e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
( Peer-Reviewed, Open Access, Fully Refereed International Journal )
Volume:07/Issue:01/January-2025 Impact Factor- 8.187 www.irjmets.com

# A CASE STUDY OF MEDIUM IRRIGATION PROJECT IN DHULE DISTRICT OF MAHARASHTRA

**Mr. Bhausaheb P. Patil*1, Dr. Pankaj Y. Shinde*2**

*1Research Scholar, PG & Research Department Of Geography Sant Dnyaneshwar Mahavidyalaya, Soegaon, Dist.-Chhatrapati Sambhajinagar (MS), India.

*2Guide, PG & Research Department Of Geography Sant Dnyaneshwar Mahavidyalaya, Soegaon, Dist.-Chhatrapati Sambhajinagar (MS), India.

DOI: https://www.doi.org/10.56726/IRJMETS65910

## ABSTRACT

Water is the foundation of life, and its scarcity can have far-reaching consequences. As the global population continues to grow, the demand for water increases, putting pressure on this finite resource. Water reservoirs play a crucial role in managing water resources, supporting various aspects of human life, and maintaining ecological balance. One of the most significant importance of water reservoirs is their ability to store water during periods of excess rainfall, reducing flood risks and making water available during dry periods. This helps to regulate streamflow, preventing sudden changes in water levels and protecting downstream ecosystems.

Water reservoirs also play a vital role in supporting agriculture, which is the backbone of many economies. By providing water for irrigation, reservoirs increase crop yields and food security, supporting the livelihoods of millions of people.

**Keywords:** Water, Reservoir, Resources, Agriculture, Irrigation, Economy.

## I. INTRODUCTION

The Dhule district is comes under the rain shadow area of the Sahyadri mountain of Maharashtra. There is very much scarcity of water for irrigation as well as drinking purpose throughout year. But water projects are play an important role in water management and requirement of the region. The Dhule region is required a major water project for fulfilment the water requirement.

## II. LOCATION AND EXTENT

The district of Dhule is located in Maharashtra State's northwest. It covers the latitude range of 20°38' to 21°38' North and the longitude range of 74°52' to 75°11' East. Dhule makes up 2.62% of Maharashtra's total land area, with an area of 8,063.11 square kilometers. The district is 112 kilometers long from south to north and 108 kilometers long from west to east. At a scale of 1:250,000, its territory is shown on Survey of India degree sheets No. 46K, 46L, 46O, 46G, and 46H. Barwani district in Madhya Pradesh borders the district to the north, Jalgaon district to the east, Nasik district to the south, and Nandurbar district to the west. Dang district in Gujarat touches the district's southwest border..

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
( Peer-Reviewed, Open Access, Fully Refereed International Journal )
Volume:07/Issue:01/January-2025 Impact Factor- 8.187 www.irjmets.com

## III. CLIMATE

Dhule district gets a monsoon climate due to its location on the Indian subcontinent. With the exception of the south-west monsoon season, the district remains dry overall. In the research area, the year is split into four seasons, as follows:

1) The Summer : February to May
2) The Rainy or Monsoon Season : June to September
3) The Winter Season : October to January)

Due to unavailability of meteorological observatory in the area, the climatic data is made accessible from Agricultural College, Dhule and other sources. Temperature, rainfall, humidity, evaporation, and wind speed are all essential climatic indicators. Due to the October heat, the average monthly maximum temperature is 34.2°C. It gradually decreases as the winter season approaches. During the winter season, January is the coldest month, with an average daily minimum temperature of 11.8°C and a maximum daily temperature of 30.1°C. When a cold wave hits northern India, the lowest temperature might plummet to 8.9 °C. The temperature begins to climb from the third week of February to the end of May. The month of May is the warmest of the year. The mean daily maximum temperature in May is 40.7 degrees Celsius. Temperatures can occasionally get to 46 degrees Celsius in the same month.

**Rainfall:**

During the months of June through September, the study region receives the majority of its rainfall from South-West monsoon winds. The average annual rainfall in the area is 592 mm. As a result, the district is classified as a drought-prone zone in the state. The average yearly rainfall varies significantly from year to year. According to P. K. Das, the South-West monsoon season in the research region begins on June 7th. July receives the most rainfall of any wet month, with an average of 160 mm. The number of wet days is fewer than 45. Shirpur tehsil has the most annual rainfall, with an average of 658.3 mm. Dhule tehsil comes in second with 605.1 mm of yearly rainfall, while Shindkheda tahsil has 558.3 mm. Despite its western position within the district, Sakri receives the least amount of rainfall, 514.1 mm per year. The Western Ghat and Satpura hills get more than 1000 mm of rainfall each year.

