

Impact of National Watershed Mission Development Programme in Rahugaon of Morena District of Madhya Pradesh

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ABSTRACT

A Study was conducted in Rahugaon micro watershed in Sabalgarh block of Morena district of Madhya Pradesh during 2010-11 to assess the impact of National Watershed Mission Development Programme in Rahugaon of Morena District. A benchmark survey was under taken on management practices. Positive effect of programme was noticed in increase in area of arhar, bajra and wheat while productivity of gram and arhar was increased with a change in agricultural area, irrigated area, cropping intensity, water resources and increased in area of horticultural crops. Increased pasture and vegetation area were increased; Soil and water conservation structure and water resources were increase. The cattle population was also increased due to sufficient water and fodder availability. The co-ordination of farmers and government functionaries, land development activities were some of the measures taken to improve the Rahugaon Micro Watershed. Better co-ordination between development agencies and voluntary organizations is also essential for effective implementation of watershed programme

Key Words- Watershed programme, Area, Productivity, Livestock, Land use pattern

The watershed may be nearly flat or may include hillocks, hills or mountains each and every water and land area is a part of one watershed or other. Frequently the following distinction is being made to indicate the size of a watershed: micro watershed, sub watershed, watershed, catchment and river basin in order to increase size. Generally any watershed can be sub-divided into sub-watersheds. The smallest watershed in the context of agricultural hydrology may be the field or plot. Furthermore within the context of watershed management, watershed may be defined as the ecosystem within the confines of a drainage. Essentially a watershed is all the land and water area, which contributes runoff to a common point. It is a land area that captures rainfall and conveys the overland flow and runoff to an outlet in the main flow channel. It is a topographically delineated area draining into a single channel. 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 but 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 Rahugaon micro watershed developed under National Watershed Mission (NWSM) during 2005-06 to 2010-11 at Sabalgarh 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, its impact may be found. The impact of this micro-watershed on different aspects of agricultural production, structural, operational, and extent of technological adoption needs to be examined. Hence the present study was undertaken as Impact of National Watershed Mission development programme in Rahugaon in Morena district Madhya Pradesh.

METHODOLOGY

The Rahugaon 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 tested interview schedules were used for obtaining data and were compared with the data collected for the benchmark survey 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 method 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.

RESULTS 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 Rahugaon watershed area. The positive changes were observed in the area of arhar (225%) in Kharif and wheat (233.33 %) in Rabi season over the period of implementation and change was occurred in the area of mustard. However, no reduction was observed in the area of gram (-38.00%). 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.

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

Sr. No.	Major crops(ha)	Pre-project status(ha)	Post-project status(ha)	Absolute change (ha)	Relative change (%)
	Kharif crops				
1	Bajra,	130	162	+32	24.62
2	Arhar	20	65	+45	225.00
	Rabi crops				
3	Wheat	30	100	+70	233.33
4	Mustard	165	165	+0.00	0.00
5	Gram	100	62	38.00	-38.00

Change in productivity

The impact of watershed development programme was also studied in terms of crop productivity from the post project status. It was evident from the Table-2 that the highest increase in productivity was observed in arhar (25.00%) and gram (16.67 %) followed by bajra(11.11%).and mustard (14.29%). The productivity of wheat also increased by (11.76 per cent) after the project implementation period. Due to watershed development programme farmers used modern inputs like high yielding varieties, recommended doses of fertilizers, timely irrigation and use of plant protection measures. This might have increased the productivity of crops.

Table 2
Change in productivity of major crops in micro WS- Rahugaon after implementation of watershed programme.

Sr. No.	Crops	Pre-project status (qt /ha.)	Post-project status (qt /ha.)	Absolute change	Relative change (%)
	Kharif crops				
1.	Bajra	18	20	+2	11.11
2.	Arhar	12	15	+3	25.00
	Rabi crops				
3.	Wheat	34	38	+4	11.76
4.	Mustard	14	16	+2	14.29
5.	Gram	12	14	+2	16.67

Change in land use pattern

The impact of watershed development programme in terms of change in land use pattern 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 190 per cent as compared to 95 per cent in bench mark of survey during the year 2005-06 in Rahugaon watershed area. An increase in agricultural and irrigated area about (10.85 per cent) and (33.77 per cent) 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.

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

Sr. No.	Change in land use pattern	Pre-project status	Post-project status	Absolute change	Relative change (%)
1.	Arable land (ha)	327	327	0	0.00
2.	Non-arable land (ha)	173	173	0	0.00
3.	Change in cropping intensity (%)	95%	190%	+95	105.00
4.	Increase in Agricultural land (ha)	295	327	+32	10.85
5.	Change in area under irrigation(ha)	77	103	+26	33.77

Change in land resources

Table is indicated that highly positive change was noticed in area of pasture land (60 per cent), 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 indicated healthy impact by the adoption of 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.

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

Sr. No.	Change in land resources use activities (ha)	Pre-project status	Post-project status	Absolute change	Relative Change (%)
1.	Increase area under pasture	25	75	+50	600.00

2.	Increase in area under horticulture crops	0	12	+12	100.00
3.	Increase in vegetation area.	0	10	+10	100.00
4.	Status of waste land development.	0	40	+40	100.00

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, Five conservation structures have been constructed after watershed development programme. Due to increase in ground water status some new wells and hand pumps were also constructed. For improvement of drinking water facilities, water run-off was 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 on the farms has resulted in the better productivity of crops in the watershed development programme.

Table 5
Change in water resources in micro WS- Rahugaon after implementation of watershed programme

Sr. No.	Change in water resources	Pre-project status	Post project status	Relative change (%)
1.	Number of soil and water conservation structure	0	5	500
2.	Improvement of drinking water facilities			
3.	Number of wells	2	4	100
4.	Number of hand pump	8	2	50

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 training given by veterinary doctor and fodder availability, Balanced feeding of animals and vaccination in animals have also increased in the area.

Watershed management showed positive impact on farming community.

Table 6
Change in livestock status in micro WS Rahugaon after implementation of watershed programme

Sr. No.	Live stock	Pre-project status (No.)	Post-project status (No.)	Absolute change (No.)	Relative change (%)
1.	Cows	120	157	+37	30.83
2.	Bullocks	44	63	+19	43.18
3.	Buffalos	78	122	+44	56.41
4.	Sheeps	60	85	+25	41.67
5.	Goats	80	100	+20	25
6.	birds	170	220	+50	29.41
7.	fodder availability (qt.)	100	300	+200	200

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 that 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 Rahugaon micro watershed. Better co-ordination between development agencies and voluntary organizations is also essential for effective implementation of watershed programme.

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