

Barna Water Resource Project of Madhya Pradesh, India : An Environmental Impact Assessment



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Abstract : This paper presents the case study of Major Water Resource Project constructed on Barna River a major tributary of river Narmada (M.P., India). The Barna Water Resource Project comprised construction of 47.7 m. high and 432 m. long earthen / masonry Dam, 115 m long spillway and a construction of 318 km of earthen channel to irrigate (37000 + 24000) (Rabi + Kharif) 61000 Ha of land, in most of the villages of Raisen district of M.P., India. The Project is in operation since 1975. The paper critically reviews the environmental and economical development due to this irrigation project. The physical benefits anticipated in the project report are compared with the actual accruing benefits. The after effect of this project analyzed with respect to ground water level, drinking water, rainfall, health factor, soil quality, awareness on sustenance of life, increase of dairy culture etc. Thus, this paper critically analyses an environmental and economical development of the area due to construction of this irrigation project. This case study emphasizes that Water Resources Development should have friendly view with the environment. Lastly we can say that Water resources Development creation is very difficult and to put life into it, requires dedication. The construction of the Barna Project helped in the upliftment of the village people with eco-technological development. The construction of this project ensures the sustainable integrated development by optimal utilization of resources and transfer of technology related to agriculture and irrigation so as to provide self-employment, marketing, training and infrastructure for sustainable development.

Keywords : Command, Submergence, Water-logging, Irrigation.

Introduction :

The Barna Project is located about 2.5 km north west of Barikhurd Village of Tehsil Bari, District- Raisen. The project is 8 km on National Highway No.12 (Jaipur - Jabalpur) from Bari. The nearest Railway Station is Obedullaganj on Central Railway line 66 km away from Dam site. The Project is located 100 km away from the Capital town Bhopal. The location map is shown below in Fig. No.1

Pisciculture :

The reservoir spreading over 7700 Ha provides an excellent opportunity for developing pisciculture. A provision has been made in the project for its development but it was found after site visit that there is scope in this field to do more efforts we may get better results.

Tourism :

The Barna project is only 100 Km away from Bhopal and offers an excellent

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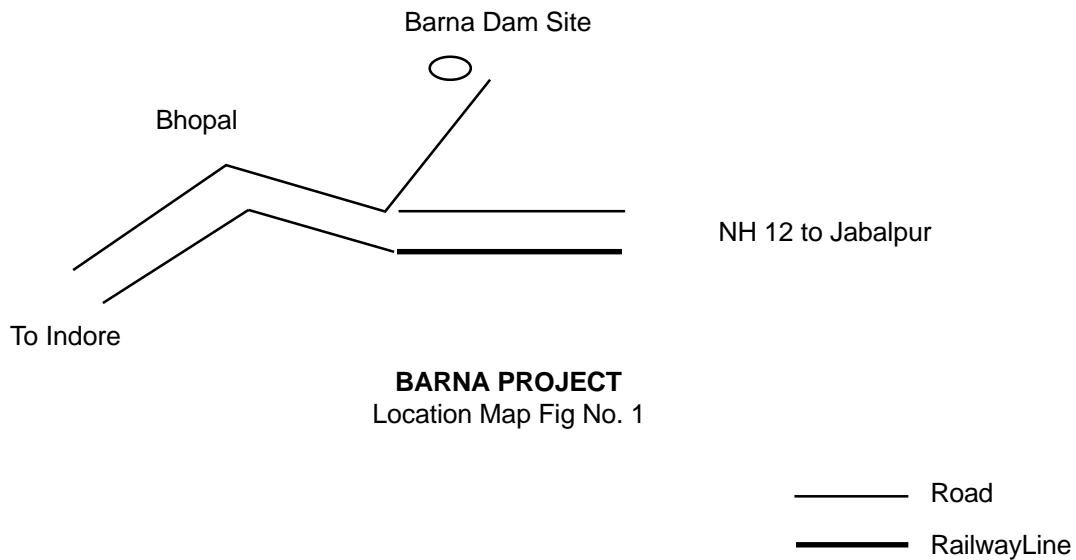


Fig. 1 : Location Map of Barna Project

Salient feature of the dam shown in Table No. 1 below :

