Impact of Agricultural Technology Management Agency (ATMA) on production and productivity of paddy and wheat crops among different categories of farmers under Gwalior district in Madhya Pradesh

THESIS

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Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya

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In

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By

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2021

CERTIFICATE- I

This is to certify that the thesis entitled ***"Impact of Agricultural Technology Management Agency (ATMA) on production and productivity of paddy and wheat crops among different categories of farmers under Gwalior district of Madhya Pradesh"*** *submitted in partial fulfillment of the requirement for the degree of* ***MASTER OF SCIENCE IN AGRICULTURE (Department of Agricultural Extension and Communication)*** *of the RVSKVV Gwalior is a record of the bonafide research work carried out by* ***Mr. Rahul Singh Tomar*** *under my guidance and supervision. The subject of the thesis has been approved by the student's Advisory Committee and the Director of Instruction.*

All the assistance and help received during the course of the investigation has been acknowledged by him.

Place: Gwalior

Date:

Dr. H.P Singh
Chairman of the Advisory Committee

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CERTIFICATE- II

This is to certify that the thesis entitled ***"Impact of Agricultural Technology Management Agency (ATMA) on production and productivity of paddy and wheat crops among different categories of farmers under Gwalior district of Madhya Pradesh"*** *submitted by* ***Mr. Rahul Singh Tomar*** *to the Rajmata Vijayeraje Scindia Krishi Vishwa Vidyalaya. Gwalior in partial fulfillment for the requirements of the degree of* ***Master of Science in Agriculture*** *(****Agricultural Extension and Communication****) in the Department of Extension Education has been, after evaluation. Approved by the External Examiner and by the Student's Advisory Committee after an oral examination on the same.*

Place: Gwalior

Date: Dr. H.P Singh

Chairman of the Advisory Committee

MEMBERS OF THE ADVISORY COMMITTEE

Chairman	Dr. H.P Singh	----------
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Dean of the College		----------
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DATE: / /2021
PLACE: GWALIOR ***(Rahul Singh Tomar)***

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Chapter-I

INTRODUCTION

The concept of ATMA was introduced In 1999 as an autonomous organization under the National Agricultural Technology Project (NATP) by providing flexible working environment with an objective of Integrating research, extension and all other stake holders at the district level to support the farmer's floods and Interest through on integrated approach of strategic plan. ATMA is a society of key stake holders involved in agricultural activities for sustainable agricultural development in the district. The activities of ATMA are decided and executed by a Governing Board (GB) and Management Committee (MC) of ATMA at district level constituted by the State Govt. The extension activities under this scheme prepared by a team of technical officers called Block Technology Team (BIT) at block level and are vetted and prioritized by an exclusive team of farmers called Farmers Advisory Committee (FAC) at block level. For effective implementation of ATMA activities at village level. Farmers Interest Groups (FIGs) and Farmers organizations are being developed by ATMA operating agencies at village level.

The concept of ATMA envisages paradigm shift from 'top down' to "bottom up' in planning and implementation of agriculture development programmes. The key functions of ATMA programme are decentralized decision making at the district level by way of developing Strategic Research and Extension Plan (SREP) and its implementation, involvement of all stakeholders in the development process and identification of problems, opportunities, preferences and priorities of farming community. The strategic plan covers the diversification of farming systems, intensification of existing farming system and improvement of productivity and income etc. It can receive fund directly from GOI/ States, membership fees, beneficiary’s contribution etc.

It is going to be increasingly responsible for all the technology dissemination activities at the district level. It would have linkage with all the line departments, research organizations, non-governmental organizations and other agencies associated with agricultural development in the district. Research and Extension units within the project, districts such as IRS or substations, KVKs and

the key line Departments of Agriculture, Animal Husbandry, Horticulture and Fisheries etc. would become constituent members of ATMA.

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 Agricultural 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.

Cafeteria Activities of ATMA:

1. Training and exposure visits of extension functionaries and farmers – Inter State, Intra State and Intra District.
2. Demonstrations (Agricultural & Allied sectors) – farmer-to-farmer technology dissemination.
3. Farm Schools at GP/ Block Level.
4. Farmers Awards (State, District & Block Level).
5. Kisan Melas/ Exhibitions/ Interactions at State, District and Block Level.
6. Innovative Activities.

Aims and Objectives of ATMA:

1. To identify location specific needs of farming community for farming system based agricultural development.
2. To set up priorities for sustainable agricultural development with Farming Systems Approach.
3. To draw plans for production based system activities to be undertaken by farmers/ultimate users.
4. To execute plans through line departments, training institutions, NGOs, farmers organizations and allied institutions.
5. To coordinate efforts being made by various line departments. NG0s. farmer's organizations and allied institutions to strengthen research extension-farmers linkages in the district and to promote collaboration and coordination between various states funded technical departments.

6. To facilitate the empowerment of farmers/producers through assistance for mobilization, organization into associations, cooperatives etc. for their increased participation in planning, marketing, technology dissemination and agro-processing etc.
7. To facilitate market Interventions for value addition to farm produce.

