



**ORIGINAL RESEARCH PAPER**

**Commerce**

**A STUDY OF DAM IRRIGATION IN MAHARASHTRA: SPECIAL REFERENCE TO ISAPUR DAM**

**KEY WORDS:** Erratic, Salinization, Catchment area.

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**ABSTRACT**

Agriculture is the single most important contributor of Indian economy. Agriculture contributes about sixteen percent (16%) of total GDP and ten (10%) of total exports India secured 2nd position worldwide in terms of farm output & second largest country in terms of total arable land over 60 % of India's land area is arable. The geographical area of the state is 30.7 Mha. & Cultivable area is 22.5 Mha. (73% GA). Out of this 40% area is drought prone. About 7% areas is flood prone. The highly variable rainfall in Maharashtra ranging from 400 to 6000 mm occurs in 4 months period 100 days. The agriculture suffers due to vagaries of monsoon. Nearly 148 Talukas are drought prone. There are 5 major river basis in the state i.e. Krishna, Godavari, Tapi & Narmada. West flowing rivers in Kokan Region. annual availability of water resources in the state constant of 164 km<sup>3</sup> of surface water & 20.5 km<sup>3</sup> of subsurface water.

**Summary:**

Water is part & parcel for the growth of agriculture and irrigation provides supply of water to agriculture. In recent period due to irrigation India has become self-sufficient in respect of food supply to such a huge size of population of our country and India has also become dominant exporter of food grain because nearly 70% of Indian export originated from agriculture sector.

Maharashtra is the state with the maximum number of dams. According to the National Register of Large Dams, Maharashtra has 1845 dams it is around 35percent of India's large dam. Madhya Pradesh comes next with 906 dams. Maharashtra is also ahead of every other state with regards to projects under construction. Currently, it has 152 projects underway various major, medium & minor irrigation projects have been taken by the state government to create maximum possible irrigation in the state. Some large dams which provide Irrigation in Maharashtra are Koyna Dam, Jayakwadi Dam, Totladoh Dam, Ujini Dam, Issapur Dam, Jayakwadi dam are largest dam in Marathwada & Vidharbha Region.

Only 18 percent is irrigated. If compared that, Punjab is 98 percent irrigated, Haryana is 90 % UP is 60, Bihar is 60-70 %. The national average of land that is irrigated is between 45-56 %. We're at 18 percent. Kerala is lower than us. 18 % is just bad.

Isapur dam is one of the major dams in Maharashtra it is in Yavatmal district the Painganga river is the chief river of the Yavatmal district in the Maharashtra state in India.

The projects will be socio economically beneficial to the command area the primary data are clearly including, that the Isapur dam has played vital role in the development of agricultural area and ultimately it was an inspiration in financial betterment of the farmers because of this the socio economic condition of the respondents changed remarkably leading improved standard of living of respondents. So the first hypothesis i.e. the project will be socio economically beneficial to the command area is accepted.

**Introduction**

Agriculture is the single most important contributor of Indian economy. Agriculture contributes about 16% of total GDP and 10% of total exports India secured 2<sup>nd</sup> position worldwide in terms of farm output & second largest country in terms of total arable land over 60 % of India's land area is arable.

**Importance of agriculture**

Water is part & parcel for the growth of agriculture and irrigation provides supply of water to agriculture. In recent period due to irrigation India has become self-sufficient in respect of food supply to such a huge size of population of our country and India has also become dominant exporter of food grain because nearly 70% of Indian export originated from agriculture sector.

**Importance of irrigation in Indian Agriculture**

Indian economy is based on agriculture & agriculture is totally depend on water it may be from natural source i.e. rain fall or artificial source i.e. irrigation, monsoon rain fall in India comes in monsoon & monsoon is irregular and erratic in nature. Without irrigation agriculture is not possible. Indian land is fertile plain land suitable for Rabi as well kharif crops. But during winter months there is a no rainfall. So farmers have to depend on irrigation to production of Rabi crops along with other crops.

According to agricultural census 2010-11, India's total area under irrigation is 64.7 million hectares. 17005.7 are canals, 2249.48 are tanks, 29108.2 are tube wells, 4289.29 are other sources of Irrigation.

