

## COMPREHENSIVE STUDY ON INTERACTION OF LAND WITH WATER RESOURCES FOR WATER SUSTAINABILITY: SPECIAL REFERENCE TO AURANGABAD DISTRICT (MAHARASHTRA)

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### ABSTRACT

Water is the most critical limiting factor for many aspects of life like economic growth, environmental stability, biodiversity conservation, food security and health care. The sources of freshwater supplies – ground water, reservoir, and rivers- are under sever and increasing environmental stress because of overuse, water pollution and ecosystems degradation. India has the monsoon restricted with three to four months. The present study is an attempt to the changeable climatic condition and water resources of an Aurangabad district. The empirical approach has been one of the basic considerations to generate the primary data for the study. It will analyse the distributional characteristics of water sources and receiving rainfall availability in the nature. In the present research paper, only study the water sources and their use which faces problems and its impacts on regional disparity.

**Keywords:** Environmental Stability, Biodiversity, Environmental Stress, Ecosystem Degradation, Water Sources, Sustainable development.

### I. INTRODUCTION

The study of Water resource of a district has become more important in the contexts of present global changes and perspectives on water politics. The Present study is carried out to investigate the water uses of various purposes according to the available stock in the dams and nature. Such a study falls very much in the preview of Resources Geography. This study will also focus on water savage management and their impact on regional disparities. It is intended that such study will also enrich the role of famine geography. Only pure H<sub>2</sub>O (water) can interact with organisms. Every country's development depends upon the water availability. Need of water to Agriculture, Industries, and Households etc. Present study carried out the Physical feature of study area, slope, LULC of study area, water supply and SWOT analysis. This research paper will helpful to researcher and academicians for knowledge enhancement.

### II. SURVEY OF LITERATURE

**James W LaMoreaux (2020)**, the Peer – reviewed journal on “ Sustainable Water Resource Management (SWAM)” deals with the interface of water resources and the needs of human populations and addressing practical methods and basic research in groundwater management and surface water resources quantity and quality. Sustainability of water resources, water- availability and also geo- political and socio-economic aspects of water resource management discussed.

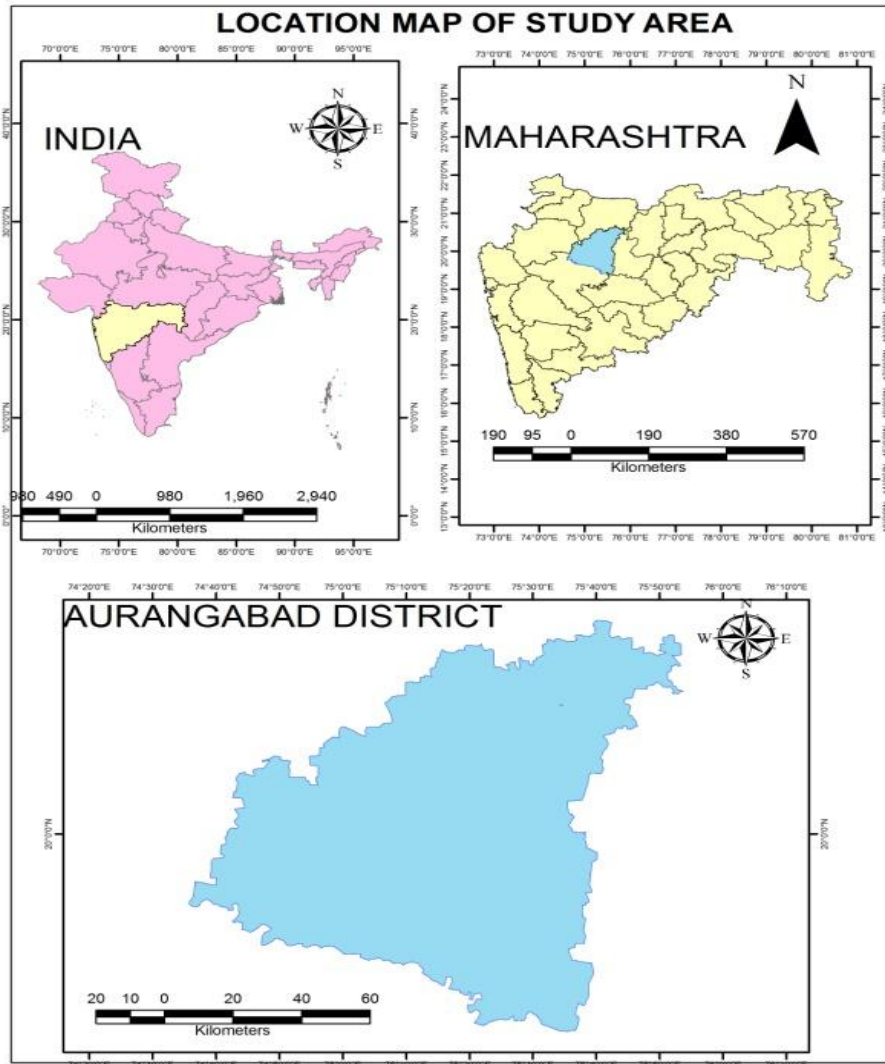
**Daniel P and Van Beek (2017)**, book on “Water Resource systems: Planning and Management” offers guidelines for initiating and carrying out water resource systems planning and management projects. Author's observed that alternative optimization, simulation and statistical methods useful for project identification to design operation and evaluation for studying post planning issues.

