

## Impact of agricultural technology management agency (ATMA) on crop diversification in Mandla and Dindori districts of Madhya Pradesh

A. SHARMA, N. K. KHARE AND <sup>1</sup>H. L. SHARMA

Department of Extension Education, <sup>1</sup>Department of Mathematics and Statistics  
College of Agriculture, Jawaharlal Nehru Krishi Vishwa Vidyalaya  
Jabalpur-482004, Madhya Pradesh

Received : 20-07-2017; Revised : 12-08-2017 ; Accepted : 24-08-2017

### ABSTRACTS

The present study was carried out during 2017 in the Mandla and Dindori districts of Madhya Pradesh state. This study was conducted in randomly selected 300 villages of four purposively selected blocks i.e. Mandla and Nainpur located in Mandla district similarly Dindori and Mehandwani located in Dindori district. A total of 300 respondents including 150 Mandla and 150 Dindori farmers were selected randomly. The data collection was done by the use of interview schedule through personal interview. Data were analyzed with help of suitable statistical tools. The findings concluded that there is positive impact of ATMA on productivity of various crops. It is evident from the result that there is positive and good impact found in ATMA respondents in terms of increasing the area and increasing the productivity and production of crop.

**Keywords:** ATMA, crop diversification, percentage change, tribal farmers

The cropping pattern in this study indicates the area under different crops grown in various crop season. Cropping pattern of an area is dependent upon the agro-climatic condition, availability of technological inputs and extent of investment. Cropping pattern in different area continue to change over time due to socio-economic factors. From the 1970s to the early 1990s, the Training and Visit (T&V) project was implemented with the support of the World Bank. T&V was the primary machinery for technology dissemination in the public-sector agricultural extension system of India. However, it worked only through each state's department of agriculture because the focus was on crop production, particularly cereal crops. It was first introduced on a pilot basis in the Chambal command area in Rajasthan and Madhya Pradesh, with positive results. Since then, because of reduced impact and decline in political support, agricultural extension has received less funding than previously and the states could not sustain the T&V, though elements continued in different states (Anderson 2007).

The decision making process is decentralized to the block level, with active participation of farmer representatives in the approval of the BAP. The SREP and SEWP are the instruments that promote convergence of extension activities between line departments and research institutions. In each state, a state agricultural management and extension training institute (SAMETI) is established. The purpose of this institute is to provide training and human resource development on the concepts and processes of ATMA to the junior and middle-level extension functionaries (MANAGE, 2010).

Keeping in view of the above facts in to consideration, the present study was undertaken to assess

the impact of ATMA on the crop diversification of the respondents.

### MATERIALS AND METHODS

This study was conducted in Mandla and Dindori districts of Madhya Pradesh, during the year 2016-17. Madhya Pradesh state has 51 districts out of which both districts were selected purposively because this districts have got highest fund for the ATMA programme. From the selected districts only two blocks from each district i.e., Mandla and Nainpur, Dindori and Mehandwani were selected purposively. From each selected block out of total villages, 150 villages in Mandla, 150 villages in Nainpur, 150 villages in Dindori and 150 villages in Mehandwani block have been selected by Government of Madhya Pradesh for carrying out the various activities under ATMA project. Thus total 600 villages were considered for the study. From selected block (1 block = 150 villages = 75 farmer friend) 75 respondents were selected randomly from each selected villages. Thus, the total 300 farmer friends (2 villages = 1 farmer friend) were selected to determine the impact of ATMA programme on change in cropping pattern of the farmers. Respondents were interviewed through personal interview. Prior to interview, respondents were taken in to confidence by revealing the actual purpose of the study and full care was taken in to consideration to develop good rapport with them. For the data collection well designed and pre-tested interview scheduled were used.

### RESULTS AND DISCUSSION

#### *Change in farming system*

The data given in table-1 indicates that in kharif season all the respondents were growing rice crops. Out

**Table 1: Distribution of respondents according to major crops grown**

Crops	Mandla (n=150)			Dindori (n=150)		
	Number of farmers	Area hectare	%	Number of farmers	Area hectare	%
<i>Khariif</i>						
Paddy	146	227.04	84.71	150	392.00	76.14
Pigeon pea	68	26.96	10.05	19	21.28	4.13
Maize	3	1.70	0.63	22	24.00	4.66
Kodo	7	4.50	1.67	17	24.30	4.72
Kutki	4	3.00	1.11	10	11.00	2.13
Sugarcane	1	3.00	1.11	-	-	-
Niger	-	-	-	44	42.25	8.20
Others	2	2.00	0.74	00	00.00	00.00
<b>Total cropped area</b>		<b>268.2</b>			<b>514.83</b>	
<i>Rabi</i>						
Wheat	87	132.08	64.45	60	114.40	28.09
Gram	57	64.65	31.54	126	230.60	56.64
Paddy	1	3.00	1.46	-	-	-
Lentil	-	-	-	44	47.62	11.69
Sugarcane	-	-	-	-	-	-
Others	7	5.20	2.53	17	14.50	3.56
<b>Total cropped area</b>		<b>204.93</b>			<b>407.12</b>	