**Dam Irrigation in Maharashtra:**

The geographical area of the state is 30.7 Mha. & Cultivable area is 22.5 Mha. (73% GA). Out of this 40% area is drought prone. About 7% areas is flood prone. The highly variable rainfall in Maharashtra ranging from 400 to 6000 mm occurs in 4 months period 100 days. The geographical area of Maharashtra has been divided into 36 Districts & 358 Talukas for administrative purpose. The agriculture suffers due to vagaries of monsoon. Nearly 148 Talukas are drought prone. There are 5 major river basis in the state i.e. Krishna, Godavari, Tapi & Narmada. West flowing rivers in Kokan Region. annual availability of water resources in the state constant of 164 km<sup>3</sup> of surface water & 20.5 km<sup>3</sup> of subsurface water. An Irrigation potential of 48.25 lakh hectares has been created through an investment of Rs. 71000 crore.

Maharashtra is the state with the maximum number of dams. According to the National Register of Large Dams, Maharashtra has 1845 dams it is around 35percent of India's large dam. Maharashtra is also ahead of every other state with regards to projects under construction. Currently, it has 152 projects underway various major, medium & minor irrigation projects have been taken by the state government to create maximum possible irrigation in the state.

**Objective of the study:**

- 1) To study the dam irrigation in Maharashtra.
- 2) To ascertain the strengths & opportunities of the Isapur project.

**Hypothesis of the study:**

- 1) The project will be socio-economically beneficial to the command area.

**Limitations of the study:**

- 1) This research work will be limited to the given objectives by the researcher.

**Research Methodology:**

- **Sample size:** sample size of 300 farmers was taken for the

purpose which was collected from 3 districts of Maharashtra & vidarbha region. Effort was made to select the respondents from each district i.e. 10% of total villages in each district and from each selected villages 10 farmers were selected i.e. from Yavatmal 50, Hingoli 70, and Nanded 180.

- **Method of sampling:** purposive sampling was used in the research.
- **Sample Unit:** Farmers in Marathwada & Vidharbha region including 3 districts i.e. Yawatmal, Hingoli & Nanded.
- **Selection of the study area:** Study area is isapur dam and this dam provides irrigation to three districts mainly Yawatmal, Hingoli & Nanded.
- **Data collection:**
- **Primary Data:** Primary data was collected from the sample respondents by using interview & filling pretested questionnaires.
- **Secondary Data:** The secondary data has been collected gathered from the concerned Government officers of Nanded and Walmi Aurangabad, Gokhale Institute Pune, Agricultural University Parbhani, Books, Research Papers, Research Journals, Published Data & Websites etc.

**Review of Literature:**

**Sangle S.T. (1996)** has studied an impact of irrigation in jaikwadi command area, using the multistage stratified random sampling. The study indicated that the cropping pattern in command area was in favor of commercial crops and high water consumption crops as compared to un-commanded area. Further this study indicated that the degree of diversifiable was more in command area in compared to un-commanded area and irrigation has enhanced the average per hector productivity of almost all crops in command area.

**Shekhawat M.S. and Singh K.K. (1997)** they have evaluated in their article on "Better Management of Water" that in India just 25% rain water is utilized for irrigation. The total irrigation efficiency in the canal command area is very low and there is a vast gap between the potential created and exploited. The loss of water is not only wastage of water resource created at huge cost but it results in the two problems of water logging and soil salinization

**Shivannappan, R.K.(2005)** he has studied in his article on "Ensuring water for all" that water has emerged as the most crucial factor for sustaining the agricultural Sector in the coming years. India accounts for sixteen percent of the world's human population and nearly thirty percent of the cattle with only 2.4 percent of the land area and 4 percent of water resources.

**Koli P.A. and Bondhale A.C. (2006)** The writer have suggested in their book on 'Irrigation Development in India' that due to a lack of irrigation facilities successful cultivation is not possible in large part of our country; In the absence of irrigation facilities, there are large areas in our country which often produce one crop.