Hence, keeping in view the above facts, the present investigation entitled **"Impact of Agricultural Technology Management Agency (ATMA) on Production of Paddy and Wheat crops among different categories of farmers under Gwalior district in Madhya Pradesh"** was under taken with following objectives:-

Objectives of the study:

1. To study the profile of different categories of ATMA beneficiaries.

2. To determine the level of knowledge and participation of beneficiaries in different activities before and after ATMA.

3. To know the impact to ATMA in terms of increase in production of important paddy and wheat crops among the selected respondents.

4. To determine the relationship between dependent and independent variables.

5. To identify the constrains and suggestion of the respondents in participation of ATMA activities.

Limitation of the study:-

1. The present study faced the limitations of the time and the resources to be encountered by the researcher.
2. The items included in the study for detailed investigation are also limited because it is not possible to cover all the segments in such a short time.
3. Although every efforts were made to make the best use of standardized tools and techniques of data collection, yet their accuracy may not guaranteed.
4. As present study is based upon the expressed opinions of the respondents and individual attitude, which was perceived by them, hence

biasness might have occurred as it happens in most of the cases in such type of field study.

5. Although all possible precaution were taken to make the study precise, objective and reliable and as the present study was restricted to vicinity of Gwalior district. Therefore, the trend of finding might not give true picture of those areas, which has not resembled the present setting of locations.
6. For the purpose of calculating correlation the score '0' was converted into 0.001.

Scope of the study:-

The findings of this study would help to understand the impact of agricultural technology management agency on the production and productivity of major crops of different categories of farmers in Gwalior (M.P.).

The present study will provide useful guidance for understanding of various programmes under ATMA. The findings of the study would also be helpful to understand the problems faced by the farmers in participation of different ATMA activities and to obtain the suggestions to overcome the problems faced by them.

Chapter-II

REVIEW OF LITERATURE

This chapter presents the findings of the past research workers related to the present problem by going through the professional research journals, articles, documents, approved thesis, books and magazines in order to keep up-to-date information which are presented in following sub heads:

1. To study the profile of different categories of ATMA beneficiaries.
2. To determine the level of knowledge and participation of beneficiaries in different activities before and after ATMA.
3. To know the impact to ATMA in terms of increase in production of important paddy and wheat crops among the selected respondents.
4. To determine the relationship between dependent and independent variables.
5. To identify the constrains and suggestion of the respondents in participation of ATMA activities.

2.1. Profile of different categories of ATMA beneficiaries:

Age

Meshram (2003) reported that majority (51.67) of the beneficiaries were under the middle and above (above 35 years) category of age.

Mewara (2005) concluded that majority of beneficiaries' belonged to young and middle age group.

Dwivedi (2007) reported that majority of respondents belonged to middle age group.

Sharma (2009) observed that higher percentage of the SGSV beneficiaries belonged to middle age.

Ahirwar (2010) observed that majority of the (78.66) beneficiaries belonged to young and middle age group.

Dewagan (2019) indicated that over half of women (67.5%) belonged to middle-aged group, followed by 26.67% were young and the remaining 5.83% belonged to the elderly group. The result showed that by taking an active part in Self Help Groups (SHGs) the middle-age catogery played a major role in rising income.

Education

Meshram (2003) reported that majority (72.51%) of the SGSY beneficiaries were having primary to middle school education.

Mewara (2005) concluded that higher percentages (48.50%) of beneficiaries of watershed area were having education up to primary level.

Tiwari and Solanki (2007) found that educational status of the respondents reveals that more than hail of the SHG members and 62.50 per cent link workers could simply sign.

Sharma (2009) concluded that higher percentage of the SGSY beneficiaries were primary education.

Singh *et al.* (2009) concluded that maximum number of respondents (25.0%) were educated up to primary level followed by 24 per cent having junior high school level of education, 23 per cent were Intermediate and 18 per cent were high school level education.

Machhar *et al*. (2015) concluded that majority of the respondents (45.33%) were educated up to primary level.

Family size

Meshram (2003) reported that in rural- areas majority of SGSY beneficiaries (78.33%) had medium to large size of family.

Ajala et al. (2008) showed that 42.50 per cent of respondents were having fairly large family (6.10 person) followed by 30.80, 11.70, and 15.00 per cent respondents had small size (1-5 person), large size (11-15 person) and very large size (16-20 person) family, respectively.

Sharma (2009) found that majority (61.22%) SGSY beneficiaries had medium family size having 5 to 6 members.

Ahirwar (2010) concluded that majority (50%) SGSY beneficiaries had medium family size.

Type of family

Sharma *et al*. (2005) reported that majority of respondents (62.28%) belonged to nuclear type of family. Jyoti Sharma (2009) reported that majority of SGSY respondents belonged to nuclear family.

Ahirwar (2010) concluded that majority (75.84 %) of SGSY beneficiaries belonged to nuclear family system.