**S.D. Shinde K.A. Patil e .tal (2016)**, article on “Assessment of River and Groundwater Quality and its sustainability for Domestic uses in Aurangabad Maharashtra” discussed the three main source of the river and groundwater pollution in study are which includes domestic waste disposal activities, industrial effluent disposal and non point activities. The study of research indicates groundwater of the area contaminated due to anthropogenic activities and water availability status.

**S.N. Chaterjee (2008)**, his book on “Water Resources, Conservation and Management” he state that, Water is the most essential component for the very existence of life on the earth.. Every year about 4,

53,000 cubic kilometers of water are evaporated from the surface of the worlds ocean. Approximately 90 per cent of volume returns to the ocean as precipitation, 41,000 cubic kilometers, is transported winds, 72,000 cubic kilometers of water evaporated 113,000 cubic kilometers. It is this annual cyclical flow of water sustains life.

**A] Location of Study area**

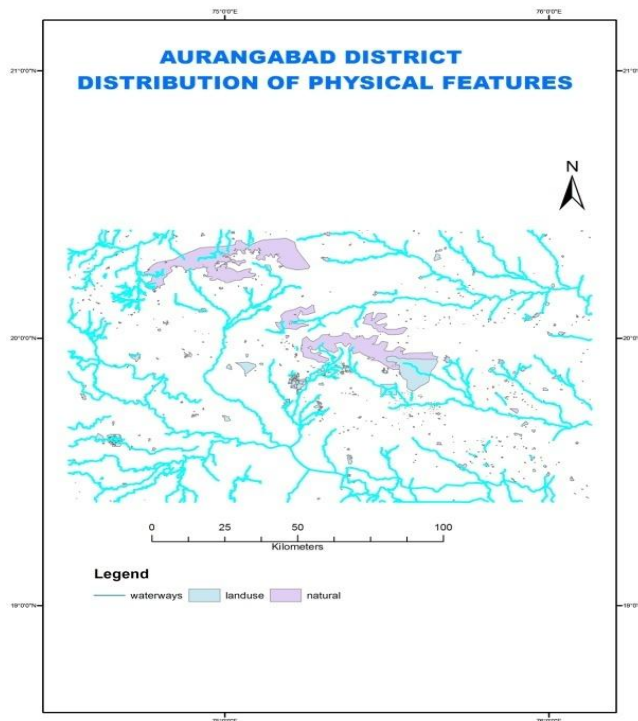


The region selected by researcher for the research work is Aurangabad District. The Aurangabad District consists in the Maharashtra state situated in western India. The Maharashtra state is divided into six division viz., Konkan, Nashik, Pune, Amravati, Nagpur and Aurangabad. The Aurangabad division known also as Marathwada was formerly a part of Hyderabad state. Aurangabad district is situated in the north central part of Maharashtra lies between North latitudes  $19^{\circ} 15'$  &  $20^{\circ} 40'$  & between  $74^{\circ} 30'$  and  $76^{\circ} 33'$  East longitudes. It covers area of 10,107 sq.km [46 L & P and 47 I & M. Toposheet No.]

