



Research Article

## Impact of agricultural technology management agency (ATMA) on socio-economic status of tribal farmers

■ BHEDU PRASAD SAHU, M.K. CHATURVEDI AND KEDAR NATH YADAW

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**SUMMARY :** The present study was carried out during 2011 in the Surguja district of Chhattisgarh state. This study was conducted in randomly selected 10 villages of three purposively selected blocks *i.e.* Ambikapur, Lundra, Surajpur located in Surguja district. The aim of this study was to know the impact of ATMA on socio-economic status of the respondents. A total of 150 respondents (100 beneficiary and 50 non-beneficiary 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 reveal that the mechanical power, annual income, number of livestock, pucca house, home related items and possession of other assets were found slightly bit higher among beneficiaries as compared to non-beneficiaries.

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**KEY WORDS :**

ATMA, Socio-economic status, Tribal farmers, Surguja, Chhattisgarh

### BACKGROUND AND OBJECTIVES

Extension is presently an object of reform, while continuing to be an increasingly important engine for knowledge, innovation and development (Rivera and Sulaiman, 2009). Extension is often viewed as comprising public, private and semi-public systems that make up a multi-institutional, multi-sectoral pluralistic system. Also, views on extension have changed in emphasis from agricultural production to helping farmers organize themselves, and most recently to the linking of farmers to markets (Swanson, 2006; Shepherd, 2007). The challenges posed by agricultural globalization revolution in information and communication technology rising population and the consequent demand for sustainability have prompted to have a re-look on the existing extension system in India and re-orient it with proper direction. In November 1998, Govt. of India initiated a project called national agriculture technology project (NATP) with the financial assistance from World Bank. The concept of ATMA was introduced in 1999 as an autonomous organization under the national

agricultural technology project (NATP) by providing flexible working environment. The concept of ATMA envisages paradigm shift from “top down” to “bottom up” in planning and implementation of agriculture development programmes. ATMA is a decentralized and demand driven extension mechanism operating on the comparative strength of different stakeholders. It is a registered society responsible for technology dissemination at the district level through SREP (Strategic Research and Extension Plan). It can receive fund directly from GOI/States, membership fees, beneficiaries’ contribution etc.

The institutional mechanism in the form of agricultural technology management agency (ATMA) at district level was pilot tested under innovations in technology dissemination (ITD) component of World Bank funded national agriculture technology project (NATP) with effect from November, 1998 to 2004 in seven states *viz.*, Andhra Pradesh, Bihar, Himachal Pradesh, Jharkhand, Maharashtra, Orissa and Punjab covering 4 districts in each state. This successful experiment served as a basis to launch the scheme, ‘support to state extension programmes for

Author for correspondence :

**BHEDU PRASAD SAHU**

Department of  
Agricultural Extension,  
Indira Gandhi Krishi  
Vishwavidyalaya, RAIPUR  
(C.G.) INDIA  
Email: bhedusahu52@  
gmail.com

See end of the article for  
authors’ affiliations

extension reforms," in its first phase since 2005-06. The scheme was later up-scaled to 252 districts including 5 districts of Chhattisgarh during the X<sup>th</sup> Plan period. This scheme has been implemented through ATMA programme. Prakash and De (2008) reported that due to technological interventions through ATMA, majority of respondents had medium knowledge about bee-keeping and a significant association between knowledge and independent variables *viz.*, age, education, family type, family size and sources of information utilized was observed.

Keeping in view of the above facts in to consideration, the present study was undertaken to assess the impact of ATMA on the socio-economic status of the beneficiaries.

## RESOURCES AND METHODS

This study was conducted in Surguja district of Chhattisgarh, during the year 2011. During the survey Chhattisgarh state had 18 districts out of which Surguja district was selected purposively because this district has got highest fund for the ATMA programme. From this district only three blocks *i.e.*, Ambikapur, Lundra and Surajpur were selected purposively. From each selected block out of total villages, only 14 villages in Ambikapur, 12 villages in Lundra and 15 villages in Surajpur block have been selected by Government of Chhattisgarh for carrying out the various activities under ATMA programme. Out of these beneficiary villages, only 25 per cent villages in each block *i.e.* Rakeli, Darima, Nawanagar (Ambikapur), Lamgaon, Kot, Dorna (Lundra), Ajirama, Kalyanpur, Dwrikanagar and Jagatpur (Surajpur) were