**Kurulkar R.P. (2009)** has studied the "Problems of regional disparities in Maharashtra state with special reference to the fact finding committee report (1984) and the indicators and backlog committee report (1997). He concluded that the problem of regional disparities exists at the state level, national and international. Between 19984 and 1994,. The data show that the regional disparities.

**Sachidanand Mukharji (2016)** in his article "Role of water resources management in economic development" he has remarked that the water level is dangerously decreasing in India. Rice, sugar cane and other crops requiring huge water for cultivated during the year. Uncertainty in water supply to barrages, less investment in ground water irrigation facility.

**Profile of Isapur Dam**

Isapur dam is one of the major dams in Maharashtra it is in

Yavatmal district the Painganga river is the chief river of the Yavatmal district in the Maharashtra state in India. This river originates in the Ajanta ranges in Aurangabad district in Maharashtra. This dam is on the Painganga River at isapur, Pusad Tq. Yavatmal Dist., this dam provides irrigation to three districts which are Hingoli, Nanded and Yavatmal of Maharashtra. There are two projects on the river namely upper Painganga and lower Painganga project. Upper Painganga project consist two dams these are Isapur dam and sapli dam.

Godawari Marathwada Irrigation Development Corpotation Aurangabad started construction of upper Painganga project in 1971. The construction of Isapur dam is over on construction of Sapali dam is under construction. The construction work left canal of Isapur dam has completed and out of 15937 hectors Irrigation, 14062 hectors Irrigation sector has created at the end of june 2009, and their work is in process. In the same way, the construction of right canal of dam has completed up to 115 km, construction between 116 to 140 km. is in process. At the end of june 2009 out of 91153 hectors irrigation 71490 hectors irrigation sectors has created by right canal of Isapur dam.

According to fifth revised estimate of upper Painganga Project by Godavari Marathwada irrigation Development Corporation Aurangabad. The estimate cost of upper Painganga is 355028 lakh.

**Features of Isapur dam**

- Dam provides Irrigation to three Districts Hingoli, Yavatmal and Nanded.
  - Total catchment area of Isapur dam is 4636 Sq. Km.
  - Gross command area of Isapur dam is 19675 hectors.
  - Net irrigable command area is 15937.
  - Cultivable command area is 17708.
  - B.C. Ratio is 1.62
  - Cost of water storage including Bandharas on Painganga river per M.cum is Rs. 400649.
- a) Villages under submergence are 29 water storage of Isapur dam Gross storage 1279.06 mcum Live storage 964.10 mcum Deal storage 314.97 mcum

**Data Analysis and interpolation:**

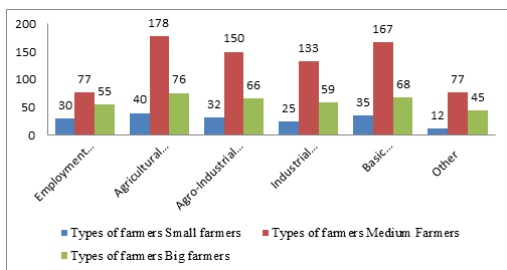
**Table No.1.1 Opportunities arise by Isapur dam**

Sr. No.	Particulars	Types of farmers			Total
		Small farmers	Medium Farmers	Big farmers	
1	Employment generation	30	77	55	162
2	Agricultural development	40	178	76	294
3	Agro-Industrial development	32	150	66	248
4	Industrial development	25	133	59	217
5	Basic Infrastructure development	35	167	68	270
6	Other	12	77	45	134
7	<b>Total</b>	<b>174</b>	<b>255</b>	<b>131</b>	<b>560</b>

(Source: Primary data)

The above table shows the opportunities arises due to Isapur dam in a command area. From this table it is indicated that various opportunities like Employment generation, agricultural development, agro industrial development, basic infrastructure has been developed in the command area of Isapur dam. As a result of this socio economic conditions of the farmers has been developed.