**(i) Physical feature:**

The Aurangabad district is a part of the Deccan plateau slopes according to south-east from the Sahyadris has many features in common with other districts of the Deccan or like location. East raising steeply the Ajanta plateau begins with elevations of over 900 metres and slopes gently eastwards to be drained by the Purna and its tributaries.

Antur (2704 ft. or 826 metres), Sutonba (1812 ft. or 552 metres), Abasgadh (2202 ft. or 671 metres), Baithaulvadi (2052 ft. or 625 metres) and Ajanta (1897 ft. or 578 metres).



(ii) Rivers : - The rivers of the district may be grouped into three classes :

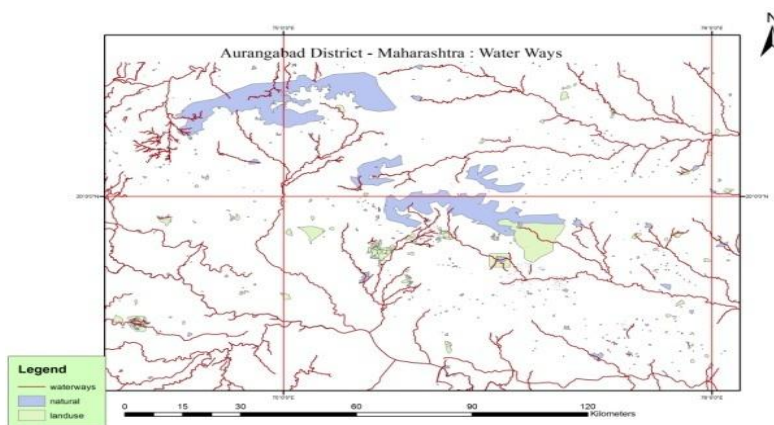


Table No.1.

| Particulars             | Area          | Particulars                              | Area                |
|-------------------------|---------------|--|---------------------|
| Total Geographical Area | 10,107 Sq.km  | Rain fed area                            | 5.0 Lakh ha.        |
| Forest Area             | 814.15 sq.km  | Gross Area irrigated                     | 2.0 Lakh            |
| Area under cultivation  | 8.15 Lakh ha. | Area irrigated by surface water          | 8.65 Lakh ha.       |
| Net sown Area           | 72 Lakh ha.   | % of cultivated area and by ground water | 15% cultivated area |

Source: Maharashtra Jeevan Pradhikaran, Aurangabad.

**(iii) Water Status in Aurangabad District:** - According to the natural geomorphologic conditions, the district is having total area 10,107q.km which is spread over 52 watersheds, needs to be considered in three groups –

- 5375 sq.km area coming under the Godavari sub basin covering 23 watersheds.3572 sq.km area coming under Purna sub basin comprising 19 watersheds.
- 1159 sq.km area coming under Tapi sub basin comprising 10 watersheds.
- The average annual rainfall of these 3 subgroups is 608.44mm, 564.28mm, 778.89mm respectively.

**(iv)Water Supply:-**

1. Domestic water supply: - 26 % of the rural population is fully covered, 66% are partially covered and 8% is not yet covered.
2. Sewage and waste water treatment: Raw sewage is directly discharged in the river.
3. Solid Waste Management: - In rural and urban areas of Aurangabad District, solid waste management is not scientifically practiced.
4. Water Quality and Health status of Aurangabad: - Due to the lack of adequate water and sanitation facilities major rivers in the district are highly polluted.

**(v) Ground Water Supply:** - Ground water is an important source of water irrigation. Presently the gross irrigated areas are 2.00 lakh ha. And 65% of the area is irrigated by using ground water sources like tube/bore wells and dug wells.