randomly selected (Total 10 villages) for the study. From each 'farmers interest groups' 10 tribal farmers were randomly selected those were beneficiaries of ATMA programme from each selected village as respondent. In this way, 30 farmers from Ambikapur, 30 farmers from Lundra and 40 farmers from Surajpur (30+30+40=100 beneficiary farmers) were selected to determine the impact of ATMA programme on socio-economic status of the farmers. The 5 non-beneficiary farmers were also selected from same village as non-beneficiary respondents (15+15+20=50). Thus, total of 150 (100 beneficiaries and 50 non-beneficiaries) farmers were selected as respondents for the present study. 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. Collected data were analyzed by the help of various statistical tools *i.e.* frequency, percentage, mean and standard deviation, etc.

## OBSERVATIONS AND ANALYSIS

The results of the present study as well as relevant discussion have been summarized under following heads:

### Impact of ATMA programme on various components:

*Impact of ATMA programme on livestock and farm machinery:*

Table 1 manifested the percentage of changes on various components of the respondents after being under programme

**Table 1 : Impact of ATMA on various selected components of the respondents**

Particulars	Beneficiary		% change	Non-beneficiary		% change
	2004-05	2010-11		2004-05	2010-11	
<b>Livestock (in numbers)</b>						
Cow	172	179	4.07	88	89	1.13
Bullock	146	163	11.64	74	87	9.45
Buffalo	9	14	55.56	21	3	-85.71
Male buffalo	16	38	137.50	12	14	16.66
Goat	22	48	118.18	14	27	92.85
Cock	13	20	53.84	3	3	0
Over all	378	462	22.23	212	223	5.18
<b>Farm machinery assets (in numbers)</b>						
Local plough	84	95	13.09	51	53	3.92
Disk harrow	1	1	0	0	1	-
Sprayer	42	75	78.75	16	26	62.5
Duster	0	0	0	1	1	0
Thresher	0	4	-	2	3	50.00
Tractor	1	3	200.00	2	4	100.00
Diesel pump	4	9	125.00	2	4	100.00
Others	34	60	76.47	15	24	60.00
Over all	166	247	48.79	89	116	30.33

last five years. The possession of livestock was increased remarkably in both beneficiaries and non-beneficiaries. Possession of livestock was 22.23 per cent changes in ATMA beneficiaries and only 5.18 per cent changes observed in non-beneficiaries. Number of buffalos was increased 55.56 per cent in case of beneficiaries as compared to non-beneficiaries decreased -85.71 per cent. Goat (118.18%), male buffalo (137.50%) and cock (53.84%) was tremendous change observed in beneficiary group, but non-beneficiaries had least change observed.

Farm machinery assets were also increased due to passes of time in both the categories. In general, 48.79 per cent changed observed in ATMA beneficiaries as compared to non-beneficiaries 30.33 per cent changes. Remarkable changes were observed in possession of tractor, diesel pump, sprayer and other i.e. power tiller, sprinkler, winnowing fan etc.

*Impact of ATMA programme on domestic items and others:*

Table 2 indicates that house type was slightly decreased in ATMA beneficiaries and non-beneficiaries. There were no

changes observed in pucca (Khprail) in non-beneficiary respondents as compared to ATMA beneficiaries decrease in Kutcha dwellers thereby increasing pucca (Cement) dwellers.

Home material items were also increased in both the categories. In case of beneficiaries 725.00 per cent changes in electric pump as compared to 183.33 per cent change observed in non-beneficiaries. Remarkable impact was observed in motor cycle in beneficiaries (660.00%) and non-beneficiaries (600%). The tremendous change observed in construction of toilet facility 1675.00 per cent observed in ATMA beneficiaries as compared to non-beneficiaries 1100.00 per cent. The reasons might be Govt. provided subsidy for making toilet.

There was a tremendous change observed in possession of other assets in case of ATMA beneficiaries i.e. chair, fan, cupboard, cooler, freeze, mobile, cooking gas as compared to non-beneficiaries. Radio and telephone was decreased in both the categories thereby increasing in other assets i.e. T.V., mobile, C.D./D.V.D. etc.

