

A Study of water Resources in Maharashtra

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Abstract

The area of the state is covered by five major river basins namely Godavari, Krishna, Tapi, Narmada and West Channel river basins. Also a very small area in the north eastern part of the state falls in the Mahanadi basin. The estimated average annual availability of water resources of the state is 198 billion cubic meters, which includes 164 billion cubic meters of surface water and 34 billion cubic meters of groundwater. As of June 2017, a storage capacity of 42.85 cubic meters has been created through the State Level Water Resources Project. Except the western channel rivers, the basin of the remaining four rivers is shared with Maharashtra and adjoining states. Due to judgments, agreements and decisions related to inter-state river water disputes, the state has limited use of surface water resources of about 126 billion cubic meters, of which 69 billion cubic meters are in the West Channel river basin. The cultivable area of this region is very limited at 10.6 percent and comprises a narrow strip of fifty kilometres between the Sahyadri mountain range and the Arabian Sea thus limiting the local use of the total available water. The entire water available in the basins of the west flowing rivers cannot be utilized locally Also as the said basin is separated from the rest of the basin due to the mountain range of more than 610 meters, the excess water cannot be economically diverted to other basins as well. On the other hand, the basins of the remaining four rivers, which account for 89.4% of the cultivated area, have only 45 percent of the total water resources. As a result of this decision, about 42.50 percent of the state's area falls under the deficit or super deficit basin. The state faces frequent water scarcity and drought. The state is mainly divided into 1531 watersheds taking into account the boundaries of river basins and sub-basins. According to the catchment area wise groundwater determination made in 2013-14, the net groundwater availability is 31.84 billion cubic meters and the annual withdrawal is about 17.07 billion cubic meters.

Key words

River basin, Irrigation, Water Resources

Introduction

The economic development of any country depends on the industrial sector of that country, but for the industrial sector to develop, the agricultural sector must also develop. Water supply, electricity, transport system, credit supply, marketing system and abundant inputs are essential for the development of agriculture sector. The basic purpose of irrigation is to enrich rural life by increasing agricultural production. Similarly, the increasing population, increasing number of industrial sectors and other reasons are increasing the demand for water in recent times, and especially in the goals of sustainable development, the focus on water conservation has also been indicated

Maharashtra occupies the western and central part of India and the state enjoys a coastline of about 720 kilometres along the Arabian Sea. With a population of 11.24 cores and a geographical area of 3.08 lakh square kilometres according to the 2011 census, Maharashtra ranks second in terms of population and third in terms of geographical area in the country. The state is highly urbanized with 45.2 percent of the population living in urban areas. The state has a tropical monsoon climate. There is a great variation in the pattern of rainfall in the state in terms of location and duration. The average annual rainfall in the state ranges between 400 to 6000 mm. The state is experiencing frequent drought conditions almost 42.50 percent of the area is prone to drought. As per 2015-16 the total area under crops in the state is 22.9 million hectares and the area under sowing is 17.9 million hectares and the area under more than one sowing is 5.92 million. Half of the population of the state Depends on agriculture.

Objectives of the Research: -

1. To review the agricultural sector of the state.
2. To study the water resources of Maharashtra.
3. To study the Pradhan Mantri Krushi Sinchayee Yojana

Research Methodology:

This paper is prepared with the support of secondary sources like magazines, newspapers, books, various articles, Economic journals and various Economic survey of Maharashtra, report of

water resources department govt. of Maharashtra Maharashtra.
 and Agricultural commisonarate govt. of

Number of Major, Medium and Minor Irrigation Projects, Produced Irrigation Capacity and Irrigated Area

| Particulars | Projects of Water Resources Department | | | Number of minor irrigation projects (local sector completed & ongoing) | Total (K.T. Weirs, Lift Irrigation schemes, Other important types ,I M.I. Tanks ,Percolation tanks) | Total State level & Local level |
|---|--|-------|--------------|--|--|---------------------------------|
| | Major & Medium | Minor | Total | | | |
| No. of projects completed & on-going as on 30th June, 2020 | 405 | 3,472 | 3,877 | 113618 | | 117495 |
| Irrigation potential (lakh ha) | | | | | | |
| (i)Irrigation potential created upto June, 2019 | 39.18 | 13.86 | 53.04 | 18.96 & June 2020 19.26 | | 72.00 |
| (ii)Area under irrigation by canal & river during 2019-20* | 19.57 | 7.03 | 26.60 | - | | - |
| (iii)Area under irrigation by wells in command area during 2019-20* | 11.79 | 2.13 | 13.92 | - | | - |
| Total irrigation potential utilised during 2019-20 (ii+iii)* | 31.36 | 9.16 | 40.52 | 8.63 | | 49.15 |

