

Availability of Water and Socio-Economic Development: A Comparative Study of Pune and Aurangabad Divisions of Maharashtra State

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Introduction:

The development of the human race is always dependent on water as is evident from history. All the civilizations are developed along the banks of major rivers in the world. Water is required for nearly all human activities and the survival of human beings cannot be imagined without the availability of water. India is the second largest populated country in the world and is estimated to be the first till the end of the current decade. This growing population needs more water to satisfy its needs. By the year 2025, India is expected to use 105 mham annually; up from 38 mham annually in 1974 (Nag, 1975). The problems related to the availability and accessibility of water is faced by all the countries in the world. About 80 countries comprising 40% of the world's population already suffer from serious water shortages (Ashok Nigam, 1998) and the problem is projected to become severe with time. Projected estimates indicate a huge demand-supply gap of water in all the major river basins by 2030 (GoM, 1999). The problem in India is more serious. Nearly 44 million people in India are affected by water quality problems either due to pollution, the prevalence of fluoride, arsenic, and iron deposits in groundwater, or due to the Ingress of seawater into groundwater aquifers (Ashok Nigam, 1998). The available water is also not up to the quality standards required for human consumption. 30 percent of urban at 90% of rural households still depend on untreated surface or groundwater (Srikanth, 2009). Nonavailability of quality water for consumption results in health and economic losses. 37.7 million Indians are affected by waterborne diseases annually, 1.5 million children are estimated to die because of diarrhea control and 73 million working days are lost due to waterborne diseases each year. the resulting economic burden is estimated at 600 million US dollars a year (Srikanth, 2009).

The availability and accessibility to water and irrigation facilities are also uneven in different parts of the country. The dimensions of inequality analysed include: inequality in access to common pool groundwater resources (both inter-generational and intra-generational inequality); inequality caused by monopolistic groundwater markets; inequality in access to common property water from river catchments; inequality in access to subsidized water from public irrigation schemes; and inequality in access to water from municipal water supply systems (Kumar & R. Maria Saleth, 2018).

The present paper is analytical in nature and tries to explore the situation of water availability and its effects on the socio-economic development of two regions of the state of Maharashtra namely Pune and Aurangabad. Secondary data collected from various sources is used for the analysis. The parameters used for the study are the availability of irrigation facilities, the incidence of poverty, HDI, District Total product, and district Per Capita Income.

Objectives:

1. To study the availability of irrigation facilities in the Pune and Aurangabad Regions
2. To study the incidence of poverty in the Pune and Aurangabad Regions

3. To study the socio-economic development of the Pune and Aurangabad Regions

Availability of water and irrigation facilities

Availability and accessibility to water play a major role in determining the standard of living of the people in the country. In India rainfall is the primary source of water for all the regions. The rainfall in India is uneven as some parts of the country receive heavy rainfall and some are facing droughts continuously due to less rainfall. In Maharashtra, Aurangabad is the region that receives less rainfall compared to other regions over the many years.

Table no 1: Normal and Actual rainfall

Year	Pune		Aurangabad	
	Normal Rain (mm)	Actual Rain (mm)	Normal Rain (mm)	Actual Rain (mm)
2011	1122	1162.2	800.3	704.2

2013	1122	924.1	800.3	1010.6
2014	1122	923.7	800.3	556.4
2015	1122	639.3	800.3	605
2016	1122	896	800.3	903.5
2017	1122	916.8	800.3	677.2
2019	1122	1352.7	800.3	845.4
2020	1122	1141.5	800.3	951.1