Gabhane (2014) found that majority of respondents having nuclear family.

Sharma (2017) revealed that in case of Mandla the maximum (54.66%) of the respondents belonged to nuclear family, followed by 45.34 per cent come under joint family. Whereas in Dindori the higher (60%) respondents belonged to joint family, followed by 40 per cent belonged to nuclear family. Thus, it may be concluded from the data that highest per cent of tribal farmers (52.66%) belonged to joint family.

Chander (2018) revealed that 58 (64.44%) beneficiary farmers and 52 (57.78%) non-beneficiary farmers belonged to nuclear family type further, 32 (35.56%) beneficiary farmers and 38 (42.22%) non-beneficiary farmers were found in joint family type.

Occupation

Mahoviya (2006) concluded that maximum respondents were having only farming as their main occupation.

Paigwar (2006) concluded that higher percentages (51.28%) of beneficiaries were observed in cultivation.

Sharma (2009) reported higher percentage of respondents were daily wages labourers.

Isah *et al*. (2010) reported that majority (42%) of the farmers have their major occupation as farming.

Annual Income

Patidar (2007) found that higher percentage (59.17) of respondents belonged to medium annual income group.

Bolarinwa and Fakoya (2011) revealed that 35.0 per cent of the beneficiaries of the farm credit scheme have income level of Rs. 21,000-50,000 compared to 10.4 per cent of non-beneficiaries in the same income level. Discrepancy in income level of beneficiaries and non-beneficiaries are reflected in farmer's productivity. That is the availability of credit is required for the purchase of needed innovations and agricultural inputs which are utilized to increase income.

Chinchmalatpure *et al*. (2011) reported that more than two third of the respondents (68.00%) fall under low to below poverty line group of annual income.

Jahagirdar *et al.* (2012) found that majority (41.00) of the respondents belonged to high annual income category.

Machhar *et al*. (2015) concluded that majority of the respondents (56.00%) were having low annual income.

Chandrakar (2020) reported regarding marketing channel of Leafy vegetables, most of the respondents (45.15%) had sold ‘producer to wholesalers marketing channel, 39.58 per cent respondents sold producers to consumer 12.50 had sold producer to broker and only 2.77 per cent of respondents sold through other.

Social participation

Meshram (2003) reported that majority i.e. 75.83 per cent had medium to high level of social participation.

Mewara (2005) concluded that maximum percentage of beneficiaries (67.62%) of watershed area were low in social participation.

Piagwar (2006) concluded that 50.42 per cent of the respondents were having low level of social participation.

Pawak (2009) concluded that the maximum number of beneficiaries belonged to medium social participation.

Machhar *et al*. (2015) concluded that majority of the respondents (64.00%) had no social participation.

Source of information

Gupta *et al*. (2003) indicated that electronic media, television and radio were mostly used and preferred for seeking Information on agriculture and development.

Deshmukh *et al*. (2007) observed that the majority of the respondents were utilizing the village leaders as source of information.

Ramesh and Santha (2008) found that higher information source utilization by the respondents would have helped them to accept the practices to higher level.

Badodiya *et al*. (2011) found that most of the beneficiaries' respondents (45.67%) belonged to medium category of information sources.

Scientific Orientation

Israel (2003) found that most of the beneficiaries had medium scientific orientation (67.50%).

Verma (2005) found that majority of the respondents (40.00%) had medium level of scientific orientation.

Kansana (2008) concluded that the higher percentage of watershed beneficiaries came under medium level of scientific orientation.

Maraddi *et al*. (2014) reported that nearly half of the respondent possessed lower level of scientific orientation (50.83%) followed by medium (36.67%) and high (12.50%) scientific orientation category.

Attitude towards ATMA

Kappala (2002) found that most of the farmers was having favorable attitude towards the programme (52%).

Adhikarl (2007) observed that a significant majority of the farmers had medium attitude towards improved practices of cultivation. Borban (2007) reported in their study of training needs as perceived by the farmers of Krishi Vigyan Kendra Betul district of Madhya Pradesh that the majority of the farmers had medium attitude towards improved agricultural technology category.

Mourya (2009) reported In his study on perception of tribal farmers viewing krishi Darshan Programme of Doordarshan with reference to Dima district that majority of the respondents were disagree category attitude towards contents of programme followed by perfectly disagree and agree respectively.

2.2 Level of knowledge and participation of different categories of beneficiaries in different activities before and after the ATMA project:

Level of Knowledge

Kappala (2002) found that most of the farmers had medium level of knowledge (67%).

Patel (2008) found that majority (74.00%) of the respondents had medium level of knowledge regarding recommended soybean production technology.

Prakash and De (2008) found that the maximum number of ATMA beneficiaries had medium (42.22%) level of knowledge followed by high level of knowledge (40%) and low level of knowledge (17.77%) about bee-keeping.

Pawak (2009) concluded that the higher percentages of watershed beneficiaries came under medium knowledge group.