Source: - 1) Chief Auditor, Water and Irrigation, Aurangabad under Water Resources Department 2) Office of the Chief Engineer, Minor Irrigation (Local), GoM

The above table shows the number of Major, Medium and Local Level Minor Irrigation Projects under the Water Resources Department, Government of Maharashtra as well as Irrigation Capacity Created and Area Irrigated. The table shows that the number of completed and on-going major medium and minor irrigation projects as on 30 June 2020 is 3877 Similarly, the number of local level Kolhapur Dams, Ursa Jalsinchan Scheme, Pazar Lakes and all other types of important sources is 1, 13,618. Both state level and local level together have 1, 17,495 major, medium and minor projects and other sources.

The table shows that as on June 30, 2019, 53.04 lakh hectares under irrigation projects of the Water Resources Department in the state and 18.9 lakh hectares of irrigation potential at the local level were created and a total of 40.52 lakh hectares under irrigation in this year 2019-20. While under the local project 8.63 lakh hectare areas got the benefit of irrigation, the total irrigation capacity for 49.5 lakh hectare area was utilized. Overall, it can be seen that 76% of the irrigation potential of the irrigation projects at the state level is utilized while at the local level approximately 35% of the irrigation potential is utilized.

Live storage of water, irrigation potential and actual irrigated area

| Year | Storage capacity as per project design (MCM) | Live storage as on 15th October(MCM) | Percentage of live storage | Irrigation potential created (as on 30th June) (Lakh ha) | Actual irrigated area (1st July to 30th June) (Lakh ha) | Percentage of actual irrigated area to irrigation potential created |
|------|--|--------------------------------------|----------------------------|--|---|---|
| | | | | | | |

| | | | | | | |
|---------|--------|--------|------|-------|--------|------|
| 2015-16 | 42,960 | 17,712 | 41.2 | 49.10 | 24.07 | 49.0 |
| 2016-17 | 43,241 | 29,971 | 69.3 | 49.65 | 40.58 | 81.7 |
| 2017-18 | 43,752 | 27,607 | 63.1 | 50.37 | 39.42 | 78.3 |
| 2018-19 | 43,572 | 23,004 | 52.8 | 51.23 | 35.97 | 70.2 |
| 2019-20 | 44,183 | 30,579 | 69.2 | 53.04 | 40.52* | 76.4 |

MCM: Million Cubic Meters *Tentative

Source: Chief Auditor, Water and Irrigation, Aurangabad under Water Resources Department

The above table shows the useful water storage, irrigation potential and actual irrigated area in the state from 2015-16. The table shows that the available water storage in major, medium and minor Pat Dams state level reservoirs was 30,579 million cubic meters as on 15 October 2019. This

ratio was 70.2 percent of the total water storage capacity as per the project plan. The table shows that the percentage of actual irrigated area to constructed irrigation capacity is highest at 81.7% in the year 2016-17.