Source: Data Collected from the District Economic Surveys

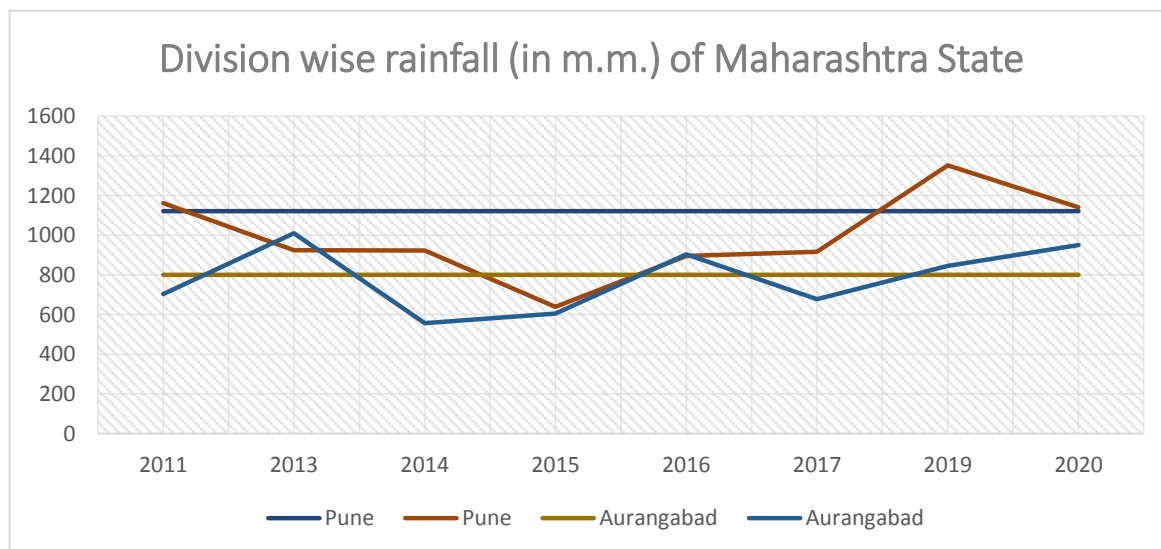


Chart 1: Division-wise rainfall (in m.m.) of Maharashtra state

Table 1 and chart 1 show the comparison of average and actual rainfall between the Pune and Aurangabad Regions of the state of Maharashtra for the duration of 2011-2019. The average annual rainfall of the Pune region is 1122 mm and the average rainfall of the Aurangabad region is 800 mm which is considerably less compared to the Pune region. Except 2013 and 2016, the actual rainfall in the Pune region is consistently greater than in the Aurangabad region. This fact makes it clear that the availability of water is less in the Aurangabad region compared to Pune.

Access to water depends upon water management. Some parts of the world which receive very less rainfall have successfully managed the available water for their needs. Irrigation facilities play a dominant role in determining access to water. The major and medium storage system of surface irrigation has a crucial role to play in water-scarce, drought-prone, seasonal rivers, flowing regions like Marathwada. These systems are expected to provide sufficient water supply to sustain the expected current level of agricultural development (Mitra, 1998).

Table no. 2: Availability of Irrigation and water supply facilities			
Sr. No.	Particulars	Regions	
		Aurangabad	Pune
1	Number of Districts	8	5
2	Number of Large Projects	17	36
3	Average no. of large projects per districts	2.12	7.2
4	Medium Projects	82	52
5	Small Projects (State)	799	391
6	Small Projects (Other)	2609	4157
7	Percolation Dams	9276	5500
8	Kolhapuri Dams	3399	3033
9	Storage Dams	4775	4727
10	Upasa Jal Sinchan Yojana	68	167
11	Wells	190378	218414
12	Diesel Pumps	9460	4722
13	Electric Pumps	877056	1216431

Source: Data Collected from District Economic Surveys 2020

Incidence of Poverty

Poverty is defined as a situation where people are unable to fulfill their basic needs such as food, cloth, shelter, health, and education. Government of India has formed various committees for the calculation of poverty line and measurement of incidence of poverty in the country. According to Tendulkar Committee estimates, "The percentage of persons below the Poverty Line

in 2011-12 has been estimated as 25.7% in rural areas, 13.7% in urban areas and 21.9% for the country as a whole. The respective ratios for the rural and urban areas were 41.8% and 25.7% and 37.2% for the country as a whole in 2004-05. It was 50.1% in rural areas, 31.8% in urban areas and 45.3% for the country as a whole in 1993-94. (Poverty Estimates for 2011-12, 2013)

Table no. 3: Percentage and Number of Poor Estimated by Tendulkar Method						
	Poverty Ratio			Number of Poor (in millions)		
	Rural	Urban	Total	Rural	Urban	Total
1993-94	50.1	31.8	45.3	328.6	74.5	403.7
2004-05	41.8	25.7	37.2	326.3	80.8	407.1
2011-12	25.7	13.7	21.9	216.5	52.8	269.3

Source: https://niti.gov.in/planningcommission.gov.in/docs/news/pre_pov2307.pdf

In Maharashtra, the incidence of poverty varies in different parts of the state. For the two regions chosen for study, there is a difference in the incidence of poverty. As is evident from table no. 4 and chart 2, in Aurangabad Region, 28.99 percent of households are living below poverty line in rural areas whereas 33.28 percent of households are below poverty line in the urban area. The same numbers for the Pune region are 19.76 percent for rural areas and 20.5 for urban areas. The comparison between the two regions shows that in the Aurangabad region the incidence of poverty in rural areas is more by 9.23 percentage points and in urban areas, it is more by 13.23 percentage points.