**Table 1:** Mean Monthly Maximum and Minimum Temperature (°C) at Dhule

| Sr. No. | Month | Temperature | | |
|---|---|---|---|---|
| | | Maximum | Minimum | Mean |
| 1 | January | 30.1 | 11.8 | 21.0 |
| 2 | February | 32.4 | 13.4 | 22.9 |
| 3 | March | 37.1 | 18.4 | 27.4 |
| 4 | April | 40.5 | 22.7 | 31.6 |
| 5 | May | 41.6 | 26.0 | 33.8 |
| 6 | June | 37.2 | 25.4 | 31.3 |
| 7 | July | 32.8 | 24.1 | 28.5 |
| 8 | August | 31.2 | 23.3 | 27.3 |
| 9 | September | 32.7 | 22.5 | 27.6 |
| 10 | October | 34.2 | 19.9 | 27.1 |
| 11 | November | 32.2 | 15.2 | 23.7 |
| 12 | December | 30.1 | 12.1 | 21.1 |
| | Annual | 34.3 | 19.6 | 27.00 |

Source: Agriculture College, Dhule.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
( Peer-Reviewed, Open Access, Fully Refereed International Journal )
Volume:07/Issue:01/January-2025 Impact Factor- 8.187 www.irjmets.com

The South-West monsoon winds provide up to 88% of yearly rainfall, with thunder storms during the pre-monsoon and post-monsoon periods accounting for the remainder. The Department of Agriculture, Government of Maharashtra, has split the state into nine zones based on rainfall, soils, and vegetation. According to it, the district is in the Scarcity Zone. Droughts are prevalent in the district.

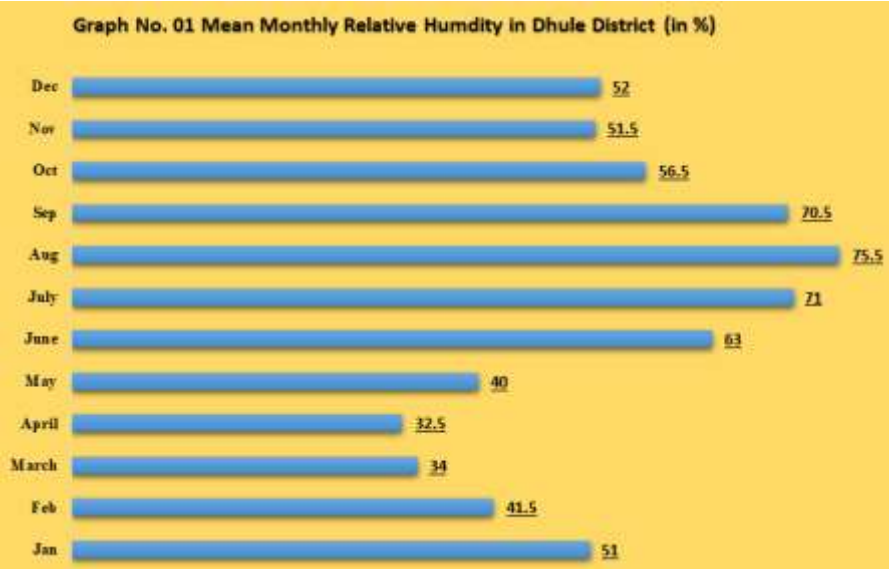
**Table 2:** Tehsil wise Mean Monthly Rainfall (in mm)

