



Change in Ghod Dam water allocation and its impact on irrigation

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Abstract:

Since the completion of the dam construction in 1965, the Water Resources Department has divided the water seasonally so that an area of 25,253 hectares will be irrigated. A total area of 10117 hectares has been decided to be irrigated for Kharif season with 2833 hectares of right canal and 7284 hectares of left canal. A total area of 6879 hectares under left canal and 2023 under right canal during rabbi season. A total of 1943 hectares of irrigated under left canal and 486 hectares under right canal have been fixed for perennial crops. An area of 5666 hectares was allocated water under this method for bi-seasonal crops but as it was not possible to distribute water by this method till 1985, a new cropping structure was fixed on 17 May 1985. According to this, 20500 hectares of water will be irrigated according to the season, so after 1985 it was decided to distribute water to 8400 hectares for Kharif season, 9000 hectares for Rabbi Season, 1200 hectares for summer crops, 1000 hectares for bi-seasonal crops, 400 hectares and 500 hectares for crops of longer duration besides season.

Key word: - Ghod irrigation project, season, River Basin, irrigation

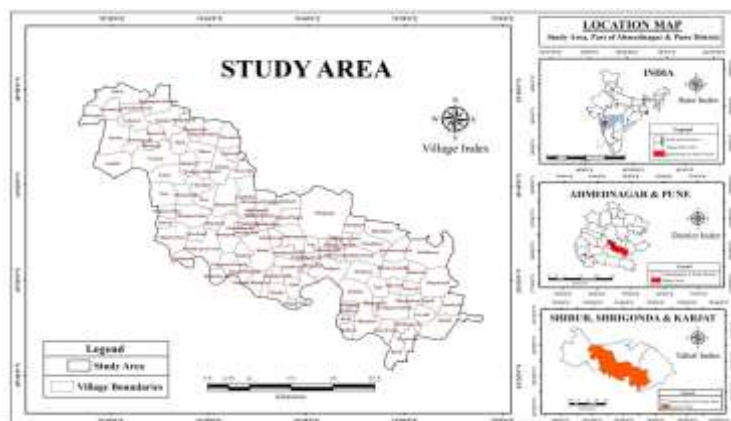
Introduction:

The Ghod River Basin plays a significant role in both Pune and Ahmednager district, providing essential support to diverse communities, agriculture, and the surrounding ecosystem. As the utilization of land and its environmental consequences continue to grow, the significance of the ghod irrigation project increases. The objective of this study is to gain insight into the utilization of land within the Ghod River Basin. Special expertise will be utilized to gather data on individuals' land utilization practices and its consequent impact on the environment. The Ghod River Basin, similar to numerous other locations globally, is facing challenges due to the expanding urban areas, changes in farming practices by farmers, and the rising demands of a growing population. The consequences of these alterations in land utilization extend beyond a single region. They impact the movement of water, the diversity of flora and fauna, the amount of carbon stored, and the region's ability to withstand environmental influences. The objective of this study is to gain insights into the temporal changes occurring in the basin's landscape through the utilization of geospatial techniques. The researcher will provide an in-depth analysis on the utilization of land in the Ghod River Basin, culminating in a comprehensive report. This assessment will encompass previous modifications,

the motives behind them, and potential results for both the environment and individuals residing in communities. The results of this research will enhance our comprehension of the intricate relationship between land usage and the environment. Additionally, individuals responsible for determining and organizing the sustainable utilization of land will find this information valuable.

The study area:

The study site is situated at a latitude range of 18°30` to 18°45`N and a longitude of 74°15`. The place is situated at a longitude of 75 degrees and 00 minutes to the east. The elevation of the area ranges from 494 to 634 meters, and it is situated within the Deccan Plateau. Maharashtra is situated in the western region of India. Convert this piece of writing into simpler terms: kilometer. The research area comprises of Shrigonda and Karjat talukas. Jamkhed is located towards the eastern side, Parner is situated towards the northern side, Daund is positioned towards the southern side, and Khed is located towards the eastern side of Shirur taluka. For the purpose of this study, specific regions within the Pune district have been selected. The mentioned regions encompass 65,464 hectares in the Shrigonda area, 34,907 hectares in the Karjat area, and 49,089 hectares in the Shirur area, specifically under the Ghod right canal.



Objective

- To study irrigation in the benefit area of Ghod Dam
- To study the changing water use of Ghod Dam
- To study Seasonal evaporation of Ghod dam.