Table no. 4: Percentage of Households Below the Poverty line (Rural and Urban)

Regions	District	Percentage of Households BPL (Rural)	Percentage of Households BPL (Urban)
Aurangabad	Aurangabad	28.7	7.26
	Latur	29.81	26.05
	Osmanabad	32.82	34.76
	Parbhani	30.46	34.68
	Nanded	10.45	33.21
	Beed	26.85	33.81
	Jalna	38.35	38.86
	Hingoli	34.53	57.62
Aurangabad Total		28.99	33.28
Pune	Pune	19.5	1.4
	Satara	15.97	26.32
	Solapur	29.31	24.19
	Sangli	16.6	NA
	Kolhapur	17.6	28.3
Pune Total		19.76	20.05

Source: Data collected from District Economic Surveys of 2020

PERCENTAGE OF HOUSEHOLDS BELOW POVERTY LINE (RURAL AND URBAN)

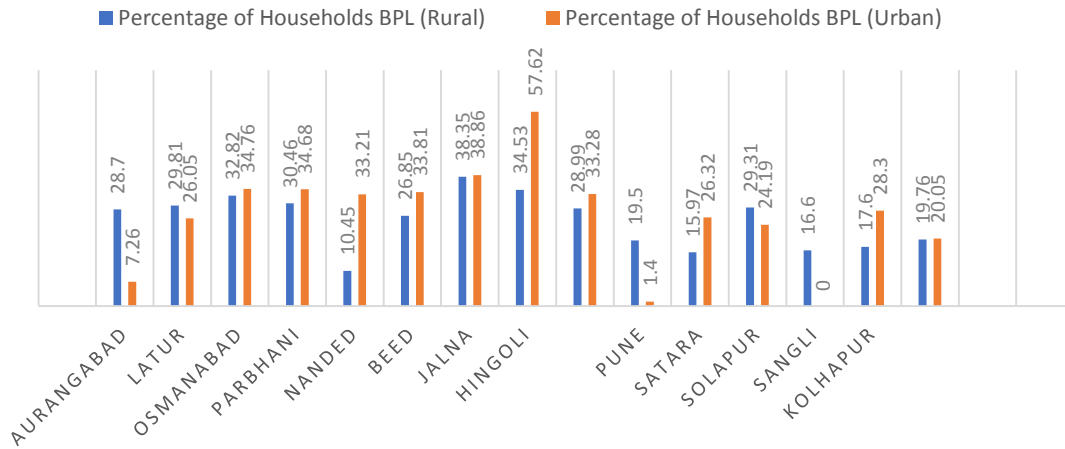


Chart 2: Percentage of Households Below Poverty Line (Rural and Urban)

Socio-Economic Development

District Total Product and Per Capita Income The Socio-Economic Development of the country is measured in terms of various parameters such as Domestic Product, Per Capita Income, HDI value, etc. India is currently the 5th largest economy in the world with a size of more than 3 trillion dollars, but According to the International Monetary Fund (IMF), on a per capita income basis, India ranked 142nd by GDP (nominal) and 125th by GDP (PPP) in 2022. In India, Maharashtra ranks 1st in terms of GDP and 9th in terms of GDP Per capita. It is one of

the most industrialized states in the country and contributes about 20% of the national industrial output. But there exist wide inequalities in terms of District Total Product and Per Capita Income between different districts in Maharashtra. An examination of the regional profile indicates that all the districts of western Maharashtra with the exception of Dhule were classified as belonging to medium and high levels of development. In sharp contrast, all the districts in Marathwada, except Aurangabad, and six out of nine districts in Vidarbha were classified as belonging to the category of the underdeveloped district (Prabhu & Serker, 1992)

Table no. 5: District Total Product and Per Capita Income			
Stable prices 2011-12			
Regions	District	Net Total Product (in crores)	Net PCI (in rupees)
Aurangabad Region	Aurangabad	21423	62046
	Latur	9959	41314
	Osmanabad	6341	37419
	Parbhani	6861	38120
	Nanded	NA	38120
	Beed	8709	35185
	Jalna	7245	39125
	Hingoli	3173	28196
Aurangabad (Average)		9101	39940
Pune Region	Pune	91241	101687
	Satara	80559	54178
	Solapur	23725	52305
	Sangli	31070	103588
	Kolhapur	29789	72917
Pune (Average)		51276	76935
Source: Data Collected from District Economic Surveys of 2020			