Level of participation

Kappala (2002) found that most of the farmers had medium level of participation (57.50%). Israel (2003) found that most of the beneficiaries had low to medium level of participation (72.50%).

Paigwar (2006) concluded that higher percentage (42.73%) of beneficiaries had medium level of participation of watershed management practices.

Choudhary (2010) concluded that higher percentages (42.50%) were having medium level of participation about water shed management practices.

2.3 Impact of ATMA in terms of increase in production and productivity of important crops among the selected respondents:

Bain (2002) observed that the productive level of most of the crops have increased in watershed area. Besides this, the change was also seen in cropping Intensity of 26 per cent over a period from introduction of watershed project.

Paigwar (2006) concluded that owing to watershed development programme, the productivity levels of most of the crops have increased. It may be due to availability of irrigation water which was supplemented by technical inputs like WO/ seeds, fertilizer, plant protection measures etc.

Narain *et al*. (2014) found that the adoption scenario indicates that low gram productivity was the result of either poor knowledge or non-adoption or the combination of both. The productivity level also depends upon several independent variables associated with farmers adoption related to recommended gram technology.

2.4 Relationship between dependent and Independent variables:

Prakash and De (2008) concluded that age, education, family size and occupation were positively and significantly related with the knowledge level of ATMA beneficiaries about bee-keeping practices.

Gupta *et al*. (2010) concluded that occupation, size of family and annual income of respondents had a significant relation with the extent of participation.

Gupta *et al.* (2010) concluded that non-significant relationship of extent of participation was observed with size of farm holding.

Kaushal and Singh (2010) found that age was negatively correlated with political-legal empowerment.

Kaushal and Singh (2010) concluded that economic empowerment was found positively correlated with education and further reveals that political-legal empowerment had significant relationship with education.

Kaushal and Singh (2010) concluded that economic empowerment was found positively correlated with family occupation.

Kaushal and Singh (2010) concluded that economic empowerment was found positively correlated with annual income.

Kaushal and Singh (2010) concluded that political-legal empowerment had significant relationship with land holding.

Prakash *et al*. (2010) revealed that family size and age was positively and significantly related with the attitude of beneficiaries towards technology dissemination by ATMA.

2.5 Constraints and suggestion of the respondents regarding smooth watching of ATMA activities:

Constraints

Sharma *et al*. (2007) revealed that in the study area “lack of immediate returns in the programme was most serious problem as experienced by the farmers of watershed-1 whereas same was ranked 2nd by the farmers of watershed-2. The problem was logically true farmers” wants immediate return so that they could improve their economic conditions. On the basis of severity score, poor contact between farmers and officers and non-availability of appropriate literature was the 2nd and 3rd most serious problem but In case of watershed-2 these problems were ranked as 7th and 5th serious problems. In other form it could be inferred from the table that five most serious problems as experienced by farmers of watershed-1 were lack of immediate returns, poor contact between farmers and officers, non-availability of appropriate literature, lack of communication facilities and lack of proper marketing facilities. Whereas farmers of watershed-2 experienced poor education status of farmers, lack of immediate returns in the program, lack of proper marketing facilities, poor financial condition, transport problem and non-availability of appropriate literature.

Indrajeet and Kushawaha (2007) concluded that the new generations do not want to work as the problem number one, as it obtained highest mean value 2.62

with the first rank. This was followed by lack of awareness ranked second with mean value 2.43, lack of education ranked third with mean value 2.43, etc. Among other problems viz. dominating nature of high caste were also observed during the study. The findings reflect that a number of social problems play an important role in restricting the efficient implementation of watershed development programme.

Sisodia and Sharma (2008) observed that farmers were not taken in confidence in utilization of funds for watershed activities as pointed out by most of them. The budgetary provisions for various watershed activities were not discussed before beneficiaries, was expressed 2nd major constraint, progress and future plans were not discussed among beneficiaries in periodical meetings was 3rd constraint, mid-term monitoring and evaluation of watershed activities were not done was the 4th major constraint. It also concludes that the rapport and behavior of Government field functionaries with beneficiaries were among the least problem. Hence, both the constraints were ranked on 9th and 10th by the beneficiaries.

Bharathi and Badlger (2009) revealed that majority of the farm woman SHG members considered lack of formal education (47.5%) as their personal problem. They further concluded that majority of the SHG members are illiterate followed by 33.0 per cent of the farm woman 5HG members reported shortage of electricity as their technical problem, insufficient loan as their economic problem was reported by 27.50 per cent of the farm woman SHG members. Social problem i.e. lack of social mobility because of the restriction in the family was reported by (19.2%) of the SHG mem.