Data Collection and Methodology:-

The analysis utilized existing data. So, here is a spatial examination for the year 2011 at the tehsil level. For the purpose of this study, secondary data was gathered through the use of document summaries published by the census of India in the districts of Ahmednagar and Pune. The data and information that was gathered were examined by creating analysis.

Result Discussion:

While transporting the water from the dam to agriculture in Srigonda Karjat and Shirur talukas through suction irrigation and canal irrigation, the efficiency of canal irrigation is 95%, the area efficiency is 65% and the average efficiency is 45.5%. Ursa irrigation has a water transport efficiency of 70% with an area efficiency of 65% and an average efficiency of 61.75%.

This means that the efficiency of suction irrigation is higher than that of canal irrigation. Because there is no lining of the canal, water leaks

during canal transportation. As a result 30% of water is wasted up to the final area of the canal.

Seasonal evaporation of Ghod dams:

Evaporation is the evaporation of water. Temperature, wind and water surface affect evaporation. During the period 2007-08 to 2021-22, the highest evapotranspiration of Ghod Dam was 45.60 million cubic meters in 2010-11 and 45.07 million cubic meters in 2018-19. This evaporation is 1.56 TMC and 12.42 % of the total water storage is evapotranspiration. Evaporation rate is higher in rabbi and summer season as compared to kharif season. Because the dam is not filled to its full capacity during the Kharif season, the water surface is low. As a result the rate of evaporation is less. whereas the temperature is higher during Rabbi season. Also, since the dam is full, the water surface is more, resulting in more evaporation. In summer season, if the water storage in the dam is high, the rate of evaporation is high. Due to this evaporation, the water storage in the dam cannot be fully utilized.

Area irrigated before 1985				
	Type of Crops	Right Canal	Left Canal	Total
1	Kharif	2833	7284	10117
2	Rabbi	2023	4856	6869
3	Annual	2267	5990	8267
4	Total	7123	18130	25263

Area irrigated After 1985					
	Type of Crops	Right Canal	Left Canal	Total	Water need in TMC
1	Kharif	2540	5860	8400	3.7
2	Rabbi	2740	6260	9000	4.08
3	Annual	1010	2090	3100	2.0
4	Total	6290	14210	20500	9.87

Irrigation:

The total area of 103 villages in Srigonda, Karjat, and Shirur talukas in Ghod Dharan Labh area is 149460 hectares. Out of this uncultivable area is 15.98%, fallow area is 4.43% and net sown area is 75.78%. Of the net sown area, 48.56% is

irrigated and 51.45% is cultivated area. 18.44% of the net sown area is canal irrigated, 21.21% well irrigated and 11.80% river irrigated. The area up to 200 meters from the canal is considered canal irrigated. Also, the area used for agriculture by

pumping water from the wells near the canal is also

considered as canal irrigation.

Taluka wise irrigated area after 1985				
Sr.no	Taluka	Total Benefit Area	Cultivable Area	Irrigated Area
१	Shrigonda	28064	14000	9070
२	Karjat	13096	9500	5240
३	Shirur	11208	10160	6190
४	Total	52368	33660	20500

Canal Irrigation:

Ghod Dam has two canals and the left canal goes to Srigonda and Karjat talukas while the right canal has increased irrigation in Shirur taluka. As the slope of the study area is south and south-east direction, canal water is used to a lesser extent by the agricultural area in north-east and north direction. Masalwadi 80.14 %, Shedgaon 81.40 %, Hangewadi 75.30 %, Dhokra 68.3 %, Wangdari 64.71 %, Domlewadi 62.50 %, Madhewadgaon 58.04 %, Gar 55.76 %, Mundekarwadi 55.56 %, Vadgaon Rasai 54.62 %, Chikhalthan Wadi 53.10 %, Pimpri Kolandar 52.17 %, etc. villages have more canal irrigated area. Some villages in the study area are not directly dependent on dams or canals. But the canal water has increased the underground water level and increased the horticultural area.

