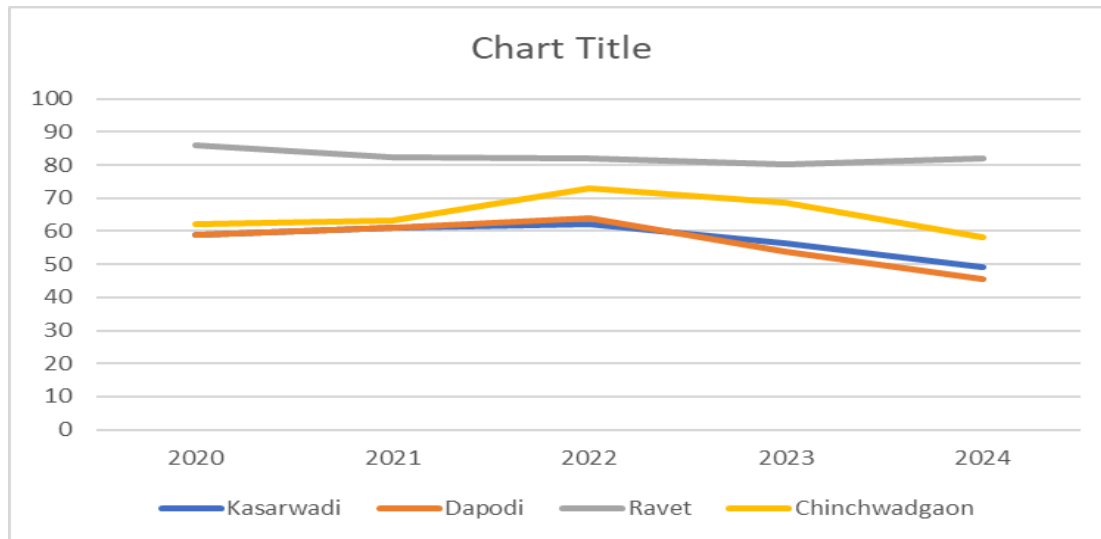
Month in 2022	Kasarwadi	Dapodi	Ravet	Chinchwadgaon
January	63.13	67.94	85.95	78.14
February	64.35	64.85	85.49	77.51
March	61.88	61.23	81.46	70.36
April	66.02	63.19	87.46	63.94
May	65.20	67.29	84.05	69.74
June	55.77	53.83	80.10	79.40
July	58.68	60.04	75.48	74.10
August	62.47	70.33	84.21	76.44
September	59.54	61.39	75.81	64.88
October	65.41	66.79	79.54	77.18
November	64.04	65.60	82.57	78.58
December	60.78	62.80	84.08	67.53

## Kasarwadi, Dapodi, Ravet and Chinchwadgaon



### 5.3 Reference year (2020-2024)

locations	2020	2021	2022	2023	2024
Kasarwadi	58.85	61.01	62.27	56.34	49.28
Dapodi	58.87	61.04	63.82	53.76	45.61
Ravet	86.05	82.46	82.18	80.39	81.99
Chinchwadgaon	62.03	63.18	73.16	68.74	58.36



## 6:- Analysis

### Seasonal Analysis

- Over the years, the Water Quality Index (WQI) has generally been **satisfactory during the monsoon season**.
- This is likely due to the **dilution effect of heavy rainfall**, which reduces the concentration of pollutants in the water by mixing them with relatively cleaner rainwater
- In summer as the water level decreases, the amount of pollutants mixed in rivers become more so the WQI is low

### Yearly Analysis

- **Up to 2019:** The WQI showed a **declining trend**, indicating a gradual deterioration in water quality.
- **In 2020:** The WQI began to **normalize**, likely due to the **nationwide lockdown** which led to a significant **reduction in industrial activities** and, consequently, pollutant discharge.
- **By 2022:** The WQI reached its **highest value in nearly a decade**, reflecting **stabilized pollution levels** and **improved water quality**.

- **Post-2022:** As industries resumed full operations, the WQI began to **decline again**, suggesting a **return of increased pollution levels**.

### Parameter-Based Analysis

- **Fecal Coliform:**
  - **Lowest:** Pawna River at Ravet — *13*
  - **Highest:** River at Dapodi — *86*  
This indicates that microbial contamination is significantly higher in Dapodi compared to Ravet.
- **Chemical Oxygen Demand (COD):**
  - **Lowest:** Ravet — *12.7 mg/L*
  - **Highest:** Dapodi — *63 mg/L*  
Higher COD at Dapodi indicates the presence of more organic pollutants requiring oxygen for decomposition, pointing to **greater industrial or domestic wastewater discharge**.

### Nitrates :

The amount of Nitrates is less for Ravet compared to other areas

### 7:- Major Sources of Pollution :

key reasons behind pollution in the Pavana (Pawana) River :

#### 1. Discharge of Untreated Sewage & Industrial Effluents

Around 65 polluted nullahs discharge directly into the Pavana River within PCMC limits. These carry both domestic sewage and industrial wastewater without adequate treatment, causing continuous year-round contamination .