Location	1. State 2. District 3. Latitude / Longitude	Madhya Pradesh Raisen 23 ^o 5' N / 78 ^o 7' E
Hydrology	1. Catchment Area 2. Maximum Rainfall 3. Minimum Rainfall 4. Design Flood 5. MWL 6. FTL 7. DSL	1176 Sq. Km. 2068 mm 535 mm 13557 Cumec .351.45 m 348.55 m 338.1 m
Dam	1. Maximum Height 2. Top of dam 3. Length of Earth Dam 4. Top Width	47.7 m 352.70 m 432 m 4.6 m
Canal System	1. GCA 2. CCA 3. Area for annual irrigation 4. Discharge of main canal	72000 ha 55000 ha 61000 ha (37000 + 24000) 30 Cumec
Benefits :	1. Annual Additional yield 2. Annual Value 3. Amount of recovery	1,82,000 Tonnes 24.34 Crore 6.09 Crore
Financial Return	% Return after 10 years Benefit Cost ratio at 10% interest.	0.41 6.23

site for Development of Tourism Potential. A provision was made in the DPR for the construction of Rest house, roads, parks and garden and facilities for water sports, boating, swimming, angling and transport. People of the near by area enjoyed their weekend holiday for picnic to this beautiful spot. Looking to the site condition we really feels a combination of irrigation friendly relationship of irrigation and environment

Additional Yield and Other Benefits:

The increase yield of crops before the construction of Barna Project is to the tune of Rs.1 Crore but after construction of Project this benefit is 24 Crore. This will increase the general standard of living of people in the project command area. The land and property value has also gone up due to the irrigation facilities made available in the command.

Submergence of Land :

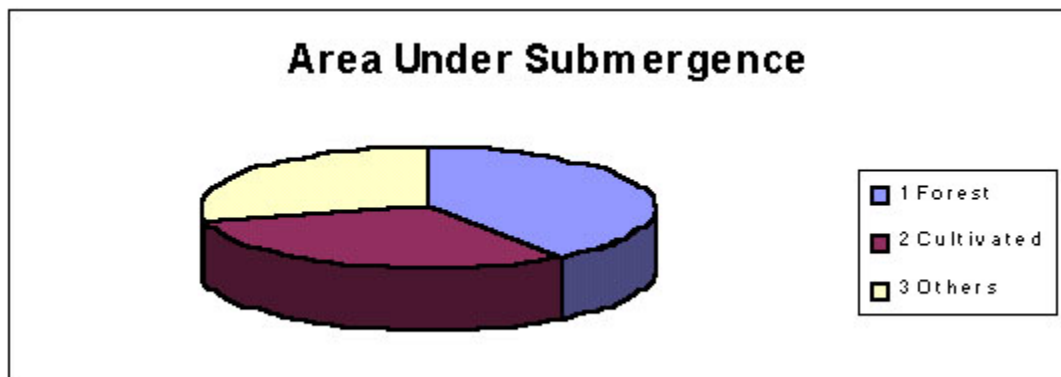
Total 7700 Ha land is submerged due the construction of Barna Project. The details are as below in Fig. No.2 :

Water Logging :

The water logging are generally not found in any area of the command. It was also found during the site visit and discussion with people and officers of irrigation, agriculture department that due to the command area development the local nallas of the region are enriched in their water capacity. The water table of the region wells is also increased. By visiting the field it was observed that the regional well in the command are fully equipped with water throughout the year after the construction of Barna project generally it in the head reaches.

Fisheries Development :

There was no provision of fish



S. No.	Land category	Area under submergence
1	Forest	3080
2	Cultivated	2430
3	Others	2190

Fig. 2 : Shows the submergence of land under Barna Project.

production in the DPR, against this an yearly production of approximate 50 tones per year is being done, having profit of rupee 25 Lakh per year. The probable year wise fish production for last seven years is as below in Table No.2 :

S. No.	Year	Production in tone	Revenue Received in Rs. Lakh
1.	1999	19.115	38
2.	2000	95.343	180
3.	2001	47.637	95
4.	2002	65.229	130
5.	2003	66.679	135
6.	2004	64.740	130
7.	2005	63.50	125

During interaction with the people it was observed that if they provided a good market they would get maximum returns of their efforts, because this work is being done at individual level. No society is formed even no department is initiating regarding improvement of economic status of tribal poor people in the real sense.