Chand *et al.* (2009) found that difference in wage rate, difficulties in maintaining the CPRs, difficulty to contribute in terms of cash for common works and fear of taking the land hence objection of some watershed activities were reported by the beneficiaries In DPAP watersheds. The other constraints experienced by the beneficiaries were some watershed activities not carried out in time and that some activity/works were not useful to the beneficiaries in both the watersheds. Similarly summer ploughing could have been taken up just before onset of monsoon as expressed by 42 per cent beneficiaries. In IWDP also more

casualties of tree seedling planted in common land was observed. In DPAP watershed some beneficiaries have reported that there were improper site selections for construction works also due to fixed unit cost norms.

Kumar *et al*. (2011) observed that 80.00 and 70.83 per cent of respondents respectively reported that too many schemes I targets works in regular departments as well as In ATMA resulted in no (less) time for review, therefore poor coordination exists between the stakeholders in planning, organizing and execution of ATMA activities in the district and too many vacancies results in lack of village level extension field staff to plan organize and execute the ongoing research and extension programme in agriculture and allied departments. Each one of 60.83 per cent of the respondents reported that no specific guidelines are communicated in advance, from office of the project director, ATMA in preparation of block action plan of the district and favoritism in budget allocation to their own departments first by block level technology team officers next to other developmental department's requirements. Further, same per cent (58.33) of respondents perceived that no proper planning in fixing the targets according to the specific farming situation needs of the district and lack of transport facility at BTT level for effective monitoring and evaluation of ATMA activities in the district.

Suggestions

Bharathi and Badiger (2009) revealed that 78.30 per cent of SHG members suggested that the project should be continued and started in other villages followed by 69.10 per cent of the respondents suggested loan amount should be increased. Other suggestions given by the respondents were requirements of information on banking and marketing aspects along with marketing facilities (67.50%), activities which run all season should be given (65.00%), all SHG women members should be given basic knowledge about SHGs and its importance (55.80%), problems faced by SHG members should be regularly attended to and given solutions (54.10%), follow-up should be increased (46.60%), informal education should be given (41.60%), unity should be increased (29.10%) and

09.20 per cent respondents suggested training on extraction of oil from soybean should be given.

Kumar *et al*. (2011) suggested that create separate chairman position to ATMA programme (81.66%) followed by Project Director preferably from Group officer cadre (76.66%), bridge the technical gaps through training (74.16%), plan early before season starts (65.00%), filling up of vacancy position (65.00%), block level technology team (BTT) in charge only with ADA cadre (61.66%), too many programmes under different schemes / project (59.16%), transport facilities (59.16%), in charge for appropriate position (52.50%), and simplify the excessive bureaucracy (38.33%).

Narain *et al*. (2014) found that the adoption scenario indicates that low gram productivity was the result of either poor knowledge or non-adoption or the combination of both. The productivity level also depends upon several independents variables associated with farmers adoption related to recommended gram technology.

Chapter-III

MATERIALS AND METHODS

This chapter deals with the methods and procedures used for the study. The different steps that were undertaken are listed below and the details under each step are explained in the succeeding part of the chapter.It consists of following sub-parts:-

3.1. Location

3.2. Research design

3.3. Sampling technique used

3.4. Variables, their operationalization and measurement

3.5. Instrument of data collection

3.6. Statistical methods used

3.7. Derivation of hypothesis

3.1 Location

The present investigation was conducted in Gwalior district of Madhya Pradesh which is situated in northern part of the state and covers an area of 4,560 sq. km. It lies between 26° 21’ N Latitude and 78° 18’ E Longitudeat average elevation of 211 m above sea level. Gwalior district is surrounded by Shivpuri and Sheopur districts in the west, Morena district in the north, Bhind district in the east and Datia district in the south.Gwalior district comprises of seven tehsils (Gwalior, Bhitarwar, Dabra, Chinor, City centre, Ghatigaon and Morar) and 4 blocks (Morar, Ghatigaon, Dabra, and Bhitarwar). The Gwalior district have 520 villages and 256 Gram panchayats and 4 Janpad panchayats. The geographical area of the district is 4,560sq km with a population of 20, 32,036 out of which 10, 90, 327 are Male and 9, 41, 709 are female. The literacy level of the district is 65.19 per cent.

The present study was conducted In Dabra block of Gwalior district. The total geographical area of the block is 956 km^2. The population of Dabra block is 61, 277 out of which 32, 446 are males and 28, 831 are females. The literacy in the block is 70.65 per cent. The block has 135 villages.