**Table 2: Impact of ATMA on various selected components of the respondents**

Particulars	Beneficiary		% change	Non-beneficiary		% change
	2004-05	2010-11		2004-05	2010-11	
<b>House type</b>						
Hut	0	0	0	0	0	0
Kutcha	80	75	-6.25	40	39	-2.50
Pucca (Khprail)	20	19	-5.00	10	10	0
Pucca (Cement)	0	6	-	0	1	-
<b>Home related items</b>						
Cycle	80	104	30.00	43	53	23.25
Bullock cart	1	0	-100.00	0	0	0
Electric pump	4	33	725.00	6	17	183.33
Motor cycle	5	38	660.00	2	14	600.00
Toilet	4	71	1675.00	3	36	1100.00
<b>Possession of other assets</b>						
Chair	123	308	150.40	71	162	128.16
Table	38	74	94.73	21	36	71.42
Fan	15	135	800.00	14	56	300.00
Radio	45	16	-64.44	14	5	-64.28
Electric iron	9	36	300.00	5	13	160.00
C.D./D.V.D.	0	18	-	0	7	-
Cup board	5	27	440.00	5	13	160.00
Stitch machine	4	9	125.00	1	3	200.00
Cooler	0	11	-	2	4	100.00
T.V.	39	79	102.56	15	36	140.00
Freeze	0	3	-	0	1	-
Cooking gas	0	6	-	1	3	200.00
Telephone	0	0	0	1	0	-100.00
Mobile	0	88	-	0	46	-

**Table 3 : Impact of ATMA on average annual income of the respondents (income in Rs.)**

Particulars	Beneficiary		% change	Non-beneficiary		% change
	2004-05	2010-11		2004-05	2010-11	
Agriculture	1702400	3055000	79.45	875500	1530000	74.75
Animal husbandry	15000	29400	96.00	17000	14300	-12.35
Labour	167000	337700	102.21	60200	128100	112.79
Horticulture	257600	496200	92.62	72000	120000	66.66
Business	53000	103000	94.33	6000	8000	33.34
Others	5000	8000	60.00	22000	43000	95.45
Over all	2200000	4029300	83.15	1052700	1843400	75.11

*Impact of ATMA programme on average annual income of the respondents:*

The data regarding average annual income of the respondents are given in Table 3. Average annual income of beneficiaries was quite high as compared to non-beneficiaries. Animal husbandry income was decreased -12.35 per cent in non-beneficiaries as compared to 96.00 per cent increasing in beneficiaries. The major factors affecting increasing in income were animal husbandry, horticulture and business in addition to agriculture etc.

*Impact of ATMA programme on selected farmer interest groups (FIGs):*

The Table 4 reveals that the percentage changes on profit of the FIGs groups after being under ATMA programme last five years. It has been recorded from the data that there is sustainable change in the profit of various farmers interest

groups (FIGs) involved in ATMA programme. The table showed that the profits of the groups were increased after implementation of ATMA programme by farmer interest groups like FIGs, Lamgaon profit increased (44.32%) in cultivation of wheat followed by 38.23 per cent profit was increased in FIGs, Dorna in cultivation of vegetables, FIGs, Kot (34.93%) changes in cultivation of wheat.

Whereas, Mahamaya FIGs, Jagatpur (28.00%) in dairy farming, Shiv FIGs, Navanagar (22.91%) in cultivation of sugarcane, Mahamaya FIGs, Darima (22.72%) in vermi compost, Deepak FIGs, Ajirma (16.67%) in made tricoedema, Utakal FIGs, Kalyanpur (13.75%) in rice cultivation, FIGs, Dawrikanagar (11.53%) in sugarcane cultivation and 8.89 per cent profit increased in goat rearing in Milan FIGs, Rakeli. By analysis the data it has been concluded that increase in income of ATMA beneficiaries FIGs groups which economical support than strongly for their good livelihood.

