Contribution of Rajshree Shahu Maharaj in Irrigation Sector and Present Status of Irrigation in Kolhapur District

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Introduction

By the first quarter of the 19th century, the British had brought a large part of India under their rule. For the first few decades, he devoted himself to subduing rebellious pockets of resistance and introduced various social and economic reforms. They also constructed temporary tanks and barrages on rivers and streams. Some of the irrigation works built by the British in Maharashtra are still in use, for example the Krishna canal in Satara district, Shahada canal in Dhule district, Lakh canal in Ahmednagar district, Jamda canal in Jalgaon district, Khadakwasla canal near Pune city etc. But the system was purely Government administered and had no place for local participation.

After a nationwide rebellion in 1857, the Crown Government of England took over the administration of the country from the Government of the East India Company in 1860. The Crown Government continued the reforms of its predecessors with the same zeal. By 1867, the government had commissioned the East India Irrigation Company and the Madras Irrigation Company to complete various irrigation works on the promise of at least 5% return on capital investment. But these companies failed to honour their commitments and the government had to take back half-completed works from them.

In 1883, the then social reformer Jotirao Phule presented a charter of demands of the local farmers to the Government. It suggested implementation of soil and water conservation, land embankment and leveling to prevent soil erosion and supply water for irrigation, so as to improve the condition of farmers.

Throughout history, irrigation development has been linked to the political and social conditions of a country. British era was no exception. The modern history of irrigation in India begins in the second half of the 19th century. Regarding the protection of crops by irrigation during droughts, the Central Irrigation Commission (1901-03) observed that "Unlike the drought in 1877-78, it is no more necessary to increase the lands under crops in the Deccan during the drought years, because of the increased facilities to transport foodgrains to the drought-affected areas. But it has now become necessary to provide to the farmers some agricultural related work during the drought period. If irrigation provides such work to them, then it is irrelevant whether they grow foodgrain crops or cotton or sugarcane".

Contribution of Rajshree Shahu Maharaj in Irrigation Sector

Weir is a low dam that is built across a river to raise the water or control its flow. In most of districts of Maharashtra Kolhapur type weirs have been constructed on a large scale as a means of small irrigation the Kolhapur type weirs is constructed by using stone masonry and cement . It is not an integrated structure the silt is carried downstream whit the first heavy rains alike vanarai weirs during the last phase of monsoon that is around September-October steel the slots this makes the weir an integrated structure and rainwater form the tail end of the monsoon begins accumulating behind it with judicious use the water is expected to last throughout the summer when the next monsoon arrives the flats are removed and reinserted by its tail end the cycle goes on year after year with the scrupulous adherence to this cycle Kolhapur type weirs prove to be an effective means of water conservation and irrigation. Chh. Shahu Maharaj the rule of the erstwhile princely state of Kolhapur type for the first time innovated such type of weirs in Radharanagari tehsil of his state during the period 1907 to 1918 later on his son

Chh. Rajaram Maharaj constructed such a structure at Kasbah bavda near Kolhapur type city .These original weirs are deemed to be the predecessors of today's Kolhapur type weirs all over Maharashtra and are being constructed in a large number particularly in the drought prone areas of the state these weirs erasure permanent availability of water to the standing crops raise the levels of well water thereby enhancing the area of irritated land which in turn enhances agricultural income and also ensures availability of water for domestic and cattle's use ensures availability of water for domestic and cattle's use.

Concept and Information of Irrigation System

A dam is a barrier across the horizontal width of a river that changes the characteristics of the water flow and usually changes the elevation of the river level. There are many designs of weirs, but typically the water flows freely over the top of the weir crest before descending. Weirs are commonly used to prevent flooding, measure discharge, and help make rivers more navigable by boats. In some places, the terms dam and weir are synonymous, but generally a clear distinction is made between the structures. A dam is usually designed specifically to hold back water behind a wall, while a dam is designed to change the flow characteristics of a river. The state government's water management policy has recommended strict monitoring of 32,000 Kolhapur type weirs to optimize water storage in dams used for kharif and Rabi crops in the district of Maharashtra. In the wake of the government's plan to make 28,000 villages out of 40,000 villages in the state drought-free, it has been decided to explore different methods for water storage and management.

Kolhapur type weirs, which were built in large numbers, have been in a state of total neglect for 15 years. There has never been an initiative to make investments for its maintenance. The Kolhapur type weirs are critical for water storage in dams, which could be utilized during the dry spell in summers to fight drought, said an official in the water resources department.

The Kolhapur type weirs (K.T Weirs) and bridge-cum-barrages built across dams and rivers are used to regulate the water flow and storage, which is significant for tackling drought. The decision to explore various methods to optimize water storage and management comes in the backdrop of the government's plan to make 28,000 of the state's 40,000 villages drought-free in almost 70 per cent Kolhapur type weirs, the gates are either missing or badly maintained. As a result, it does not serve the purpose of water storage, said a source. These projects are not monitored due to lack of manpower. An audit report also shows that successive governments for the last 15 years have never paid much attention on determining the time-table of opening and closing of the Kolhapur type weir gates, thus, defeating the objective for which it was constructed. The Kolhapur type weir model of water storage and management, which is a success story if maintained properly, is being studied by several other states.