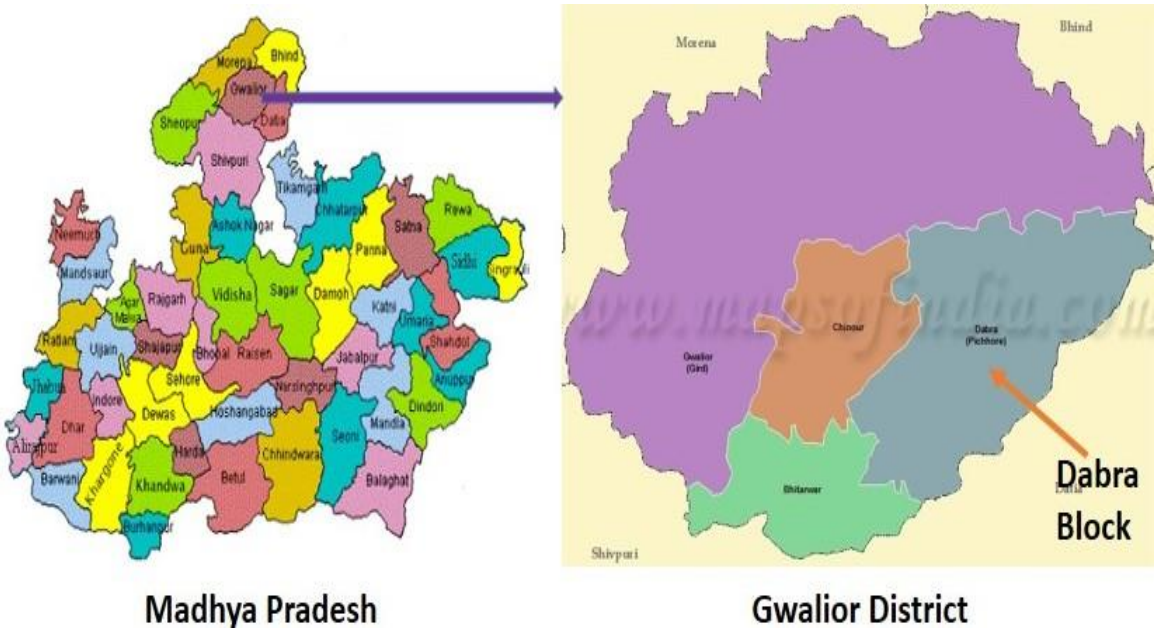


Fig. 1: Location map of investigation area

3.2 Research design

The design of research is the most important and crucial aspect of research methodology. It is the entire process of planning and carrying out the research. To seek the answers of the questions, an ex-post facto design was used in the investigation which gives Information after occurring of events.

3.3 Sampling technique used

The samples of the study were selected by three stages sampling method. These were-

A) Selection of block

B) Selection of villages

C) Selection of respondents

A) Selection of block

The study was undertaken in Gwalior district of Madhya Pradesh. Gwalior district comprises of 4 blocks namely Bhitarwar, Chinour, Dabra and Gwalior, out of these 4 blocks, Dabra block has been selected purposively, because of this block comprised more area under paddy-wheat cropping sequence and has well established paddy and wheat market as compared to the other blocks.

B) Selection of villages

The Dabra block is comprises of 156 villages. A list of ATMA villages was prepared with the help of rural agriculture extension officers, out of these 156 villages, 10 villages *viz.,* Masudpur, Kardu, Lakhiya, Girgheda, Rampura, Maharajpur, Chomo, Pathara, Ghamodpura and Girgheda were selected randomly on the basis of maximum number of beneficiaries.

C) Selection of respondents

A list of paddy and wheat grower beneficiaries of each selected village was prepared with the help of ATMA officials.Total 12 beneficiaries (4 small, 4 medium and 4 large farmers) were selected from prepared list of each selected village on the basis of simple random sampling method. Thus, the total 120 respondentswere considered as sample size of the study.

S. No.	Name of Village	Total number of beneficiaries			Number of beneficiaries selected
		Small	Medium	Large	
1.	Masudpurra	24	31	20	12
2.	Kardu	18	18	15	12
3.	Lakhiya	27	25	19	12
4.	Girgheda	37	16	15	12
5.	Rampura	19	15	20	12
6.	Maharajpur	17	11	15	12
7.	Chomo	22	18	25	12
8.	Pathara	17	22	18	12
9.	Ghamodpura	22	18	36	12
10	Girgheda	35	28	22	12

3.4 Variables, their operationalization and measurement

The Independent and dependent variables was identified and selected for the present study, their operationalization and measurement procedure were as follow:-

Variables, their operationalization and measurement

Variable	Measurement
Independent variable	
Age	Chronological age (years)
Education	Scale of Pareek and Trivedi
Family size	Scale of Pareek and Trivedi
Occupation	Scale of Pareek and Trivedi
Annual Income	In Rupees
Social participation	Scale of Pareek and Trivedi
Information seeking behavior	Structural Schedule
Scientific orientation	Scale of Supe and Singh (1969)
Level of knowledge	Structural Schedule
Level of participation	Structural Schedule
Attitude towards ATMA	Structural Schedule
Dependent variable	
Impact of ATMA on production and productivity of important crops	Index Developed

3.4.1 Operational definition of variables

A) Independent variables

1) Age

It refers to the number of years has completed by an individual at the time of investigation and was measured as per actual chronological age of the respondent. The categories formulated as under:–

S. No.	Categories	Scores
1.	Young age group	Up to 35 years
2.	Middle age group	36 to 55 years
3.	Old age group	Above 55 years

2) Education

Education was considered as a formal schooling an individual has undergone. It was operationalized by allocating suitable weight for which different levels are given below:-