Total Irrigated area in the State

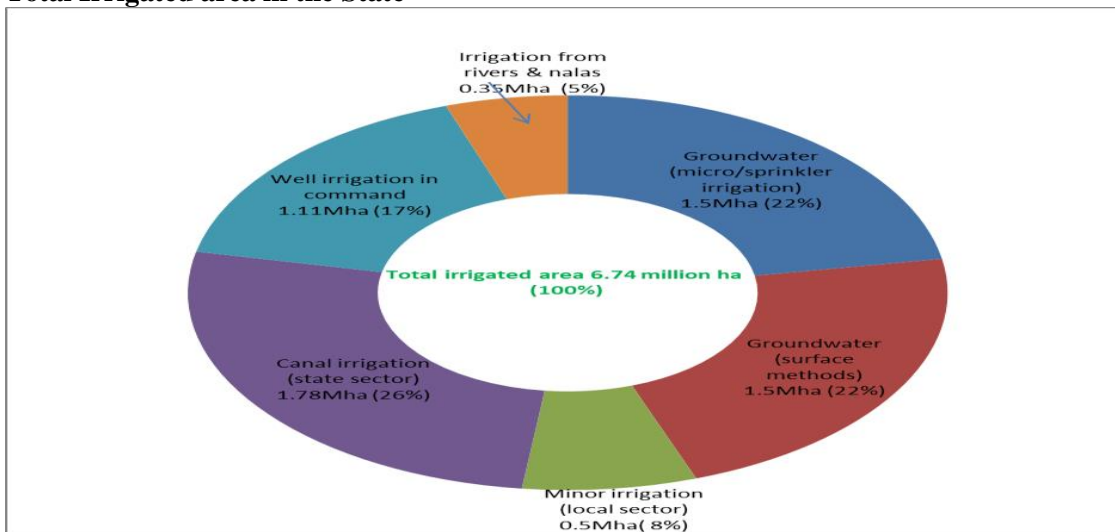


Figure - Area irrigated by surface and groundwater in 2014 from the state and local sector projects and groundwater in Maharashtra.

From the above pie chart it can be seen that in 2014-15, a total area of 6.74 lakh hectares was brought under irrigation in the state from state and local level projects considering both surface and ground water sources. Out of this, 1.78 lakh hectare through surface canal irrigation, 1.11 lakh hectare through wells in the dam area and 0.35 lakh hectare through river channel and 0.50 lakh hectare through local level minor irrigation, 3.74 lakh hectare is irrigated by ground water. While 1.50 lakh hectares were irrigated through ground water source through drip and sprinkler and 0.5 lakh hectare through surface water.

Pradhan Mantri Krishi Sinchayee Yojana

The main objective of the scheme is to increase cultivable area under assured irrigation, increase water use efficiency to avoid water wastage, precision irrigation and use of water saving irrigation methods like Sprinkler and drip irrigation (more crops per drop). This scheme is being implemented in the state from 2015-16. Under this scheme, there is a contribution criterion of 55 percent to small and marginal landholding farmers and 45 percent to other farmers and the area limit is five acres. In the year 2019-20, 1, 23,300 hectares of area came under micro irrigation.

Sprinkler & drip irrigation sets distributed and expenditure incurred

| Year | Sprinkler irrigation sets | | Drip irrigation sets | | Expenditure incurred (Corer) |
|------------------|---------------------------|-----------|----------------------|-----------|------------------------------|
| | No. of sets | Area (ha) | No. of sets | Area (ha) | |
| 2017-18 | 1,10,610 | 72,814 | 1,53,589 | 1,36,180 | 687.84 |
| 2018-19 | 71,161 | 44,812 | 1,03,921 | 85,731 | 415.95 |
| 2019-20 | 67,531 | 40,794 | 97,161 | 82,505 | 402.14 |
| 2020-21 (Target) | 69,979 | 63,617 | 1,21,685 | 1,10,623 | 667.66 |

Source: - Commissionerate of Agriculture, GoM

The above table shows the distribution and cost incurred of Sprinkler and drip irrigation sets. The table shows that more area has been brought under drip irrigation as compared to Sprinkler and drip irrigation sets. The total area of 1,74,240 hectare was targeted to be irrigated in 2020-21 as against 63,617 ha under Sprinkler irrigation and 1,10,623 hectare through drip irrigation.

Conclusion: -

Due to increasing population, per capita availability of water is decreasing and due to increasing urbanization and industrialization, there is increasing pressure on management. In September 2015, 193 member states, including India, committed to seventeen Sustainable Development Goals to be achieved over the next fifteen years. Water is firmly on the global agenda through Sustainable Development. Goal Six (SDG-6), which ensures “clean water and sanitation for all” ensuring a healthy standard of living, ending the problem of hunger, economic growth and other goals cannot be achieved without water. Apart from this, Sustainable Development Goals 12 and 15 (SDG-12 & 15) have also given importance to promote sustainable consumption

and production methods and sustainable use of the Terrestrial Ecosystem and therefore, effective development and management of water resources is very important to achieve the goals set out in the Sustainable Development Goals. Water availability in the state is heterogeneous. Large areas of the state are prone to drought while some small areas have abundant water availability. The situation is going to worsen in the face of potential threat of climate change. To avoid all this, it is necessary to conserve water along with efficient use of water

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