Significance of The Study

The present study will enable us to acquaint with a profile of the study area Kolhapur type weirs tank. The study will help in knowing economic analysis of Kolhapur type weirs tank and their impact on agricultural development. This study will come out with suggestion useful to control negative and positive impact of Kolhapur type weirs on agricultural development. The study will be helpful in formulating agricultural policy relating to the Kolhapur type weirs. The study will play important role in providing knowledge and creating awareness among the people and society about the adverse economic analysis of Kolhapur Type weirs tank and their impact on agricultural development.

Objectives of The Study

1. To study the Concept and Information ofIrrigation System established by Rajshree Shahu Maharaj.

2. To study the Irrigation Status in Kolhapur District.
3. An analysis of Irrigated Agriculture area in Kolhapur District.
4. To suggest measures for improvement if necessary.

Research Methogology

Only secondary data has been collected from Books, Journals, Gazetteer, Agricultural epitomes, RBI Report, Irrigation reports published by the department of irrigation (2011 to 2020).

Limitation of The Study

The major limitation of this research is that the present research is related to only irrigation status in Kolhapur district during the period 2011 to 2020 and conclusion of this research may not be applicable to other area.

Data Analysis and Interpretation

Table No. 1: Irrigation Status in Kolhapur District

(Area hectare)

Sr. No	Year	Well	Borewell	Small Irrigation Dam	Medium Irrigation Project	Large Irrigation Project
1	2011	79566	144	31798	90994	277210
2	2012	79566	74	40677	79886	122949
3	2013	79566	82	35423	95946	134444
4	2014	79566	170	35357	95946	134444
5	2015	79566	112	51312	68942	122769
6	2016	31316	116	51312	70677	122769
7	2017	33669	108	29609	70677	132686
8	2018	28939	83	31925	75133	133314
9	2019	74984	85	31925	75133	133314
10	2020	60703	80	31925	75133	133314
Total		**627441**	**1054**	**371263**	**798467**	**1447213**
Average		**62744.1**	**105.4**	**37126.3**	**79846.7**	**144721**
SD		**22471.55**	**31.49**	**8077.19**	**10521.80**	**46830.15**
CV		**35.81**	**29.87**	**21.76**	**13.18**	**32.36**
CAGR		**-0.03**	**-0.06**	**0.0004**	**-0.02**	**-0.08**
Max.		**79566**	**170**	**51312**	**95946**	**277210**
Min.		**28939**	**74**	**29609**	**68942**	**122769**

Source: Socio Economic Survey of Kolhapur 2011 to 2020

In this table no. 1 indicate that the irrigation status in Kolhapur district during the period of 2011 to 2020.

1. The average of well irrigated area during the period 2011 to 2020 was 62744.1 hectare respectively. The compound annual growth rate of area under well irrigated was -0.03 percent respectively. The coefficient of variance of area under well irrigated was 35.81 percent respectively. The maximum area under well irrigated has been observed as 79566 hectare respectively. Likewise the minimum area under well irrigated were 28939 hectare respectively during the study period. Hence in short it can be stated that the area under well irrigated is decreasing trend.
2. The average of borewell irrigated area during the period 2011 to 2020 was 105.4 hectare respectively. The compound annual growth rate of area under borewell irrigated was -0.06 percent respectively. The coefficient of variance of area under borewell irrigated was 29.87 percent respectively. The maximum area under borewell irrigated has been observed as 170 hectare respectively. Likewise the minimum area under borewell

irrigated were 74 hectare respectively during the study period. Hence in short it can be stated that the area under borewell irrigated is decreasing trend.

3. The average of small irrigation dam irrigated area during the period 2011 to 2020 was 37126.3 hectare respectively. The compound annual growth rate of area under small irrigation dam irrigated was 0.0004 percent respectively. The coefficient of variance of area under small irrigation dam irrigated was 21.76 percent respectively. The maximum area under small irrigation dam irrigated has been observed as 51312 hectare respectively. Likewise the minimum area under small irrigation dam irrigated were 29609 hectare respectively during the study period. Hence in short it can be stated that the area under small irrigation dam irrigated is fluctuating trend.

4. The average of medium irrigation project irrigated area during the period 2011 to 2020 was 79846.7 hectare respectively. The compound annual growth rate of area under medium irrigation project irrigated was -0.02 percent respectively. The coefficient of variance of area under medium irrigation project irrigated was 13.18 percent respectively. The maximum area under medium irrigation project irrigated has been observed as 95946 hectare respectively. Likewise the minimum area under medium irrigation project irrigated were 68942 hectare respectively during the study period. Hence in short it can be stated that the area under medium irrigation project irrigated is decreasing trend.

5. The average of large irrigation project irrigated area during the period 2011 to 2020 was 144721 hectare respectively. The compound annual growth rate of area under large irrigation project irrigated was -0.08 percent respectively. The coefficient of variance of area under large irrigation project irrigated was 32.36 percent respectively. The maximum area under large irrigation project irrigated has been observed as 277210 hectare respectively. Likewise the minimum area under large irrigation project irrigated were 122769 hectare respectively during the study period. Hence in short it can be stated that the area under large irrigation project irrigated is decreasing trend.