Graph No.1.1. Opportunities arise by Isapur dam



**Hypothesis Testing**

**H1- The project will be socio economically beneficial to the command area.**

The researcher has used benefit cost ratio for testing this hypothesis

**Benefit cost ratio:-**

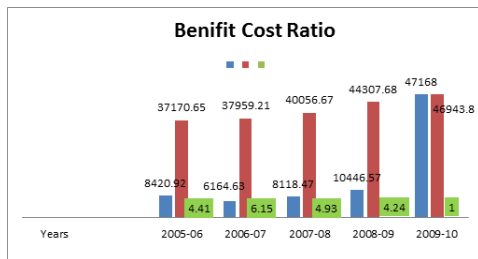
A benefit cost ratio (BCR) attempt to identify the relationship between the cost and benefits of a proposed project. A benefit – cost ratio (BCR) is an indicator, used in cost benefit analysis that attempts to summarize the overall value of money of a project.

$$\text{Benefit cost formula} = \frac{\text{The total value of the benefits}}{\text{The total value of the costs}}$$

Table No. 1.2. Benefit cost ratio

Years	Annual Expenditure	Annual Benefits in Lakh	Calculation of B.C. Ratio	B.C. Ratio
2005-06	8420.92	37170.65	4.41	4.41:1
2006-07	6164.63	37959.21	6.15	6.15:1
2007-08	8118.47	40056.67	4.93	4.93:1
2008-09	10446.57	44307.68	4.24	4.24:1
2009-10	47168	46943.80	1	1:1

(Source: Upper Painganga Project, Division Nanded)



The graph is showing BCR of Isapur dam for five years and this is more than 1 it indicates benefits are more cost of this project it includes profitability of this project for command area. So the first hypothesis i.e. the projects will be socio economically beneficial to the command area is accepted.

The projects will be socio economically beneficial to the command area. The Isapur dam has played vital role in the development of agricultural area and ultimately it was an inspiration in financial betterment of the farmers because of this the socio economic condition of the respondents changed remarkably. They leading improved their standard of living. So the first hypothesis i.e. the project will be socio economically beneficial to the command area is accepted.

**Findings:-**

- 1) The Isapur dam provides irrigation benefits mainly to three districts i.e. Yavatmal, Hingoli & Nanded.
- 2) The lands in study area are fertile and capable for growing variety of crops.
- 3) After completion of construction work, the Isapur dam providing irrigation through canals to 164 villages of Nanded districts, 70 Villages of Hingoli districts and 49 Villages of Yavatmal districts.
- 4) Total catchment area of Isapur dam is 4636 Sq. Km, Gross

command area is 19675 hectares and net irrigable command area is 15937 hectares.

- 5) Farmers are not having access to information about Isapur dam canal water. The information about storage of water, opening and closing dates of canal rotation and quantum of water flow are not available to the farmers.
- 6) It is observed that in some command area farmers totally depends on Isapur dam water for irrigation purpose and maximum farmers are using canal along with Well, Tube Well and other sources. Out of 300 beneficiaries 139 (including small, medium and big farmers) are using canal water for their farm and 76 beneficiaries use Bore well and 73 beneficiaries use well. The level of ground water is totally depends upon canal water. So indirectly beneficiaries of well and bore well depend upon canal water of this dam.
- 7) This dam's canal irrigation has increased and created the employment opportunity to the farm labors in command area.
- 8) Due to irrigation facility the farmers have become happy and their attitude is turned towards the farming of horticulture and floriculture.
- 9) In some command area farmers are using flow irrigation method. Drip irrigation and sprinkler irrigation methods. 37% beneficiaries are using drip irrigation, 23% beneficiaries are using sprinklers irrigation and 30.66% are using surface irrigation.
- 10) It is clearly indicate, that the Isapur dams canal irrigation has played vital role in the development of agricultural area and ultimately it was an inspiration in financial betterment of the farmers & their socio economic conditions has been improved.

**Conclusion:**

While analyzing the data researcher found important factors, which are related to demographic conditions of the respondents. Due to Isapur dam irrigation majority of respondents 79% commented that they have purchased land, their annual income have been increased, they have huge livestock's up to 50 %, some of farmers purchased a tractors, own house their standard of living has been increased. Their food consumption habits has been changed. Overall respondent's response showed good remarkable growth & development in socio economic conditions.

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