S. No.	Categories	Scores
1.	Up to primary School	1
2.	Up to middle School	2
3.	Up to higher secondary	3
4.	College level education	4

3) Family size

The number of members living together in the respondent's family was considered as size of family of the respondents. They were categorized into different groups by using the classification as follows:-

S. No.	Categories	Scores
1.	Small family	Up to 4 members
2.	Medium family	5 to 10 members
3.	Large family	Above 10 members

4) Occupation

The occupation is the primary source of income which contributes most towards the upkeep of the family of the respondent. The categories and scores were assigned for each category as follows:

S. No.	Categories	Scores
1.	Farming	1
2.	Farming + business	2
3.	Farming + services	3

5) Annual Income

Thetotal annual income from all the available sources of respondents were calculated in the study and then the respondents were categorized in the following manner:-

S. No.	Categories	Scores
1.	Very low	(Up to ₹1,00,000)
2.	Low	(₹1,00,001 to ₹3,00,000)
3.	Medium	(₹3,00,001 to ₹6,00,000)
4.	High	(Above ₹6,00,000)

6) Social participation

The term social participation in this study refers to the degree of involvement of the respondents in formal/informal organization as a member or executive, office bearer or both. A social participation score was computed for each respondent on the basis of his membership and position in various formal informal organizations and categorized into following subheads:

S. No.	Categories	Scores
1.	No participation	(0 score)
2.	Low	(Up to 5 score)
3.	Medium	(6 to 10 score)
4.	High	(11 to 15 score)

7) Information seeking behavior

A set of 15 information sources were identified including personal, group and mass media and each source was given equal weightage and categories were made according to the use of information sources.The respondents were grouped in to three categories for use of information sources by using following structural schedule:

S. No.	Categories	Scores
1.	Low	(Up to 7 score)
2.	Medium	(8 to 14 score)
3.	High	(Above 14 score)

8) Scientific orientation

It was operationalized as the degree to which a farmer oriented to the use of scientific methods in decision making on farming and also indicated the attitude of a respondent toward science. It was measured with the help of scale developed by Supe and Singh (1969). The scale consisted of 6 items of which statement number-six was negatively keyed. Responses were recorded on five-point continuum as strongly agree, agree, undecided, disagree and strongly disagree and were given 7,5,4,3 and 1 scores, respectively. Reverse of the scoring was used for negative statement. The theoretical score ranged between 6-42 marks. The total scores explain the degree of scientific orientation of an individual. On the basis of range of score, three categories were developed as:

S. No.	Categories	Scores
1.	Low	(6 to 18)
2.	Medium	(19 to 30)
3.	High	(31 to 42)

9) Level of knowledge

It was operationalized on the extent to which a beneficiary has awareness of activities of ATMA programme and was measured with the help of structured schedule. Responses were recorded on 3-point continuum as complete, partial and no knowledge and were given 3, 2 and 1 scores, respectively. On the basis of range of scores, the beneficiaries were categorized into low, medium and high groups.

S. No.	Categories	Scores
1.	Low	(Up to 23)
2.	Medium	(24 to 46)
3.	High	(Above 46)

10) Level of participation

Participation was measured with the help of structured schedule. Responses were recorded on 3-point continuum as complete, partial and no participation and were given 3, 2 and 1 scores, respectively. On the basis of

range of scores, the beneficiaries were categorized into low, medium and high groups:

S. No.	Categories	Scores
1.	Low	(Up to 23)
2.	Medium	(24 to 46)
3.	High	(Above 46)

11) Attitude towards ATMA

Attitudes has been defined as the degree of positive or negative effect associated with some psychological objects. This scale consists of 10 statements. The responses were recorded on 5-point continuum ranging from strongly agree, agree, undecided, disagree and strongly disagree with scores of 4, 3, 2, 1 and 0, respectively. It was categorized into three categories as below:

S. No.	Categories	Scores
1.	Low	(Up to 13)
2.	Medium	(14 to 26)
3.	High	(Above 26)

B. Dependent variable:

Operational definition of dependent variable: Impact of ATMA on production and productivity of selected crops:

1) Production:

It was operationalized as the yield of crop per unit area of an individual grower with respect to wheat and paddy was measured in quintals per hectares. In the present study, production was determined at 2-points of references, both before and after ATMA project.

2) Productivity:

It was operationalized as a productivity per unit area under the wheat and paddy crop on the field of farmers and was measured through developed Index.The productivity in this study indicates yield under different crops grown in

various seasons. In the present study, productivity was determined at 2-points of reference, both before and after ATMA project.

3.5 Instrument of data collection:

The data were collected with the help of pretested structured by personal interview method. The schedule was specially designed so as to cover all the objectives set forth for the investigation. The interview schedule comprised of set of question related to following object:-

1. To study the profile of different categories of ATMA beneficiaries.
2. To determine the level of knowledge and participation of different categories of beneficiaries in different activities before and after the ATMA project.
3. To know the impact of ATMA in terms of production and productivity of important crops among the selected respondents.
4. To determine the relationship between dependent and independent variables.
5. To identify the constraints and suggestion of the respondents in participation of ATMA activities.