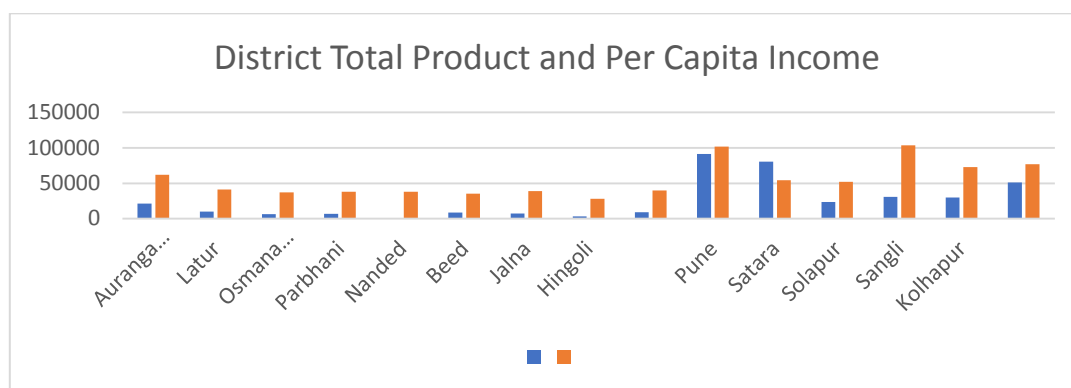


Chart 3: District Total Product and Per Capita Income

Table 5 and Chart 3 shows the District's Total Product and Per Capita Income for the year 2020 at stable prices of 2011-12. The average Net Total Product in Aurangabad Region is 9101 crores whereas in the Pune region it is 51276 crores which shows a huge gap in the total income of the Pune and Aurangabad regions. The same is the situation in the case of Per Capita Income (PCI). Net Per Capita Income in Aurangabad Region is 39940 Rupees and in the Pune region, it is 76935 rupees which are almost double that of the Aurangabad Region. There are variations among different districts in terms of District Total Product and PCI. In

Aurangabad District, the Total Product Stands highest at 21423 crores and it is the lowest for Hingoli i.e. 3173 crores only. In the Pune region, the District Total Product is higher for Pune district i.e. 91241 crores, and lowest for Solapur District 23725 crores.

Human Development Index 2011

The Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living. The HDI is the geometric mean of normalized indices for each of the three dimensions. HDI is used worldwide to measure the standard of living of households in different countries in the world.

Table no. 6: Human Development Index 2011			
Sr. No.	District	HDI Value 2011	Category
Aurangabad Region	Aurangabad	0.727	High
	Latur	0.663	Low
	Osmanabad	0.649	Low
	Parbhani	0.683	Medium
	Nanded	0.657	Low
	Beed	0.678	Medium
	Jalna	0.663	Low
	Hingoli	0.648	Low
Pune Region	Pune	0.814	Very High
	Satara	0.742	High
	Solapur	0.728	High
	Sangli	0.742	Very High
	Kolhapur	0.770	Very High
Source: https://mahasdb.maharashtra.gov.in/docs/pdf/mhdr_2012.pdf			

India Ranks at 132nd position out of 191 countries in the world in terms of HDI. Human Development within different states and districts is uneven in India. Table no. 6 makes it clear that in the Aurangabad region out of 8 districts only one district i.e. Aurangabad stands in the category of High

Human Development and five districts namely Latur, Osmanabad, Nanded, Jalna, and Hingoli stand in the 'Low' human development category. In the Pune region three districts namely Pune, Sangli and Kolhapur stand in the 'Very High' category of HDI and two districts stand in the 'High'

HDI category, there is no district categorized as low or very low HDI.

Findings and Conclusion

It is observed that the availability and accessibility of water and development are closely related to each other. The study finds that the regions having higher rainfall and irrigation and other water supply facilities are far better in socio-economic and human development. Pune region enjoys considerably higher rainfall than the Aurangabad region, the average rainfall of the Pune region is 1122 mm and for the Aurangabad region, it is 800.3 mm with wide variations among the different districts. The incidence of poverty is also low in the Pune region in both rural and urban areas compared to Aurangabad Region. In terms of socio-economic development in parameters like District Total Income, Per Capita Income, and HDI Pune is far ahead of Aurangabad Region.

The study finds significant differences in terms of availability and accessibility of water, the incidence of poverty, and socio-economic development between the Pune and the Aurangabad Regions. Hence null hypotheses are rejected and alternate hypotheses are accepted.

From the above findings, it can be concluded that the availability of water and development in terms of different parameters are closely related to each other. A well-planned and well-developed water infrastructure in emerging countries will contribute to developing economies in their own right. Moreover, it will provide 'stronger and more stable platform for growth' (Morgan, 2014).

Hence for the holistic development of various regions of the state, planning and strategies for proper management of water resources and improvements in availability and accessibility to water are needs to be included in policy decisions.

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Abbreviations

1. Mham : million hectare meters