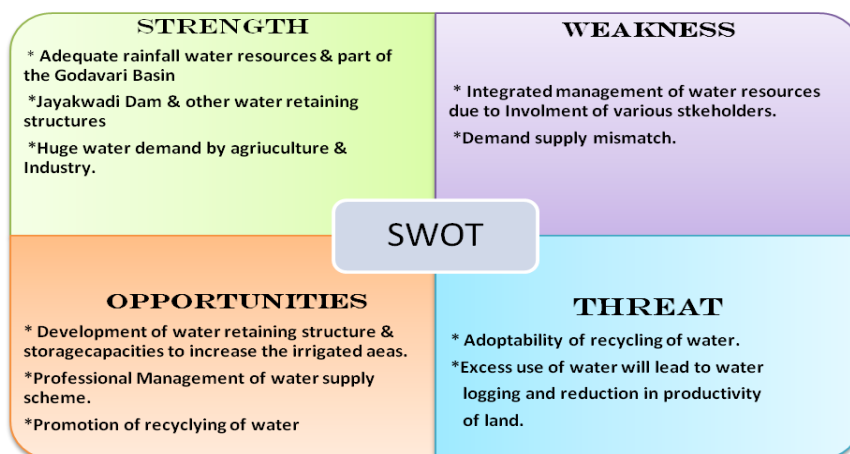
**(vi)Industrial Use:** - Aurangabad district has four major industrial areas. Industries require fresh water for processing, cleaning for domestic use within the industrial premises. An industrial water supply scheme has been constructed by MIDC at Walunj.

**(vii) Water for Environment:-** For maintaining aquatic ecology, retaining, minimum flow in the rivers is essential.

**(viii) Water Resource Development:** The quantity of average annual precipitation of water is 6189mm<sup>3</sup> but the average annual surface flow is around 1881mm<sup>3</sup>, this indicates that the absorption and desiccation loss through the land surface is very high.

❑ **Problems of Water resource on region:** Majority problems depend upon the rainfall and changeable climatic condition. The Eastern part of the district newly comes under drought because less than 35% rainfall received last five years. Due to lack of water supply, its impact on district development as per the economic and revenue as well as agriculture sectors.

**SWOT Analysis**



### III. STATEMENT OF PROBLEM

The Study area exhausting by water supply and groundwater availability and weather condition. Rural Villages experiencing water shortages is to wait until there is a problem for water scarcity. The districts of study area have been facing acute shortage of water, even during the on-going monsoon season. The areas include Gangapur, Vaijapur and tehsils limits of Aurangabad. The district as a whole comprising nine talukas gets a supply of 326 tankers on daily basis, several villages and hamlets still reel under water crisis. The Average rainfall of study area is 176mm so far, which accounts for 26% of average annual rainfall.

The climate of the study area is hot summer and generally occur dryness through the year except during the south west monsoon season, which is from June to September and October to November constitute as a post monsoon season.

### IV. HYPOTHESIS

The following are certain hypothesis, which have been formulated for present study:

- The water or hydrologic cycle interacts with lithosphere, hydrosphere and biosphere.
- Atmosphere can no longer with clouds; then, we experience with rain, snow, hail, or sleet.
- Water producing the melts in the spring, runoff that percolates through the groundwater (subsurface) or makes its way back to the sea (surface).

### V. OBJECTIVES

The present study focuses on the sources of water and their use for infrastructural purposes.

- To know the water supply scheme, Irrigation projects, Water use efficiency.
- Water Resource development as well as impacts on regional disparity to water available areas
- To prepare a SWOT analysis by the findings on the discussion.

### VI. METHODOLOGY

The present study is primarily based on data collected through questionnaire and field work. The case study of the water resources is undertaken in two ways firstly, geographical approach is done to gather information of water uses which availability in the regional perspectives. Secondly, in order to study the composition of various rivers and land catchment area and other characteristics like flowing side of river, density, hydal power generation project, infrastructural purposes etc. For this research paper, secondary data has used including journals, magazines and reference books. In order to assess education performance to effective planning and designing for decision makers were collected and processed to summarizing succeeding pages.

### VII. RESULT AND DISCUSSION

Establish minimum flow in the rivers, some token quantities will have to be allocated for the main tributaries like, Shivna, Dev, Sukhana, Purna, and Waghur having their catchments area more than 500 Sq.km each. To achieve that, spillway gates to the respective reservoirs will have to be established to ensure additional storage.

### VIII. CONCLUSION

On the basis of above discussion it can be concluded that, In the Aurangabad district have more than 20 rivers but it flow depends upon rainfall and climatic condition. The area has a rich in Urbanization and Industrial. It is noticed that Aurangabad district is faster growth in Urbanization in our country, but such type of thing directly impacts on local regional disparity. The local governmental policies on conservation are run effectively but participation of regional human being is very low. The drought and desertification problems come in the district due to lack of water. The water resource is coming in natural process but we have to use it in proper channel for its benefits to suitable purposes.

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