

Impact of Watersheds in Bringing Change in the Farming System in Bastpur of Morena District of Madhya Pradesh.

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ABSTRACT

The study was carried out in Bastpur micro watershed in Morena block of the Morena district of Madhya Pradesh during 2010-11. To assess the impact of watershed development programme in farming system. It could be found that the overall watershed development practices in the study area have positive and effective changes in agricultural area of bajra, and arhar, cropping productivity of gram and arhar, land use, use of land resources, water resources, and livestock due to increase in availability of water and use to improved agricultural inputs like improved seeds, recommended doses of fertilizers, required irrigation, plant protection measures, etc in the study area. It was also found positive change in agricultural land, irrigated area, area under horticultural and vegetables crops. Similarly cattle population was also increased due to sufficient availability of water and fodder in watershed area.

Key words: Watershed programme, area, productivity, livestock.

INTRODUCTION

Soil and water are the basic resources and these must be conserved as carefully as possible. The pressure of increasing population neutralizes all efforts to raise the standard of living, while loss of fertility in the soil itself nullifies the value of any improvements made. This calls for more systematic resource conservation efforts. It is well known to every farmer that it is the top soil layer, which sustains agricultural production. Once this layer is lost or eroded, nothing can be done to replace it within a short period of time. Climate and hydrology, soil topography, soil surface conditions and their interactions are major factors affecting erosion-sedimentation processes. The semi-arid regions with few intense rainfall events and poor soil cover condition produce more sediment per unit area. But the man's intervention has disturbed the natural equilibrium and intensive and extensive agriculture has become a dominant factor in accelerating land degradation. The ever-increasing population

pressure has brought intensive cultivation of land to the forefront through irrigated agriculture. No doubt these practices have resulted in a great increase in productivity, but they have resulted in large-scale water logging. Cultivable wastelands are increasing in the agricultural fields due to improper land management. The obvious remedy for this is to follow soil and moisture conservation practices along with integrated nutrient supply system for improvement of soil fertility as well as crop productivity on sustained basis. Soil conservation in any form is the only known way to protect the productive lands. In a predominantly agricultural country like India, where droughts and floods cause chronic food scarcity, adequate soil conservation programme, not only increases crop yield, it also prevents further deterioration of land. Methods to control surface runoff and soil associated erosion have been practiced in India from times immemorial. The Bastpur micro watershed developed under Rajiv Gandhi Watershed Mission (RGWM) during 2005-06 to 2010-11 at Morena block of morena district of

Madhya Pradesh having 500 hectare. Watershed secures availability of water in particular area. After the availability of sufficient water in particular area, which impact may be found. The impact of this micro-watershed on different aspect of agricultural production, structural, operational, and extent of technological adoption needs to be examined. Hence the present study was under taken to the *Impact of Watersheds in Bringing Change in the Farming System in Bastpur of Morena District of Madhya Pradesh*.

interview schedules were used for obtaining data and were compared with the data collected for the benchmark survey and from Patwari records. The secondary data for year 2010-11 were collected from the own survey and project records from Govt. offices. Simple percentage distribution statistical methods were used for analysis of data. The impact of watershed development programme was studied in terms of change in area under different crops, productivity, land use pattern, land resources use, Change in water resources, and livestock status.

METHODOLOGY

The *Bastpur* Micro Watershed of Morena district was purposively selected for this study during 2010-11. Out of 250 farmers, 50 beneficiary farmers were selected randomly for the study. All the farmers, who were selected as respondents for the benchmark survey of this project in year 2005-06, were used for this study. For the study, pre testing

RESULT AND DISCUSSION

Change in area

The data presented in table-1 revealed that total area under crops increased after implementation of watershed programme in the *Bastpur* watershed area. The positive changes were observed in the area of Arhar (300%) in *Kharif* and wheat (366.67 %) in Rabi season over the period of implementation.

Table 1: Change in area of major crops in micro WS- Bastpur after implementation of watershed programme

Major crops(ha)	Pre-project status(ha)	Post-project status(ha)	Absolute change (ha)	Relative change (%)
Kharif crops				
Bajra,	60	116	+56	93.33
Arhar	10	40	+30	300.00
Rabi crops				
Wheat	15	70	+55	366.67
Mustard	60	70	+10	16.67
Gram	47	48	+1	2.13

Table 2: Change in productivity of major crops in micro WS- Bastpur after implementation of watershed programme

crops	Pre-project status(ha)	Post-project status(ha)	Absolute change (ha)	Relative change (%)
Kharif crops				
Bajra	17	20	+3	17.65
Arhar	12	15	+3	25.00
Rabi crops				
Wheat	30	33	+3	10.00
Mustard	12	14	+2	16.67
Gram	10	12	+2	20.00

Whereas, change occurs in the area of mustard. However, no reduction was observed in the area of gram (2.13%). The figures implies that due to Insufficient availability of irrigation water, timely availability of agricultural Inputs and training imparted by extension agents, after implementation of watershed programme. Area of crops like wheat, which need timely irrigation, has significantly increased. Thus, the positive change clearly indicates the healthy impacts in the study area due to watershed development programme.

