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Impact of Balram Talab (Farm ponds) as resource management on benefits driven by participant farmers of Dewas district in Madhya Pradesh

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Abstract

Water is not only the most vital requirement of all living organisms but also provides habitat to a significant production of the earth's biodiversity, representing particularly all groups of plants and animals, ranging from the primitive microorganism to large mammals which pass some or all stages in their life cycle in water. On the other hand, human beings depend upon water not only for their biological needs but also for food production and all social and cultural activities. The human activities of extraction of water and no proper utilization pattern, cleaning of natural vegetation, agriculture, settlements, mining and overgrazing impinge upon the water bodies directly or indirectly, often resulting in their shrinkage or total loss due to situation. Water bodies change in water quality and quantity also. To overcome these water problems the conservation, restoration and management of the water bodies is very important task. Farm ponds have great potential to improve agricultural water security through the capture, storage, and provision of water for irrigation. Farm ponds can supply a water source for frost protection, recharge of groundwater, and provide a wide range of additional economic and environmental benefits.

Keeping in view the importance of water availability, Balram Tal Yojana is being implemented in Madhya Pradesh with a view to hold back maximum quantity of rainwater in agricultural fields, augmenting ground water table and increasing irrigation facility. Since the year 2007, there is a provision under the scheme for extending subsidy worth Rs.80 thousand to farmers belonging to general category and up to Rs. 1.00 lakhs for a farmer belonging to SC/ST. About 7518 Balram Talab has been constructed in the state during the last 3 years. The aim of this project is to study the impact of the Balram Tal Yojana on beneficiaries in Dewas district of Madhya Pradesh.

Keywords: Balram Talab, farm pond, water resource, resource management

1. Introduction

The black soils possess great production potential, but general crop productivity of these soils is poor and unstable due to low and uncertain rainfall and inefficient crop management. To improve crop productivity and reduce risk uncertainties, rain water harvesting through dugout ponds is devised as an efficient tool and a detailed discussion in this regard has been carried out in this article. The harvested water can be effectively used to provide lifesaving irrigation to tide over moisture stress during critical stages of crop growth as well as growing of multiple crops around the harvesting structure. This technology proves to help in stabilizing and supporting a large proportion of agriculture in the semi-arid tropics.

Looking to importance of rainwater conservation practices, Government of Madhya Pradesh had started the "Balram Talab" scheme in the year 2007 with the objective to support agricultural activities on a sustainable basis by conservation of rain water in the field. Since 2007 about 8000 beneficiaries have been provided support under the scheme. The beneficiaries under the scheme are general farmers, small and marginal farmers, SC/ST farmers. The Balram Talab Yojana is proving to be a great boon for score of farmers in Madhya Pradesh, where the scheme is helping them reap rich benefits by adding to the profitability of the exercise.

Agriculture accounts for about 21 percent of state gross domestic product in Madhya Pradesh. There are 7.36 million operational holdings covering 16.37 million hectares of land. Of the 15 million hectares of net sown area, about 38 percent is irrigated. Surface water sources account for less than 20 percent of the net irrigated area. The remaining area is irrigated with groundwater.

Farmers in Madhya Pradesh have traditionally realized on groundwater for their irrigation water requirements. In the absence of any significant efforts to recharge groundwater aquifers, groundwater tables have steadily fallen. The water table in some parts of Madhya Pradesh has declined to 200-300 feet below ground level. As a result, the failure rate of existing tube wells has risen significantly and new investments in tube wells either do not yield any water, or yield water for a short time and then stop working. Quite often the water is of poor quality and unfit for irrigation. Coupled with problems relating to water quantity and quality, even those farmers with working tube wells face severe constraints in pumping and using water due to frequent electric power cuts. Agricultural productivity has suffered, along with incomes and livelihoods.

It can be said that there has been a greater realization and concern about the depleting natural resources like water. As a result of rainwater management on storage/harvesting have been initiated by different development agencies. Various approaches are being tried on pilot basis in rain water restoring and harvesting integrated development projects. The present investigation aims to study the impact of the Balram Tal Yojana on beneficiaries in Dewas district of Madhya Pradesh. The data thus generated will be useful to conserve and manage the Balram Tal Yojana properly to achieve sustainable development particularly, in ecologically fragile areas in order to meet the living standards of the rural communities. The restoration of ecological balance and the productivity of various land based activities, which can indirectly generate gainful employment to the rural poor, can be achieved through the effective use of this reliable decision support system.