Table No. 2 : Status of Agriculture Irrigated area in Kolhapur District

(Area in hectare)

Sr. No	Year	Net Area Under Irrigation	Gross Area Under Irrigation	Gross Area Under Total Cultivation
1	2011	128584	135151	567976
2	2012	128584	135151	567976
3	2013	128584	135151	567976
4	2014	128584	135151	567976
5	2015	128584	135151	567976
6	2016	171363	181351	456679
7	2017	170718	186803	470042
8	2018	159357	189580	452501
9	2019	156511	180251	447102
10	2020	186238	202020	447852
Total		1487107	1615760	5114056
Average		148711	161576	511406
SD		22620.92	28455.72	59954.39
CV		15.21	17.61	11.72
CAGR		0.04	0.05	-0.03
Max.		186238	202020	567976
Min.		128584	135151	447102

Source: Socio Economic Survey of Kolhapur 2011 to 2020

In this table no. 2 indicate that the status of agriculture irrigated area in Kolhapur district during the period 2011 to 2020.

1. The average of net area under irrigation in Kolhapur district during the period 2011 to 2020 was 148711 hectare respectively. The compound annual growth rate of net area under irrigation was 0.04 percent respectively. The coefficient of variance of net area under irrigation was 15.21 percent respectively. The maximum net area under irrigation has been observed as 186238 hectare respectively. Likewise the minimum net area under irrigation was 128584 hectare respectively during the study period. Hence in short it can be stated that the net area under irrigation is increasing trend.
2. The average of gross area under irrigation in Kolhapur district during the period 2011 to 2020 was 161576 hectare respectively. The compound annual growth rate of gross area under irrigation was 0.05 percent respectively. The coefficient of variance of gross area under irrigation was 17.61 percent respectively. The maximum gross area under irrigation has been observed as 202020 hectare respectively. Likewise the minimum gross area under irrigation was 135151 hectare respectively during the study period. Hence in short it can be stated that the gross area under irrigation is increasing trend.
3. The average of gross area under total cultivation in Kolhapur district during the period 2011 to 2020 was 511406 hectare respectively. The compound annual growth rate of gross area under total cultivation was -0.03 percent respectively. The coefficient of variance of gross area under total cultivation was 11.72 percent respectively. The maximum gross area under total cultivation has been observed as 567976 hectare respectively. Likewise the minimum gross area under total cultivation was 447107 hectare respectively during the study period. Hence in short it can be stated that the gross area under total cultivation is decreasing trend.

Conclusions

1. The average of well irrigated area during the period 2011 to 2020 was 62744.1 hectare respectively. The compound annual growth rate of area under well irrigated was -0.03 percent respectively. Hence in short it can be stated that the area under well irrigated is decreasing trend.
2. The average of borewell irrigated area during the period 2011 to 2020 was 105.4 hectare respectively. The compound annual growth rate of area under borewell irrigated was -0.06 percent respectively. Hence in short it can be stated that the area under borewell irrigated is decreasing trend.
3. The average of small irrigation dam irrigated area during the period 2011 to 2020 was 37126.3 hectare respectively. The coefficient of variance of area under small irrigation dam irrigated was 21.76 percent respectively. Hence in short it can be stated that the area under small irrigation dam irrigated is fluctuating trend.
4. The average of medium irrigation project irrigated area during the period 2011 to 2020 was 79846.7 hectare respectively. The compound annual growth rate of area under medium irrigation project irrigated was -0.02 percent respectively. Hence in short it can be stated that the area under medium irrigation project irrigated is decreasing trend.
5. The average of large irrigation project irrigated area during the period 2011 to 2020 was 144721 hectare respectively. The coefficient of variance of area under large irrigation project irrigated was 32.36 percent respectively. Hence in short it can be stated that the area under large irrigation project irrigated is decreasing trend.
6. The average of net area under irrigation in Kolhapur district during the period 2011 to 2020 was 148711 hectare respectively. The coefficient of variance of net area under irrigation was 15.21 percent respectively. Hence in short it can be stated that the net area under irrigation is increasing trend.

7. The average of gross area under irrigation in Kolhapur district during the period 2011 to 2020 was 161576 hectare respectively. The compound annual growth rate of gross area under irrigation was 0.05 percent respectively. Hence in short it can be stated that the gross area under irrigation is increasing trend.
8. The average of gross area under total cultivation in Kolhapur district during the period 2011 to 2020 was 511406 hectare respectively. The compound annual growth rate of gross area under total cultivation was -0.03 percent respectively. Hence in short it can be stated that the gross area under total cultivation is decreasing trend.

Suggestions:

1. The Irrigation development for agriculture should be made available easily, timely and at the affordable cost to the farmers especially during the harvesting period.
2. The agricultural cost of production is seeming more compare with state and national level figures in study region, hence it has been suggested that farmers should promotes to use cost effective irrigation techniques.
3. Suggested that the individual Supply Management Strategy work out a feasible and assured water delivery oriented management strategy.

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