**Table 2: Impact of ATMA on crop diversification in Mandla and Dindori district**

Heads	Mandla (n=150)			Dindori (n=150)		
	2010-11	2016-17	% change	2010-11	2016-17	% change
<b>Crop diversification (in hectare)</b>						
<i>Khariif</i>						
Paddy	203.90	227.04	11.34	311.17	392.00	25.97
Pigeon pea	9.86	26.96	173.42	30.53	21.28	-30.29
Maize	9.61	1.70	-82.31	17.50	24.00	37.14
Kodo	18.31	4.50	-75.42	56.86	24.30	57.26
Kutki	5.75	3.00	-47.82	30.76	11	-64.24
Sugarcane	11.44	3.00	-73.77	-	-	-
Niger	-	-	-	63.00	42.25	-32.93
Others	7.63	2.00	-73.78	00.00	00	00.00
<b>Total cropped area</b>	<b>266.5</b>	<b>268.2</b>	<b>0.63</b>	<b>509.82</b>	<b>514.83</b>	<b>0.98</b>
<i>Rabi</i>						
Wheat	117.94	132.08	11.98	114.75	114.40	-0.30
Gram	56.57	64.65	14.28	213.05	230.60	8.23
Paddy	0.00	3.00	-	-	-	-
Lentil	3.00	0.00	-100.00	25.75	47.62	84.93
Sugarcane	4.50	0.00	-100.00	-	-	-
Others	2.70	5.20	92.59	11.00	14.50	31.81
<b>Total cropped area</b>	<b>184.71</b>	<b>204.93</b>	<b>10.94</b>	<b>364.55</b>	<b>407.12</b>	<b>11.67</b>

**Table 3: Impact of ATMA programme on crop productivity (q hectare<sup>-1</sup>)**

Crops	Mandla (n=150)		% change	Dindori (n=150)		% change
	2010-11	2016-17		2010-11	2016-17	
<i>Kharif</i>						
Paddy	27.24	93.44	243.02	5.68	8.26	45.42
Pigeon pea	15.92	21.40	34.42	2.96	3.80	28.37
Maize	16.44	14.11	-14.17	4.28	7.47	74.53
Kodo	7.22	17.55	143.07	2.67	3.74	40.07
Kutki	6.95	12	72.66	21.80	5	-77.06
Sugarcane	371.50	500	34.58	-	-	-
Niger	-	-	-	2.23	3.73	67.26
<i>Rabi</i>						
Wheat	14.59	21.29	45.92	5.12	8.31	62.30
Gram	11.96	14.88	24.41	2.98	4.41	47.98
Paddy	00	15	“	-	-	-
Lentil	6.33	00	-100	2.83	2.67	-5.65
Sugarcane	333.33	00	-100	-	-	-

**Table 4: Impact of ATMA programme on crop production (q hectare<sup>-1</sup>)**

Crops	Mandla (n=150)		% change	Dindori (n=150)		% change
	2010-11	2016-17		2010-11	2016-17	
<i>Kharif</i>						
Paddy	5556	21,215	281.83	1768.75	3241	83.23
Pigeon pea	157	577	267.51	90.52	81	-10.51
Maize	158	24	-84.81	75	179.50	139.33
Kodo	135	79	-41.48	152	91	-40.13
Kutki	40	36	-10	82	55	-32.92
Sugarcane	4250	1500	-64.70	-	-	-
Niger	-	-	-	141	157.70	11.84
<i>Rabi</i>						
Wheat	1721	2812	63.39	587.80	951	61.78
Gram	677	962	42.09	636.50	1018.50	60.01
Paddy	00	45	-	-	-	-
Lentil	19	00	-100	73.10	127.50	74.41
Sugarcane	1500	00	-100	-	-	-

**Table 5: Distribution of the respondents according to their marketing of agriculture produce**

Marketing of agriculture produce	Mandla (n=150)				Dindori (n=150)			
	2010-11		2016-17		2010-11		2016-17	
	f	%	f	%	f	%	f	%
Merchant	53	35.33	2	1.33	41	27.33	2	1.33
Local shopkeepers	26	17.34	7	4.67	35	23.34	7	4.67
Mandi	53	35.33	27	18.00	43	28.67	45	30.00
Cooperative society	9	6.00	110	73.34	6	4.00	90	60.00
Unsure	9	6.00	3	2.00	25	16.66	6	4.00
Others	0	0.00	1	0.66	0	0.00	0	0.00