The objective of this scheme is to conserve rainwater in the field for irrigation. For digging ponds under Balram Tal Yojana, every beneficiary is given 25 percent subsidy, the upper limit of which is Rs 50 thousand. The benefit of the scheme is given to the applicants registered after May 25, 2007. So far more than 8,000 Balram Tal reservoirs have been constructed. Balram Talabs are larger water tanks, which can irrigate up to 50 hectare area.

1.1 Objectives of the study

1. To determine the socio- economic, psychological and communication attributes of the Balram Tal Yojana beneficiaries.
2. Assessment of Balram Tal Yojana to the beneficiaries in terms of economic and social basis.

3. Assessment of Balram Tal Yojana to the beneficiaries with reference to crop production.
4. To find out the association between socio-personal and economic attributes with benefits obtained by beneficiaries through Balram Tal Yojana.
5. To identify the constraints faced by beneficiaries regarding utilization of benefits of Balram Tal Yojana.

2. Materials and methods

In Dewas district, Tonk Khurd block was selected purposively for the study because it has highest number of beneficiaries under Balram Tal Yojana in the district. Tonk Khurd block comprises of 59 villages out of which 10 villages was selected on random basis. A comprehensive list of beneficiaries under Balram Tal Yojana in each village was prepared and among them 150 respondents was selected from the list using on proportional method. The sample of the study has been selected through multi-stage sampling technique. The primary data were collected with the help of interview schedule, which was prepared on the basis of objectives of the study. The data were collected through a well-structured and pre-tested interview schedule. The researcher personally met the respondents and explained to them about the purpose of this study. The entire data were converted transformed into normal score. The independent variable as well as dependent variable was categorized as low, medium and high or the term applicable so far on the basis of score obtained. Keeping in view the objectives of the study and to draw logical conclusion the statistical methods were used in the study depending on the nature of data and type of inference required. Percentage, Mean, Standard Deviation(SD), Correlation Coefficient test, Test of significance and Graph, Chart was used in the study.

3. Result and Discussion

3.1 Assessment of Balram Tal Yojana to the beneficiaries in terms of economic and social basis

Assessment of impact or benefits of Balram Tal Yojana to the beneficiaries in terms of economic and social basis was studied by considering increase or addition in various economic asset and social status components. The existing status of beneficiaries "before and after" the Balram Tal Yojana was documented. 't'-test was used to assess the impact of Balram Tal Yojana to the beneficiaries interms of economic and social basis. The data related to the impact of Balram Tal Yojana is presented in table 1.

Table 1: Distribution of the beneficiaries according to possession of economic asset and social components (n=150)

S. No.	Economic asset and social components	Before Balram Tal Yojana			After Balram Tal Yojana			Increase over before		Rank
		Freq.	%	't' value	Freq.	%	't' value	Freq.	%	
1.	Social Participation	59	39.33	9.83*	121	80.67	24.93*	62	41.33	VII th
2.	Avalied government subsidy	64	42.67	10.53*	114	76.00	21.72*	50	33.33	IX th
3.	Availability of loan	64	42.67	10.53*	122	81.33	25.48*	58	38.67	VIII th
4.	Soil and water erosion controlled	48	32.00	8.37*	122	81.33	25.48*	74	49.33	III rd
5.	Helps in conserving ground water recharge	60	40.00	9.97*	126	84.00	27.97*	66	44.00	VI th
6.	Increased income over previous year	48	32.00	8.37*	120	80.00	24.41*	72	48.00	IV th
7.	Increase in employment availability	62	41.33	8.89*	120	80.00	24.41*	58	38.67	VIII th
8.	Increased household material possession	35	23.33	6.73*	127	84.67	28.68*	92	61.33	I st
9.	Improvement in family living conditions	48	32.00	8.37*	119	79.33	23.92*	71	47.33	V th
10.	Increased savings	33	22.00	6.48*	124	82.67	26.66*	91	60.67	II nd
	Overall average	52	34.67	33.66**	122	81.33	67.54**	70	46.67	