Irrigation benefits from Barna Project :

It was found that the irrigation percentage from 2.3% before the construction of this project has been increased to 40% as stated in the project report. The area from 8200 Ha has been increased to 37,000Ha.(only rabi irrigation). The Year wise(last 10-15 year) Rabi Irrigation from Barna Project shown in Fig 3.

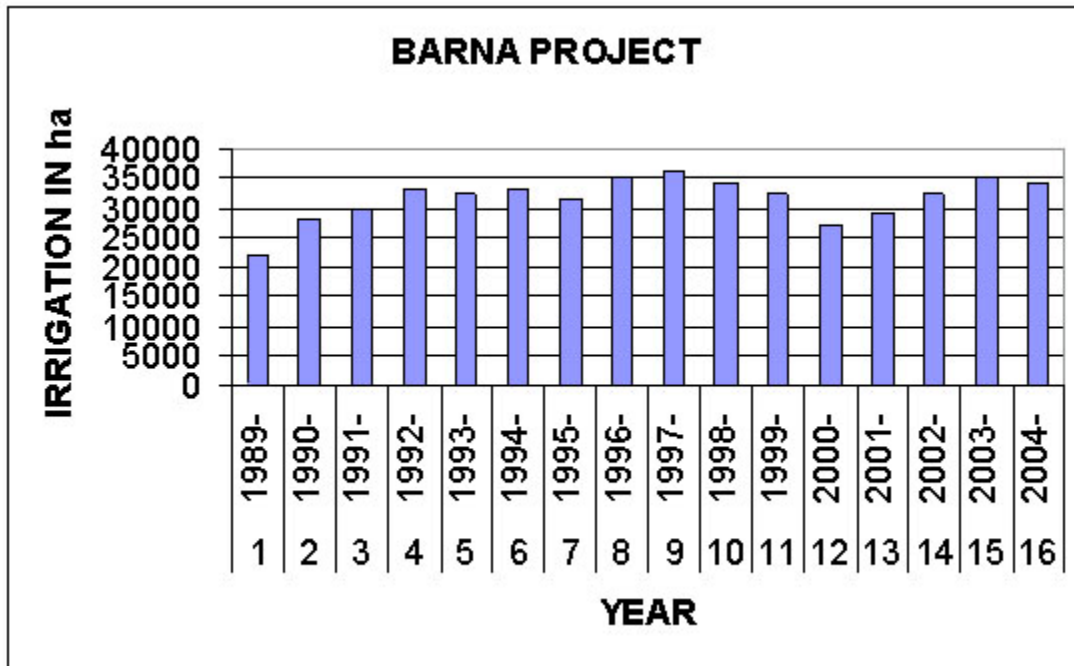
Agriculture Development :

Agriculture development has been increased due to the construction of this project. The production per hectare

increased from 5 to 40 quintals per ha. The command area is shown in the Figure No.4

Concluding Remarks :

The case study vividly depicts the environment-friendly conditions in the catchments, project site, command area and in the scenario of ecology of Barna Project of Madhya Pradesh. The study further helped in assessing the direct and indirect benefits higher than that anticipated in the project report. Sad state of affair is that the criticism by highlighting mere adverse environmental impacts such as submergence of very small percentage of agriculture and forest land has hindered the overall development of irrigation, agriculture, water supply and flood control activities. This Environmental Impact study clearly proves that Barna Project of Madhya Pradesh has tremendously improved friendly environmental conditions in the catchments, project sites, command area and in the field of ecology. It has also provided much higher direct and indirect benefits than anticipated in the project report. It is matter of deep concern that undue and exaggerated criticism by highlighting minor adverse environmental impact (submergence of small % forest and agriculture land) of WRD projects is disastrously costing the nation by halting the vital development of irrigation, agriculture, water supply and flood control etc. The furious overtones of present day debate against large dams show that even the most beneficial projects, reservoirs cannot be allowed to be construct. A judiciously and balanced view is necessary considering direct and indirect benefits as well as cost along with



S. No.	Year	Barna
1	1989-90	22000
2	1990-91	28000
3	1991-92	30000
4	1992-93	33100
5	1993-94	32500
6	1994-95	33300
7	1995-96	31200
8	1996-97	35100
9	1997-98	36400
10	1998-99	34300
11	1999-2000	32300
12	2000-01	27000
13	2001-2002	29000
14	2002-2003	32500
15	2003-2004	35000
16	2004-2005	34300

Fig. 3 : Shows yearwise Rabi Irrigation from Barna project

favorable and adverse environmental impacts of any WRD project rather than blocking the economic development on the basis of assumed factor. The research work is necessary on economic evaluation of indirect benefits and cost and

environmental assessments of Water Resources project.