**Table 4 : Impact of ATMA programme on selected farmer interest groups (FIGs) in terms of financial gain**

Types of groups	Group members	2004-05 income (In Rs.)	2010-11 income (In Rs.)	Increase in income	% change in 2010-11 over 2004-05
Wheat production					
FIGs, Lamgaon	15	97000	140000	43000	44.32
FIGs, Kot	10	83000	112000	29000	34.93
Sugarcane production					
Shiv FIGs, Navanagar	15	48000	59000	11000	22.91
FIGs, Dawrikanagar	40	130000	145000	15000	11.53
Rice production					
Mahamaya FIGs, Darima	21	22000	27000	5000	22.72
Utakal FIGs, Kalyanpur	26	80000	91000	11000	13.75
Vegetable production					
FIGs, Dorna	16	34000	47000	13000	38.23
Tricoedema production					
Deepak FIGs, Ajirma	10	12000	14000	2000	16.67
Milk production					
Mahamaya FIGs, Jagatpur	15	37500	48000	10500	28.00
Goat rearing					
Milan FIGs, Rakeli	14	76860	83700	6840	8.89

**Table 5 : Distribution of the respondents according to their level of socio-economic status**

Level of socio-economic status	Beneficiary (n=100)		Non-beneficiary (n=50)	
	Frequency	Percentage	Frequency	Percentage
Low (<40)	21	21	22	44
Medium (41-80)	65	65	24	48
High (81-120)	14	14	4	8

**Table 6 : Difference between beneficiary and non-beneficiary respondents with respect to their selected socio-economic characteristics**

Particulars	Beneficiary	Non-beneficiary
Frequency	100	50
Mean	62.33	57.16
S.D.	14.62	11.97
'Z' value	2.31*	

**Table 7 : Correlation analysis of independent variables with the socio-economic status of the respondents**

Sr. No.	Independent variables	Correlation coefficient (r)	
		Beneficiary	Non-beneficiary
1.	Age	0.0373	0.0888
2.	Education	0.1171	0.6099**
3.	Type of family	0.1683	0.0371
4.	Family size	0.1729	-0.0146
5.	Social participation	0.0248	0.3979**
6.	Occupation	0.1987*	0.4194**
7.	Land holding	0.4286**	0.5728**
8.	Annual income	0.6113**	0.5900**
9.	Credit acquisition	0.2937**	0.5677**
10.	Sources of information	0.5271**	0.7622**
11.	Contact with extension personnel	0.3303**	0.4750**
12.	Risk orientation	0.3693**	0.1706
13.	Knowledge level	0.4113**	0.2288

\* and \*\* indicate significance of values at P=0.05 and 0.01, respectively

### Socio-economic status of the respondents:

The socio-economic status of the beneficiaries and non-beneficiaries are given in Table 5. The data reveal that the majority of the ATMA beneficiaries (65%) were found to have medium socio-economic status followed by 21 per cent of the beneficiaries were categories low socio-economic status and only 14 per cent beneficiaries were found to have high socio-economic status. Whereas, the majority 48 per cent of the non-beneficiaries were found to be medium socio-economic status, followed by 44 per cent non-beneficiaries were categorized low socio-economic status and 8 per cent of the non-beneficiaries were found to have high socio-economic status.

### Impact of ATMA programme on socio-economic status of the respondents:

To determine the level of difference between the beneficiary and non-beneficiary respondents related to their

socio-economic status, 'Z' test was applied and results are summarized in Table 6. It reveals that beneficiary farmers had the significantly higher socio-economic status as compared to non-beneficiary farmers because the 'Z' value was found significant. This indicated that ATMA programme played important role in increasing the socio-economic status of the farmers may be due to increased income.

### Correlation co-efficient analysis of independent variables with socio-economic status of the respondent:

To determine the relationship of selected independent variables with the socio-economic status of the respondents, the correlation analysis was worked out and results are present in Table 7. The finding revealed that out of 13 independent variables only 8 variables *i.e.* occupation were found to be positive and significantly correlated at 0.05 level of probability and land holdings, annual income, credit acquisition, sources of information, contact with extension personnel, risk

**Table 8 : Multiple regression analysis of the independent variables with the socio-economic status of the respondents**