* Significant at 5 percent level

** Significant at 1 percent level

The contents of the table 2 revealed that the highest percentage of the beneficiaries (61.33%) expressed benefits derived from increased household material possession and got rank Ist followed by (60.67%) beneficiaries expressed benefits derived from increased savings and got rank IInd, (49.33%) beneficiaries expressed benefits derived soil and water erosion controlled and got rank IIIrd, (48.00%) beneficiaries expressed benefits derived increased income over previous year and got rank IVth, (47.33%) beneficiaries expressed benefits derived improvement in family living conditions and got rank Vth, (44.00%) beneficiaries expressed benefits derived helps in conserving ground water recharge and got rank VIth, (41.33%) beneficiaries expressed benefits derived social participation and got rank VIIth, (38.67%) beneficiaries expressed benefits derived availability of loan and increase in employment availability and got rank VIIIth and (33.33%) beneficiaries expressed benefits derived availed government subsidy and got rank IXth respectively.

It is clear from the table that there was significant difference in each segment of economic and social basis and overall also in economic and social status of beneficiaries in both the

period i.e. before and after the Balram Tal Yojana. The ‘t’ values of each segment of economic and social aspects as well as overall also had shown highly significant difference before and after the Balram Tal Yojana in the status of beneficiaries indicating improved the economic assets and social components respectively. Thus, it is concluded that there was clear cut difference in the overall possession of economic asset and social status component of beneficiaries during before and after the Balram Tal Yojana. The overall economic and social component analysis revealed that (46.67%) beneficiaries have got additional benefit due to Balram Tal Yojana existing over before possession of economic and social components.

The impact of Balram Tal Yojana on economic assets and social status components of beneficiaries was also analyzed by distribution of farmers on the basis of low, medium and high possession of components at the time of before and after the project. The distribution of beneficiaries as per their possession of economic and social status components is presented in table 2.

Table 2: Impact of Balram Tal Yojana on economic and social components of beneficiaries.

Level of economic and social components					
Before Balram Tal Yojana		After Balram Tal Yojana		Additional over before Balram Tal Yojana	
Category	Frequency	Category	Frequency	Frequency	Percentage
Low	44	Low	34	-10	-6.67
Medium	72	Medium	43	-29	-19.33
High	34	High	73	+39	+26.00
Total	150	Total	150	0	0
‘t’ value	33.66**	‘t’ value	67.54**		

* Significant at 5 percent level

** Significant at 1 percent level

It is apparent from the above table that there is clear difference in the overall level of economic asset and social status component possessions of beneficiaries at the time before and after the project. On the whole the data revealed that Balram Tal Yojana had positive impact on improving the economic and social components of beneficiaries because after the Yojana the number of beneficiaries had low and medium components found to reduce at the rate of (6.67%) and (19.33%) after the project. On the other hand, the number of beneficiaries had high level of component increased at the rate of (26.00%). The overall benefits derived by beneficiaries

in respect of economic and social component the ‘t’ value of the component before and after shows highly significant difference indicating the high impact of Balram Tal Yojana on these components

3.2 Assessment of Balram Tal Yojana to the beneficiaries with reference to crop production:

Assessment of impact or benefits of Balram Tal Yojana as perceived by the beneficiaries in terms of crop production is presented in table 3.

Table 3: Distribution of the beneficiaries according to crop production benefits perceived by them (n=150)

S. No.	Benefit derived in terms of crop production	Before Balram Tal Yojana			After Balram Tal Yojana			Increase over before		Rank
		Freq.	%	‘t’ value	Freq.	%	‘t’ value	Freq.	%	
1.	Increase in improved crop production technology	74	49.33	12.05*	108	72.00	19.57*	34	22.67	V th
2.	Increase in irrigated area	73	48.67	11.89*	110	73.33	20.24*	37	24.67	IV th
3.	Increase in animal husbandry enterprise	73	48.67	11.89*	112	74.67	20.96*	39	26.00	II nd
4.	Increase in cropped area	74	49.33	12.05*	111	74.00	20.59*	37	24.67	IV th
5.	Increase in cultivation of cash crop area	69	46.00	11.27*	113	75.33	20.61*	44	29.33	I st
6.	Increase in productivity	69	46.00	11.27*	107	71.33	19.26*	38	25.33	III rd
	Overall average	72	48.00	36.41**	110	73.44	52.71**	38	25.33	

* Significant at 5 percent level

** Significant at 1 percent level

The contents of the table 3 revealed that the highest percentage of the beneficiaries (29.33%) expressed benefits derived from increase in cultivation of cash crop area and got rank Ist followed by (26.00%) beneficiaries expressed benefits derived from increase in animal husbandry enterprise and got

rank IInd, (25.33%) beneficiaries expressed benefits derived increase in productivity and got rank IIIrd, (24.67%) beneficiaries expressed benefits derived increase in irrigated area and increase in cropped area and got rank IVth and (22.67%) beneficiaries expressed benefits derived increase in

improved crop production technology and got rank Vth respectively.