Note: F- Frequency

of the total cropped area, 84.71 per cent area of respondents of Mandla district and 76.14 per cent area of Dindori respondents were found under rice crop. In addition to rice, 10.05, 0.63, 1.67, 1.11, and 1.11 per cent cropped area of Mandla district respondents was found under pigeon pea, maize, kodo, kutki and sugarcane crops, respectively and remaining 0.74 per cent cropped area was found under other crops like vegetable etc. Similarly, in case of Dindori district farmers 4.13, 4.66, 4.72, 2.13 and 8.20 per cent cropped area was found under pigeon pea, maize, kodo, kutki and niger crops, respectively and none area was found under other crops.

In rabi season, (Table 1) indicates that wheat and gram was found as the most important crop cultivated on about 64.65 and 56.64 per cent cropped area of Mandla and Dindori respondents, respectively. Out of the total cropped area in rabi season, 31.54, 1.46 per cent cropped area of respondents of Mandla were found under gram and paddy crops, respectively and remaining 2.53 per cent cropped area was found under other crops like vegetables. In case of Dindori respondents 28.09 per cent cropped area was found under wheat crops followed by 11.69 per cent cropped area was paddy, 3.56 per cent cropped area was found under other crop. The total rabi area of Mandla farmers was far behind than the rabi area of farmers of Dindori may be due to non-availability of irrigation.

The data given in table-2 indicates that in kharif season all the respondents were growing rice crop. After initiating the ATMA programme in selected villages the total cropped area is increased in both kind of respondents Mandla (0.63%) and Dindori (0.98%) over the 2010-11 to 2016-17. The major crops area of respondents of Mandla were subsequently increased in pigeon pea crop 173.42 per cent, followed by paddy 11.34 per cent area were increased and maize (-82.31%), followed by kodo (-75.42%), other crops (-73.78%), sugarcane (-73.77%), and kutki (-47.82%) were slightly decreased. Whereas, in case of Dindori district others maize were increased 37.14 per cent, followed by paddy (25.97%) and kutki (-64.24%), followed by kodo (-57.26%), niger (-32.93%) and pigeon pea (-30.29%) were slightly decreased crop area over the 2010-11 to 2016-17. As for rabi season, the total cropped area is increased in both the districts respondents Dindori (11.67%) as compared to Mandla (10.94%) over the 2010-11 to 2016-17. The other crop area is slightly increased in Mandla district 92.59 per cent, followed by gram area (14.28%), wheat (11.98%), lentil and sugarcane is (-100%) decreased. Whereas, in case of Dindori district lentil area is slightly increased 84.93 per cent, followed by other crops area (31.81%), gram (8.23%), and wheat is (-0.30%) slightly decreased over the 2010-11 to 2016-17.

### ***Impact of ATMA programme on crop productivity (q hectare<sup>-1</sup>)***

The productivity of crops is given in table- 3. After ATMA programme launched at selected area it has been observed that productivity of the crop is also increased i.e. paddy 243.02 per cent, followed by kodo (143.07%), kutki (72.66%), sugarcane (34.58%), and pigeon pea 34.42 per cent. Only maize was observed that productivity of crop is (-14.17%) slightly decreased. Same way it was observed that Dindori farmers productivity of the crop is adequately increased i.e. maize 74.53 per cent, followed by paddy (45.42%), kodo (40.07%) and pigeon pea 28.37 per cent increased in kharif season only kutki (-77.06%) has been observed that productivity of crop is slightly decreased. In rabi season wheat crop productivity is substantially increased in respondents of Mandla district 45.92 per cent, followed by gram 24.41 per cent productivity increased and lentil and sugarcane is (-100%) productivity decreased. In case of Dindori respondents wheat crop productivity is increased 62.30 per cent followed by gram crop productivity is 47.98 per cent increased and only lentil (-5.65%) has been observed that productivity of crop is slightly decreased over the 2010-11 to 2016-17. This indicated that productivity was increased by the adoption of hybrid rice varieties through ATMA programme. It appears that there is positive impact of ATMA on productivity of various crops. It is evident from the result that there is positive and good impact found in respondents in terms of increasing the area and increasing the productivity. The reason might be through ATMA programme give the training, demonstration and visit about various improved agronomic practices and new technology to the farmers for enhancing the crop production and productivity.