Sr. No.	Independent variables	Partial regression coefficient			
		Beneficiary		Non-beneficiary	
		'b' value	't' value	'b' value	't' value
1.	Age	-0.1479	0.9596	-0.0395	-0.1578
2.	Education	-0.0217	-0.0424	5.7753	1.9019
3.	Type of family	5.3154	0.8880	2.7900	0.3596
4.	Family size	0.6946	0.6176	-3.7879*	-2.5941
5.	Social participation	2.9352*	1.9918	1.7855	0.7912
6.	Occupation	0.2249	0.1351	1.9292	0.6899
7.	Land holding	2.5229*	2.0206	1.5210*	2.3184
8.	Annual income	2.3006**	5.3552	1.2003*	2.4149
9.	Credit acquisition	1.4542	0.4397	7.8776	1.5444
10.	Sources of information	2.2554**	3.3425	2.5149*	2.7025
11.	Contact with extension personnel	5.1065*	2.3252	-0.1683	-0.0433
12.	Risk orientation	0.6705	0.7746	0.9642	0.6444
13.	Knowledge level	0.1018	0.3011	0.1132	0.1232
* and ** significance of values at P=0.05 and 0.01, respectively		Multiple R <sup>2</sup>	0.6113	0.8238	
		Intercept constant (a)	16.40	15.87	
		F value	9.245 (at 13,99 d.f.)	11.690 (at 13,49 d.f.)	

orientation and knowledge level were found to be positive and highly significantly correlated at 0.01 level of probability with the socio-economic status of the ATMA beneficiaries. The other variables like age, education, type of family, family size and social participation showed statistically non significant relationship with socio-economic status of the beneficiaries.

In case of non-beneficiary respondents out of 13 independent variables only 9 variables *i.e.* education, social participation, occupation, land holdings, annual income, credit acquisition, sources of information and contact with extension personnel were found to be positive and highly significantly correlated at 0.01 level of probability with the socio-economic status. However, remaining 5 independent variables *i.e.* age, type of family, family size, risk orientation and knowledge level could not indicated any significant relationship with the socio-economic status of the respondents.

It clearly indicated that, if the land holding, annual income, credit acquisition sources of information and contact with extension personnel increases that will be definitely increases the socio-economic status of the beneficiary and non-beneficiary farmers. This study is strongly supported from the findings of Shrivastava (1999) and Rao (2001).

#### **Multiple regression analysis of independent variables with socio-economic status of the respondent:**

The result of multiple regression analysis is presented in Table 8 the result of multiple regression analysis reveals that, out of 13 independent variables, the two variables *viz.* annual income and source of information contributed positively and highly significantly toward socio-economic status at 0.01 per

cent level of probability in ATMA beneficiaries. The three variables social participation, land holding and contact with extension personnel contributed positively and significantly at 0.05 per cent level of probability toward socio-economic status of the beneficiaries. The other variables age, education, type of family, family size, occupation, credit acquisition, risk orientation and knowledge level about ATMA had no significant contribution in socio-economic status of the beneficiary respondents.

In case of non-beneficiary farmers, out of 13 variables, land holding, annual income and sources of information showed the positive and significant contribution at 0.05 per cent level of probability and family size showed the negative and significant contribution at 0.05 per cent level of probability in socio-economic status. Remaining 9 variables age, education, type of family, social participation, occupation, credit acquisition, contact with extension personnel, risk orientation and knowledge level had no significant contribution in socio-economic status of the non-beneficiary respondents.

All the selected 13 variables which were fitted in regression model explained the 61.13 and 82.38 per cent of the total contribution were explained in the socio-economic status of beneficiary and non-beneficiary respondents, respectively. The corresponding F value was found significant with 13, 99 d.f. and 13, 49 d.f.

It indicated that, increase in social participation, land holding, annual income, sources of information and contact with extension personnel led to increase the socio-economic status of the beneficiary farmers. Similarly, land holding, annual income and sources of information of non-beneficiary farmers

is to be increased for enhance their exiting socio-economic status. Rao (2001) noted almost similar findings in his study.

**Conclusion:**

From the above research findings it can be concluded that the mechanical power, animal husbandry, house type, home related items, possession of other assets and annual income were more in case of ATMA beneficiaries as compared to non-beneficiaries. Majority of the beneficiaries acquired positively higher level of productivity as compared to non-beneficiaries which shows the positive impact of ATMA on socio-economical aspects of ATMA beneficiaries. Majority of the ATMA beneficiaries (65%) were found to have medium socio-economic status.

Authors' affiliations :

**M.K. CHATURVEDI AND KEDAR NATH YADAW**, Department of Agricultural Extension, Indira Gandhi Krishi Vishwavidyalaya, RAIPUR (C.G.) INDIA

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