It is clear from the table that there was significant difference in each segment of crop production benefits perceived by beneficiaries and overall also in benefit derived by beneficiaries in respect of crop production at both the period i.e. before and after the Balram Tal Yojana. The 't' values of each segment of crop production benefits perceived by beneficiaries as well as overall also had shown highly significant difference before and after the Balram Tal Yojana in the level of benefits in respect of crop production by beneficiaries indicating improved the crop production technology and agricultural development respectively. Thus,

Table 4: Impact of Balram Tal Yojana on benefit obtained in respect of crop production.

Level of benefit obtained in respect of crop production					
Before Balram Tal Yojana		After Balram Tal Yojana		Additional over before Balram Tal Yojana	
Category	Frequency	Category	Frequency	Frequency	Percentage
Low	52	Low	34	-18	-12.00
Medium	50	Medium	47	-3	-2.00
High	48	High	69	+21	+14.00
Total	150	Total	150	0	0
't' value	36.41**	't' value	52.71**		

* Significant at 5 percent level

** Significant at 1 percent level

It is apparent from the above table that there is clear difference in the overall level of benefits obtain by beneficiaries in respect of crop production components at the time before and after the project. On the whole the data revealed that Balram Tal Yojana had positive impact on improving the crop production components of beneficiaries because after the Yojana the number of beneficiaries had low and medium components found to reduce at the rate of (12.00%) and (2.00%) after the project. On the other hand, the number of beneficiaries had high level of component increased at the rate of (14.00%). The overall benefits derived by beneficiaries in respect of crop production component the 't' value of the component before and after shows highly significant difference indicating the high impact of Balram Tal Yojana on these components.

3.3 Association between socio economic, psychological and communicational attributes with benefit obtains by beneficiaries through Balram Tal Yojana in respect of economic and social components.

Correlation coefficient

Correlation speaks about the relationship between the two attributes and the strength of relationship is measured in terms of correlation coefficient, whose limit range from minus unit to plus unit. If the increase in one variable result in the increase of the other variable, the relationship is positive and if it result in decrease of other variable the relationship is negative. The two variables are not correlated if the increase or decreases of one variable do not affect the other variable.

Zero order correlation coefficient between socio economic, psychological and communicational attributes of beneficiaries of Balram Tal Yojana and benefits obtained by beneficiaries through Balram Tal Yojana in respect of economic and social basis were estimated and presented in table 5.

it is concluded that there was clear cut difference in the overall increase in crop production components of beneficiaries during before and after the Balram Tal Yojana. The overall crop production component analysis revealed that (25.33%) beneficiaries have got additional benefit due to Balram Tal Yojana existing over before crop production components.

The impact of Balram Tal Yojana on crop production components of beneficiaries was also analyzed by distribution of farmers on the basis of low, medium and high benefits obtained at the time of before and after the project. The distribution of beneficiaries as per their benefit obtained in crop production components is presented in table 4.

Table 5: Relationship between socio economic, psychological and communicational attributes of beneficiaries and benefits obtained by beneficiaries through Balram Tal Yojana in respect of economic and social basis

S. No.	Characteristics	'r' value
1.	Age	0.737*
2.	Education	0.129*
3.	Source of irrigation	0.391*
4.	Size of land holding	0.205*
5.	Crop diversification	0.647*
6.	Procurement of Irrigated area	0.031 N.S.
7.	Increase in production of crops	0.911*
8.	Social participation	0.067 N.S.
9.	Economic motivation	0.083 N.S.
10.	Attitude towards Balram Tal Yojana	0.037 N.S.
11.	Extension participation	0.753*
12.	Information seeking behavior	0.121 N.S.