PCMC has sewage treatment capacity of ~240 MLD but generates ~290 MLD, leaving a 30–40 MLD gap of untreated sewage that flows into local rivers .

#### 2. Elevated Biochemical Oxygen Demand (BOD)

Monitoring by the MPCB (Nov 2023–Jan 2024) detected BOD levels above 30 mg/L, classifying this stretch of the river into Priority 1 (most highly polluted) requiring urgent remediation .

### **3. Dumping of Pollutants & Carcasses**

In areas like Ravet, local dumping of dead animals and animal fat into the river has been reported, particularly near the Ravet water pumping station—posing serious health risks since this water is pumped for municipal drinking supply .

### **4. Silt, Construction Waste & Urban Runoff**

Sedimentation from nearby hills and construction zone runoff contributes to silt buildup, making water stagnant and less oxygenated. This is exacerbated by rampant development in sectors like Ravet and Chinchwad .

### **5. Weak Governance & STP Underutilization**

Several Reddit users and civic activists highlight poor governance: inefficiencies in sewage treatment plant operations, lack of enforcement, and limited citizen oversight and auditing of STPs .

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#### **Impact by Area:**

Ravet / Thergaon: river water used directly for drinking; dumping of carcasses and silt pose health threats

Chinchwad, Dapodi, Wadgaon: major nullahs feeding polluted urban and industrial wastewater into the river

All PCMC suburbs: polluted drains worsen as river flows across municipal boundaries

### **8:- Recommendations**

## **1. Upgrade & Expand Sewage Treatment Capacity**

Construct new STPs and upgrade old ones to meet the increasing load of urban sewage.

Ensure 100% sewage coverage—no untreated sewage should enter the river.

Install real-time monitoring systems for STPs and make data public for transparency.

## **2. Strict Industrial Waste Management**

Enforce zero liquid discharge (ZLD) norms for industries.

Penalize industries that dump hazardous waste into the river or drains.

Encourage common effluent treatment plants (CETPs) for clusters of small-scale industries.

## **3. Control Illegal Dumping & Solid Waste**

Ban dumping of animal waste, construction debris, and plastics near the river.

Install CCTV cameras and deploy river marshals in high-risk zones like Ravet and Kasarwadi.

Build barriers and collection traps at nullah entry points to stop floating waste.

## **4. Riverbank Beautification & Fencing**

Construct green buffer zones along riverbanks with trees and grass to filter runoff.

Build walkways, gardens, and lighting to discourage encroachments and misuse.

Fence sensitive areas like water pumping stations (e.g., in Ravet) to stop direct access and contamination.



## **5. Community Awareness & Participation**

Launch campaigns in local schools, colleges, and housing societies about river pollution.

Create “Adopt a River Stretch” programs involving NGOs and citizen groups.

Organize monthly cleanup drives with volunteers.

## **6. Rainwater Harvesting & Urban Planning**

Make rainwater harvesting mandatory for large housing and industrial setups to reduce stormwater pollution.

Promote green buildings and permeable pavements to minimize runoff into drains.

## **7. Government Collaboration & Monitoring**

PCMC, MPCB, and Irrigation Department should form a River Pollution Task Force for coordinated action.

Conduct quarterly water quality audits and publish results in public domain.

Enforce polluter pays principle—fine violators and use the money for river restoration.

## **8. Implement Pavana Rejuvenation Project Smartly**

Speed up tendering and execution of the approved ₹1,440 crore river rejuvenation plan.

Prioritize sewage management, biodiversity restoration, and community spaces.

Appoint independent environmental consultants to monitor project quality and impact.

## **9:- Conclusion**

The Pawana River, once a vital freshwater source for the Pimpri-Chinchwad region, is now facing alarming levels of pollution due to unchecked urbanization, direct discharge of untreated sewage, industrial effluents, and solid waste dumping. The river stretches passing through Ravet, Kasarwadi, Dapodi, and Wadgaon are particularly affected, where water quality has drastically deteriorated, posing serious environmental and public health risks.

High Biochemical Oxygen Demand (BOD) levels, the presence of harmful pollutants, and dumping of animal waste in critical zones like Ravet highlight the urgent need for intervention. Despite the establishment of sewage treatment plants, gaps in capacity, underutilization, and poor governance continue to threaten the river's ecosystem.

However, with the planned Pavana River Rejuvenation Project, combined with stronger enforcement, public participation, and sustainable waste management practices, there is still hope for restoring the river's health. Effective action must be taken now—not only by the government, but by industries, local communities, and individuals—to ensure that the Pawana River can once again serve as a clean and life-sustaining water body for current and future generations.

## **10:- References**

<https://mpcb.gov.in/node>