The production of crops is given in table- 4. After ATMA programme launched at selected area it has been observed that production of the crop is also increased i.e. paddy 281.83 per cent, followed by pigeon pea 267.51 per cent and maize (-84.81%), kodo (-41.48%), sugarcane (-64.70%) and kutki (-10%) were observed that production of crop is slightly decreased. Same way it was observed that Dindori farmers production of the crop is adequately increased i.e. maize 139.33 per cent, followed by paddy (83.23%), and niger 11.84 per cent increased in kharif season, kodo (-40.13%), kutki (-32.92%) and pigeon pea (-10.51%) has been observed that production of crop is slightly decreased. In rabi season wheat crop production is substantially increased in respondents of Mandla district 63.39 per cent, followed by gram 42.09 per cent production increased and lentil and sugarcane is (-100%) production decreased. In case of Dindori respondents lentil crop

production is increased 74.41 per cent followed by wheat crop production is 61.78 per cent and gram crop production is 60.01 per cent increased over the 2010-11 to 2016-17.

Distributions of the respondents according to their marketing of agriculture produces were presented in the table- 5. Before the ATMA programme was launched at the study area is 2010-11, the maximum of respondents of Mandla district (35.33%) were sold their agricultural produce to merchant and mandi, followed by local shopkeepers (17.34%), co operative society (6%) and 6 per cent un sure. After initiating the ATMA programme in 2016-17 sold their agriculture produce by the respondents of the Mandla to the co-operative society i.e. 73.34 per cent, followed by 18.00 per cent mandi, 6.67 per cent local shopkeepers, 2.00 per cent un sure, 1.33 per cent merchant, only 0.66 per cent were sold their agricultural produce in other.

In case of Dindori district respondents regarding marketing of agricultural produce the maximum of respondents (28.66%) sold to mandi, followed by 27.33 per cent merchant, 23.33 per cent local shopkeepers, 16.66 per cent were unsure and 4 per cent co operative society for marketing of agricultural produces in 2010-11. The majority of 60 per cent respondents were sold their agriculture produce in co-operative society, followed by 30.00 per cent mandi, 4.66 per cent local shopkeepers, 4 per cent unsure, 1.33 per cent in merchant for marketing of agricultural produces in the present year 2016-17.

It can be inferred that before ATMA programme respondents were sold of agricultural produce to merchant, and mandi and after ATMA programme selling of agricultural produce in co-operative society. Some respondents were selling of agricultural produce in others like local market etc. It appears that ATMA programme has considerable impact in the knowledge of market linkage of the respondents, which ascertain the good selling of cost of the ATMA respondents.

From the above research findings it can be concluded that after initiating the ATMA programme in selected districts the total cropped area is increased in both kind of respondents. This indicated that productivity was increased by the adoption of hybrid rice varieties through

ATMA programme. It appears that there is positive impact of ATMA on productivity of various crops. It is evident from the result that there is positive and good impact found in ATMA respondents in terms of increasing the area and increasing the productivity and production of crop. The reason might be through ATMA programme give the training, demonstration and visit about various improved agronomic practices and new technology to the farmers for enhancing the crop production and productivity.

## REFERENCES

- Ali, L. 2001. A study on the changes in cropping pattern income and employment status among beneficiaries of national watershed development project of Panagar block of Jabalpur district (M.P.). *M.Sc. (Ag.) Thesis*, JNKVV, Jabalpur, pp. 106.
- Anderson, J. R. 2007. Background paper for the *World Development Report 2008: Agricultural advisory services*. Washington D C. Agriculture and Rural Development Department, World Bank.
- Choudhary, V. 2010. Study on impact of watershed development programme on productivity of major crops grown by the beneficiaries of Katangi block of Balaghat District (M.P.). *M.Sc. (Ag.) Thesis*, JNKVV, Jabalpur.
- MANAGE (National Institute for Agricultural Extension Management). 2010. State agricultural management and extension training institute. Rajendranagar, India: India Ministry of Agriculture, MANAGE. <http://www.manage.gov.in/NATP/sameti.htm>. Accessed on August 10, 2010.
- Sahu, B. P. 2011. Impact of agricultural technology management agency (ATMA) on socio-economic status of tribal farmers in Surguja district of Chhattisgarh. *M.Sc. (Ag.) Thesis* (unpublished), IGKVV, Raipur.
- Soni, S. N., Sharma, H. O. and Malviya, P. K. 2003. Adoption of recommended rainfed agriculture technology. A case study of Perunala Watershed development project of M.P. *Madhya J. Extn. Edu.*, 6:66-71.
- Singh JP. 2000. Economic evaluation of Manchal Watershed National Institute of Agriculture Extension management, Rajendranagar, Hyderabad-30.