* Significant at 1% level of probability

** Significant at 5% level of probability

NS = non significant

The results of correlation analysis ('r' values) in above table revealed that characteristics namely age (0.737*), education (0.129*), source of irrigation (0.391*), size of land holding (0.205*), crop diversification (0.647*), increase in production of crops (0.911*) and extension participation (0.753*) were found to positive and significant at 1.00 percent level related to economic and social benefit obtained by the beneficiaries of Balram Tal Yojana respectively..

On the other hand, the characteristics namely procurement of irrigated area (0.031 N.S.), social participation (0.067 N.S.), economic motivation (0.083 N.S.), attitude towards Balram Tal Yojana (0.037 N.S.) and information seeking behavior (0.121 N.S.) were found to positive but non-significant related to economic and social benefit obtained by the beneficiaries of Balram Tal Yojana respectively.

3.4 Constraints faced by beneficiaries regarding utilization of benefits of Balram Tal Yojana

During investigation, beneficiaries of Balram Tal Yojana

expressed many constraints regarding utilization of benefits of the project. The data in table 6 provides information about the constraints expressed by the beneficiaries.

Table 6: Constraints faced by beneficiaries regarding utilization of benefits of Balram Tal Yojana (n=150)

S. No.	Constraints	Frequency	Percentage	Rank
A.	Socio economic constraints	85	56.67	VI th
1.	Poor education status of farmers	75	50.00	iii
2.	Conservativeness of villagers	95	63.33	i
3.	Poor economic condition of the farmers	86	57.33	ii
B	Administrative Constraints	105	70.00	III rd
1.	Non co-operation by institutional agency	124	82.67	i
2.	Lack of proper marketing facilities	105	70.00	iii
3.	Lack of subsidy and incentives	97	64.67	iv
4.	Poor contact between farmers and officers	112	74.67	ii
5.	Lack of guidance and advice by institutional agency	86	57.33	v
C.	Technical Constraints	112	74.67	II nd
1.	Lack of technical guidance and supervision	96	64.00	v
2.	Lack of communication facilities	109	72.67	iii
3.	The officials are technically incapable	132	88.00	i
4.	Lack of proper training at grass root level	121	80.67	ii
5.	Non availability of appropriate literature	100	66.67	iv
D.	Other Constraints	118	78.67	I st
1.	Lack of immediate returns in the program	117	78.00	ii
2.	Non availability of loan at time	124	82.67	i
3.	Lack of right information at proper time	114	76.00	iii

The above constraints are grouped under different subheads i.e. socio economic constraints, administrative constraints, technical constraints and other constraints which are discussed separately as below. The finding also depicted that the majority of beneficiaries expressed most serious problem was other constraints expressed by (78.67%) beneficiaries and got rank Ist followed by technical constraints expressed by (74.67%) beneficiaries and got rank IInd, administrative constraints expressed by (70.00%) beneficiaries and got rank IIIrd and socio economic constraints expressed by (56.67%) beneficiaries and got rank IVth respectively.

Among the “socio economic constraints”, conservativeness of villagers was most serious problem as experienced by the (63.33%) beneficiaries followed by poor economic condition of the farmers (57.33%) and poor education status of farmers (50.00%) respectively.

Among the “administrative constraints”, non-co-operation by institutional agency was most serious problem as experienced by the (82.67%) beneficiaries followed by poor contact between farmers and officers (74.67%), lack of proper marketing facilities (70.00%), lack of subsidy and incentives (64.67%) and lack of guidance and advice by institutional agency (57.33%) respectively.

Among the “technical constraints”, the officials are technically incapable was most serious problem as experienced by the (88.88%) beneficiaries followed by lack of proper training at grass root level (80.67%), lack of communication facilities (72.67%), non-availability of appropriate literature (66.67%) and lack of technical guidance and supervision (64.00%) respectively.

Among the “other constraints”, non-availability of loan at time was most serious problem as experienced by the (82.67%) beneficiaries followed by lack of immediate returns in the program (78.00%) and lack of right information at proper time (76.00%) respectively.

5. Conclusion

It can be concluded that age, education, source of irrigation, size of land holding, crop diversification, increase in

production of crops and extension participation characteristics of beneficiaries indicating have a strong contribution and higher in frequency of these characteristics will results higher of benefit obtain in respect of economic and social components. It is also found that procurement of irrigated area, social participation, economic motivation, attitude towards Balram Tal Yojana and information seeking behavior characteristics of beneficiaries indicating that higher in frequency of these characteristics will results higher of benefit obtain in respect of economic and social components.

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