Well Irrigation

Well irrigation is of utmost importance in agricultural development and India is the first country in the world to use ground water. Drinking water system in rural areas is dependent on groundwater. Well irrigation is the only option in regions where canals and rivers are not available. In the study area Ajnuj 81.48 %, Ganegaon Dumala 68.20 %, Kauthe 66.13 %, Kashti 65.13 %, Yesewadi 57.98 %, Tandli 57.52 %, Chormalewadi 55.86 %, Remu 50.41 %, Mandavgan Farata 50.02 %, Dhupalwadi 46.20 %, Anandwadi 43.75 %, Vaisewadi 42.86 %, Mhatar Pimpri 41.15 %, Sangvi Dumala 40.30 % etc. Well watered area is more in the village and Masalwadi, Karbanwadi, Chavanwadi, Nimone, Karde, Kaindi, Babhulsar, Pimpalwadi, Karegaon, Golegaon, Rakshaswadi Budruk, Kuldharan, Policewadi, Amble, Angare, Kansewadi, Kuruli, Nirvi, Math, Vadgaon Shindodi, Bardgaon, Siddhatek, Rakshaswadi, Mhse, Sonalwadi, Kolgaon Dolas, Hingangaon, Chimble, Shedgaon, Sadalgaon etc. The well irrigated area in the village is less than 10%.

River Irrigation

Bhima river, Ghod river, Hanga river and Saraswati river flow. The agricultural area in the villages of Bori, Hangewadi, Pimpalsutty, Inamgaon, Kashti, Tandli, which are located between the left canal of the dam and the Ghod river, can use the water of the canal and the Ghod river. Also, the farmers of the villages of Vadgaon Rasai, Fardwadi, Sadalgaon, Mandavagan Farata, Ganegaon, Tandli, Babulsar, Sangvi Dumala, which

are located between Ghod Ujwa Canal and Bhima River, depend on the water of Ghod Ujwa Canal and Bhima River, so the irrigated area in these villages is more.

Lake:

Apart from dams, rivers, wells and canals, percolation ponds play an important role in irrigation in the study area. Percolation ponds are required to raise the groundwater level. This lake is created by creating an earthen dam on the stream or drain. Except the perennial horticultural areas of the canal and Ghod river in the study area, these ponds are more abundant in other regions. Karjat taluka and Uttar Shirur taluka have more seepage lakes in the study area.

Conclusion

Due to disparity in the carrying capacity of the right and left canals of Ghod Dam, the villages under the left canal passing through Srigonda and Karjat taluks benefit more from the dam. As the slope of the area irrigated by the left canal in the study area is towards south and south-east direction, in this region canal feeding and siphon method provides maximum water supply to the farmers at low cost as electricity is not required for this irrigation. Farmers on the north side of the canal have to pump irrigation from the canal with the help of electric pumps, thus limiting irrigation. Also, the water level of wells at long distance in this region takes more time to rise. Math, Rajapur, Hingani Dumala, Vadgaon Shindodi, Chinchani, Gunat, Nimone, Motewadi, Danewadi, Chavanwadi, Bhashe, Yelpana etc. the topography of the village is high hills, when the water level in the dam decreases, the distance for irrigation increases. Therefore, the amount of irrigation in this village is less compared to plains. Evaporation rate in Ghod Dam is high due to hot weather in the study area and it increases after March if water storage in the dam is high. Up to 1.56 TMC of water in Ghod Dam is evaporated. Ghod Dam was constructed with two canals in 1965, but these canals were not lined, resulting in waste of water during circulation. Also, the main canals have many dams and the water seeps into the ground, increasing the water in wells and fountains near the canal.

Reference:

1. Rao, V.M., 1979, Farming with Irrigation and Irrigated farming: A comparative study in

- impact of Irrigation by Tank, Well, Canal, Himalaya pub. Co., Bombay.
2. Reddy, N.B.(1984):Ground water Resources in Swarnmukhi Basin. The Geographical Journal, Vol.59, No.2
 3. Saptarshi P.G. (1971): "Geographical Account of Pauna Basin, District, Pune, Maharashtra", dissertation submitted for M.Sc. Degree in Geography to the University of Pune.
 4. Saptarshi P.G. (1987): 'Social forestry and Dairy Forming" Mahar~shtra Bhugolshastra sanshodhan Patrika" Maharashtra Bhugolshastra Panshad, Pune Vol 1 No.1 Pp. 27-37.
 5. Shivendra Kumar Srivastava-Irrigation Development and Groundwater Extraction in Uttar Pradesh state: Emerging Issues of Distribution and Sustainability -2007
 6. Vasudeva, Rao, D., 1975, Economic use of water for irrigation – The southern Economist, 14 (3).