Change in productivity

The impact of watershed development programme is also studied in terms of crop productivity

from the post project status. It can be evident from the table-2. That the highest increment in productivity was observed in Arhar (25.00%) and Gram (20.00%) followed by Bajra(17.65%).and Mustard (16.67%). The productivity of Wheat also increased by (10.00%) after the project implementation period. Due to watershed development programme farmers used modern inputs like high yielding varieties, recommended doges of fertilizers, timely irrigation and use of plant protection measures etc. may increased the productivity of crops.

Change in land use pattern

The impact of watershed development programme in terms of change in land use pattern

Table 3: Change in land use pattern in micro WS- Bastpur after implementation of watershed programme

Change in land use pattern	Pre-project status(ha)	Post-project status(ha)	Absolute change (ha)	Relative change (%)
Arable land (ha)	188	188	+0	0.00
Non-arable land (ha)	312	312	0	0.00
Change in cropping intensity (%)	65%	135%	+70	107.69
Increase in Agricultural land (ha)	120	188	+68	56.67
Change in area under irrigation(ha)	15	70	+55	366.67

Table 4: Change in land resources use activities in micro WS-Bastpur after implementation of watershed programme

Change in land resources use activities (ha)	Pre-project status(ha)	Post-project status(ha)	Absolute change (ha)	Relative change (%)
Increase area under pasture	10	24	+14	140.00
Increase in area under horticulture crops	0	3	+3	100.00
Increase in vegetation area.	0	22	+22	100.00
Status of waste land development.	0	44	+44	100.00

Table 5: Change in water resources in Micro WS- Bastpur after implementation of watershed programme

Change in water resources	Pre-project status	Post-project status	Relative change (%)
Number of soil and water conservation structure	0	16	1600
Number of Wells	2	4	100
Number of Hand pump	10	14	40

Table 6: Change in livestock status in Micro WS-Bastpur after implementation of watershed programme

Live stock	Pre-project status (No.)	Post-project status (No.)	Absolute change (No.)	Relative change (%)
Cow	22	38	+16	72.73
Bullock	40	46	+6	15.00
Buffalos	74	102	+28	37.84
Sheeps	145	266	+121	83.45
Goats	90	140	+50	55.56
birds	22	38	+16	72.73
fodder availability (qt.)	150	400	+250	166.67

is presented in table-3. Availability of arable and non-arable land was not affected. The study showed that the average cropping intensity was observed 135% as compare to 65% in bench mark of survey during the year 2005-6 in bastpur watershed area. An increase in agricultural and irrigated area about (56.67%) and (366.67%) respectively in watershed area in the year 2010-11 as compared to starting of the programme 2005-06. Thus, it could be inferred that due to the participation in the watershed management activities farmers were able to gear up their adoption on soil and water conservation practices.

Change in land resources

Highly positive change was noticed in area of pasture land (140%), area under horticultural crops (100%) and vegetation of the watershed area (100%), due to wasteland development. Which was nil at the time of benchmark survey in the year 2005-06. Thus, the positive change clearly indicates healthy impact by the adoption on horticultural and forestry practices. Forestry programme was observed only on wasteland, panchayat and government land, very few farmers planted forest plants, bushes and grasses in the study area. This might be due to marginal and small land holdings, where they preferred to grow food grain crops rather than the tree plantation.

Change in water resources

The data presented in Table-5 revealed that no soil and water conservation structures were constructed before implementation of watershed development programme. Whereas, 16 numbers of structures have been constructed after watershed development programme. Due to increase in ground

water status some new wells and hand pumps also constructed for improvement of drinking water facilities Water run-off reduced by small structures resulted in increased agriculture area. Wells and hand pumps, which used to dry up during the summers have been converted into perennial sources of water, the conservation of soil in the farms has resulted in the better productivity of crops in the watershed development programme.

Change in livestock status

The data in table-6 revealed that before project implementation, livestock population was less as compared to after project implementation. The positive change in livestock population was found due to improvement by training which given by the veterinary doctors and of fodder availability, balanced feeding of animals and vaccination in animals has also increased in the area. Watershed management was showed positive impact on farming community.

CONCLUSION

It could be concluded that the overall watershed management practices in the study area have positive and effective changes on agricultural area, crop productivity, land use, use of land resources, water resources, and livestock due to increase in availability of water in the watershed area. It was also found positive change in agricultural land (56.67%), irrigated area (366.67%), cropping intensity (107.69%), area under horticultural and vegetables crops. Similarly cattle population was also increased due to sufficient availability of water and fodder in watershed area. The results

of the study suggested that appropriate steps needed to be taken by the farmers for rational use of cultivated land, wasteland, forests and other common property resources. The co-ordination of farmers and government functionaries, land

development activities were some of the measures for improving the Bastpur Micro Watershed. Better co-ordination between development agencies and voluntary organizations is also essential for effective implementation of watershed programme.

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