| Sr. No. | Month | Dhule | Sakri | Shirpur | Shindkheda | District | |
|---|---|---|---|---|---|---|---|
| | | | | | | Amount | Percent |
| 1 | January | 5.0 | 4.6 | 3.4 | 3.7 | 4.2 | 0.7 |
| 2 | February | 1.5 | 1.3 | 1.3 | 1.3 | 1.4 | 0.2 |
| 3 | March | 2.7 | 3.0 | 1.9 | 1.4 | 2.3 | 0.4 |
| 4 | April | 1.5 | 3.0 | 1.5 | 1.3 | 1.8 | 0.3 |
| 5 | May | 10.5 | 10.8 | 9.6 | 6.0 | 9.2 | 1.6 |
| 6 | June | 128.1 | 110.0 | 121.9 | 122.7 | 120.7 | 20.7 |
| 7 | July | 147.7 | 127.7 | 206.2 | 156.2 | 159.5 | 27.3 |
| 8 | August | 114.7 | 83.7 | 141.5 | 114.9 | 113.7 | 19.5 |
| 9 | September | 127.6 | 103.6 | 121.2 | 98.6 | 112.8 | 19.3 |
| 10 | October | 41.2 | 40.9 | 34.7 | 33.5 | 37.6 | 6.4 |
| 11 | November | 19.9 | 20.1 | 12.2 | 15.6 | 16.9 | 2.9 |
| 12 | December | 4.7 | 5.4 | 3.1 | 3.1 | 4.1 | 0.7 |
| | Annual | 605.1 | 514.1 | 658.3 | 558.3 | 583.9 | 100.00 |

Source: Agriculture College, Dhule.

**Humidity:**

Because of its continental position, the air in the study region is dry from October to May. During this time of year, the winter months have relative humidity levels of 40 to 45%. While it can be as low as 30 to 40% during the summer due to the high temperatures in the research location. Rainy months are the wettest of the year, with relative humidity levels over 70%.




**Graph 1:** Mean Monthly Relative Humidity (%) at Dhule

Source: Agriculture College, Dhule.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
( Peer-Reviewed, Open Access, Fully Refereed International Journal )
Volume:07/Issue:01/January-2025 Impact Factor- 8.187 www.irjmets.com

## IV. MEDIUM IRRIGATION PROJECT

The Dhule district has 12 medium irrigation projects. The whole command area measures 7700.49 hectors. Details about these initiatives have been discussed as follows:

**1. Kanoli Project:**

It is located near Nandale hamlet in Dhule tehsil, across the Kanoli river. It was completed in the year 1927. This dam has a height of 24.5 meters and a total storage capacity of 11.9 million cubic meters. This project has a gross command area of 1619.17 hectors, with 1363 hectors cultivable area.

**2. Panzara Project:**

This project is located near Pimpalner town in Sakri Tehsil. It was finished in 1979 at a total cost of Rs. 319.06 lakh. The dam's maximum height is 33.6 meters, and canals total 28.20 kilometers have been built. The project has a storage capacity of 43.42 M.Cu.M., with a gross command area of 6093.12 hectors, of which about 10708 hectors are under irrigation.

**3. Malangaon project:**

It is located in the Sakri tehsil, near Malangaon village. It was finished in 1969. The total cost of the project was Rs. 74.21 lakh. The dam's height is 23.71 meters. The project is intended for a total command area of 2877 hectors and serves 1587 hectors for irrigation.

**4. Burai Project:**

Village Phofade is the closest hamlet to the Burai project in Sakri Tehsil. It was ready to service in 1984 for a cost of Rs.884 lakh. The dam's length and height are 888 metres and 30.6 metres respectively. The dam's gross storage capacity is 14.21 million cubic meters. It irrigates a net area of 2161 hectares. The canal's length is 16.4 kilometers.

**5. Jamkhedi Project:**

Costing Rs. 3527.2 lakh, this project spans over Jamkhedi Nala in Sakri Tehsil. The project's catchment area is approximately 19.91 square kilometers, and the back water occupies 281 hectares of land. The dam's total storage capacity is 13.28 million cubic meters, which is used to irrigate 2750 hectares of land.

**6. The Karvand Project:**

It is located 9 km north of Karvand hamlet in Shirpur tehsil. It was created in 1969 over the Arunavati River. At that time, the project cost Rs.169 lakh. The dam is 36.27 meters high and 1.357 kilometers long. The gross command area is 8266 ha, while the net irrigable area is 4534 hectors. The total length of the canals is 24.28 kilometers.

**7. Aner Project:**

Located on the border of Dhule and Jalgaon districts, near Mahadeo Dondawada hamlet in Shirpur Tehsil. It was finished in 1979. The total cost of the project was Rs.1328.22 lakh. The dam is 2.125 km in length and 49 metres in height. The dam has a gross storage capacity of 103.45

**8. Sonvad Project:**

This is a recent medium irrigation project in the district. It is located in the Shindkheda Tehsil. The project cost Rs 2880 lakh. The Sonvad dam's height and length are 16.5 and 512.2 meters respectively. The dam has a gross storage capacity of 17.52 million cubic meters. The gross command area is 5833 hectares, whereas the net irrigable area is 756 hectares.