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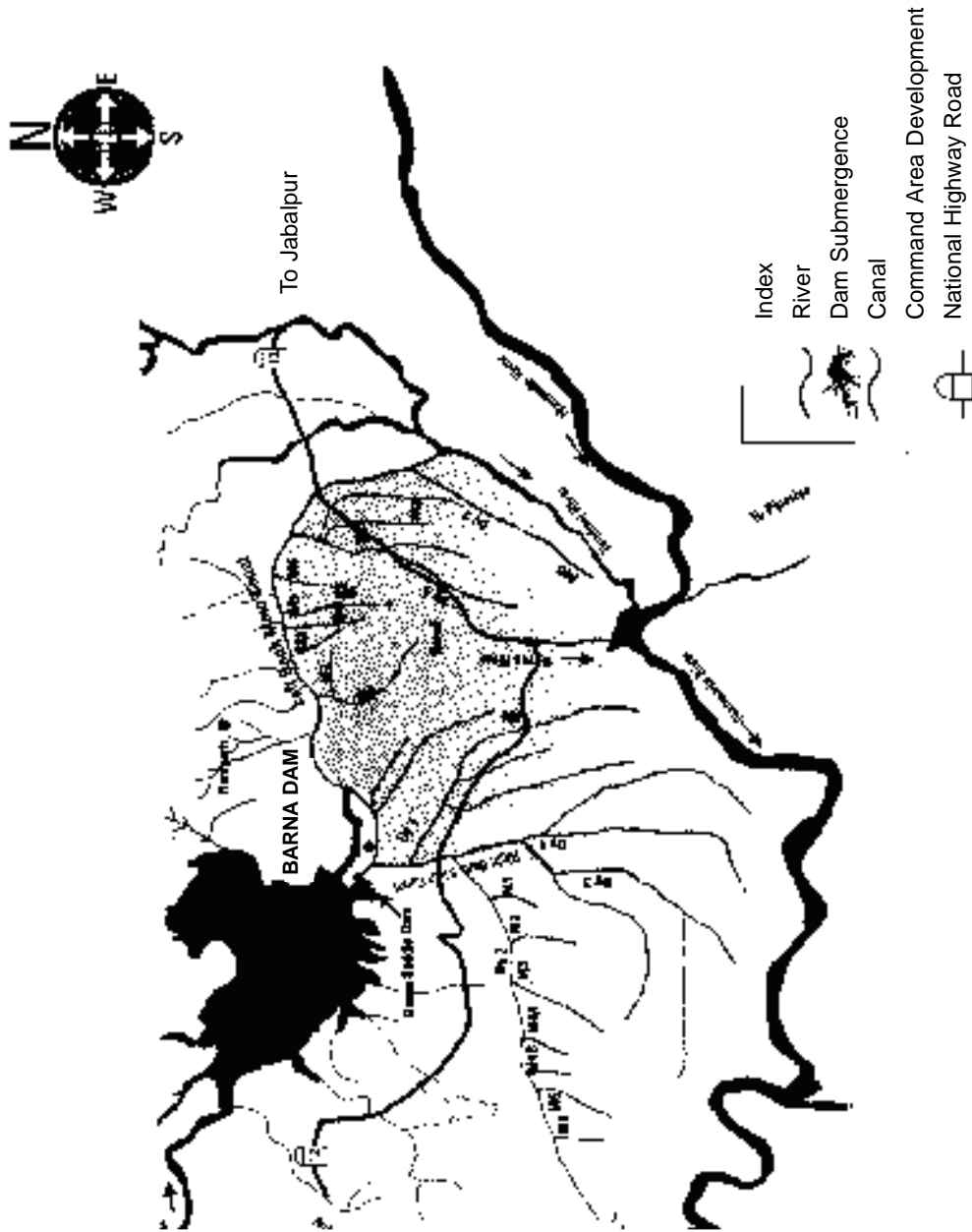


Fig. 4 : Index Map of Barna Project