**9. Sulvade Project:**

Barrages are built across the Tapi River at Sulvade hamlet in Shindkheda tehsil. It was erected in 2008 at a cost of Rs. 694804 lakh. The project's height and length are 133 and 500 meters, respectively. The project has a gross storage capacity of 6.506 million cubic meters. It irrigates 20 villages in Shindkheda Tehsil.

**10. Shevade Dam:**

Currently under construction and expected to be finished. Shevade is the closest hamlet to the project in Shindkheda Tehsil. The total cost of the project was Rs. 9843.71 lakh. The dam's height is 28 meters. The

projected canals are 31.44 kilometers long and will serve 36.92 million cubic meters of water to irrigate 7851 hectares of land. The project will sink around 5980 hectares of land.

**11. The Amaravati Dam:**

located in Shindkheda Tehsil, was completed in 2007. The dam's total height is 17.90 metres, and it stores 25.68 million cubic metres of water to irrigate 3292 hectares of agricultural land. This project is located in the most drought-prone area in the district.

## V. CONCLUSION

There is no single big irrigation project in the research region. There are twelve medium irrigation projects in the district. The gross commanded area is 771.45 square kilometers. In addition, there are modest irrigation projects that are effective for irrigation, percolation, and groundwater recharge. There are 71407 irrigation wells in the district. These wells also serve an essential irrigation purpose. The alluvial plain to the north of the Tapi River contains a large number of dug wells. Crops use the majority of the available water supply (743.826 M.Cu. M), accounting for 2326.155 M.Cu. M. Aside from that, water supply (drinking) requires 34.923 M.Cu. M. Industries additionally require 37.191 M.Cu. M., resulting in a shortfall of 1665.687 M. Cu. M., water.

## VI. REFERENCES

[1] Agriculture College, Dhule.

[2] Dhule District Agriculture Department.

[3] Aurangabadkar, K. P.(1990) : Investigation of Potential Areas For Artificial Recharge in Burai Basin, Dhule District, Proceeding Volume , All India Seminar on “Modern Techniques Of Rainwater Harvesting, Water Conservation and Artificial Recharge for Drinking Water, A forestation, Horticulture and Agriculture” organized by G. S. D. A. Pune.

[4] Rai, D. K.(1993): Systematic Hydrological Surveys in Parts of Dhule District, Maharashtra by C.G.W.B.

[5] Limaye, Shrikant D. (2010): Review: Groundwater development and management in the Deccan Traps (basalts) of western India, Hydrogeology Journal, Vol.18, No.3, pp.543-558.

[6] Maggirwar, C. N. (1990) : Investigation of Potential Areas For Artificial Recharge in Burai Basin, Dhule District, Proceeding Volume , All India Seminar on “Modern Techniques Of Rainwater Harvesting, Water Conservation and Artificial Recharge for Drinking Water, A forestation, Horticulture and Agriculture” organized by G. S. D. A. Pune.

[7] Mahajan, Gautam (2009): Groundwater-Survey and Investigation, A P H Publishing Corp., NDL.

[8] Mamoria, C. B.(1975) : Geography of India (Agricultural Geography), Shiv Lal Agrawal and Co. Agra.

[9] Mehta, Kiran V. (2010): Physicochemical Characteristics and Statistical Study of Groundwater of Some Places of Vadgam Taluka, Banaskatha District of Gujrat State, India, J. Chem. Pharm. Res., Vol. 2, No. 4, pp. 663-670.

[10] Michel A. M. (2005): Irrigation: Theory and Practices, Vikas Publishing House, New Delhi, pp. 40-45 and 75-76.

[11] Mishra, A. K. and Mishra, A. (2006): Groundwater Quality Monitoring in Shallow and Deep Aquifers in Saidabad Tahsil Area, Mathura District, India, Environment Monitoring and Assessment, Vol.117, No.1-3 pp. 345-355.

[12] Dr. S. C. Gorane, Ph.D. Thesis entitled “Potential, Utilization and Problems of Water Resources in Dhule District (M.S.)”

[13] Mishra, Kavita and Kumra, V. K. (2007): Hydrogeomorphological Approach in Water Resource Management in Part of Chandraprabha Basin, Vindhyan Upland, Eastern UP, National Geographical Journal of India. Vol. 53, No. 1-2, pp. 61-72.

[14] www.google.co.in.