Before collecting the data, the respondents were informed about the purpose of collecting information. The responses were recorded in free and frank manner on the schedule itself.

3.6 Statistical methods used:

The data were collected on qualitative as well as quantitative aspects. The quantitative data were interpreted in terms of percentage and qualitative data were tabulated on the basis of approved categorization method as describe earlier. The following statistical techniques were used in the study:

1. Percentage
2. t-test
3. Correlation coefficient

1) Percentage:

The term percentage means a fraction whose denominator is 100 and the numerator of the fraction is called percentage.

$$P = X / N \times 100$$

Where.

P = Percentage,

X = Frequency of respondents

N = Total number of respondent

2) Paired t test:

The paired t test provides a hypothesis test of the difference between population means for a pair of random samples whose differences are approximately normally distributed. Please note that a pair of samples, each of which is not from a normal distribution, often yields differences that are normally distributed. The test statistic is calculated as:

$$t = \frac{\bar{d}}{\sqrt{s^2/n}}$$

Where,

$\bar{d}$=is the mean differences

S^2= is the sample variance

n= is the sample size

t= is a student t quintile with n-1 degree of freedom

3) Correlation coefficient:

To find out the degree of linear relationship between profile of the respondents and their impact of ATMA in terms of production and productivity of important crops.

Correlation coefficient was worked out following formula:

Correlation – coefficient. 'r' is computed by the formula

$$r = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[\, n\Sigma x^2 - (\Sigma x)^2 \,][\, n\Sigma y^2 - (\Sigma y)^2 \,]}}$$

Where,

n= number of pairs of scores

∑xy= sum of the products of paired scores

∑x= sum of x scores

∑y= sum of y scores

$\sum x^2$= sum of squared x scores

$\sum y^2$= sum of squared y scores

Absolute change: absolute change was obtained by difference between change occurs after and before condition.

Formula-

After programme – Before programme

3.7 Derivation of hypothesis:

The relevant hypotheses were formulated on the basis of objectives of the study and were tested in the null form. These were:-

General hypothesis:

There will be no association between profile of ATMA beneficiaries and impact of ATMA in terms of production and productivity of important crops.

Specific hypothesis:

Relevant hypotheses were formulated on the basis of objectives of the study and were tested in the null form, as follows:-

1. There is no association between age of the ATMA beneficiaries and change in production and productivity of important crops.
2. There is no association between education of the ATMA beneficiaries and change in production and productivity of important crops.
3. There is no association between family size of the ATMA beneficiaries and change in production and productivity of important crops.
4. There is no association between type of family of the ATMA beneficiaries and change in production and productivity of important crops.

5. There is no association between caste of the ATMA beneficiaries and change in production and productivity of important crops.
6. There is no association between occupation of the ATMA beneficiaries and change in production and productivity of important crops.
7. There is no association between annual income of the ATMA beneficiaries and change in production and productivity of important crops.
8. There is no association between size of land holding of the ATMA beneficiaries and change in production and productivity of important crops.
9. There is no association between social participation of the ATMA beneficiaries and change in production and productivity of important crops.
10. There is no association between source of information of the ATMA beneficiaries and change in production and productivity of important crops.
11. There is no association between mass media exposure of the ATMA beneficiaries and change in production and productivity of important crops.
12. There is no association between scientific orientation of the ATMA beneficiaries and change in production and productivity of important crops.
13. There is no association between level of knowledge of the ATMA beneficiaries and change in production and productivity of important crops.
14. There is no association between level of participation of the ATMA beneficiaries and change in production and productivity of important crops.
15. There is no association between attitude towards ATMA of the ATMA beneficiaries and change in production and productivity of Important.

Chapter-IV

RESULT

This chapter deals with the analysis and interpretation of collected data, which were collected from the sample of 120 ATMA beneficiaries. The data were processed keeping In view of the following objectives as:-

4.1 To study the profile of different categories of ATMA beneficiaries

4.2 To determine the level of knowledge and participation of beneficiaries in different activities before and after ATMA.

4.3 To know the impact of ATMA in terms of increasein production of important paddy and wheat crops among the selected respondents.

4.4To determine the relationship between dependent and independent variables

4.5 To identify the constraints and suggestions of the respondents in participation of ATMA activities

4.1 Profile of different categories of ATMA beneficiaries

The data collected on independent variables from ATMA beneficiaries were analyzed and results are presented here:

(1) Age:

The data on age group presented in Table 4.1 and illustrated in Fig. 2 revealed that the majority of the ATMA beneficiaries comes under middle age group with 67.50 percent, 17.50 percent beneficiaries comes under old age group while 15.00 percent beneficiaries comes under young age group.

Table 4.1: Distribution of ATMA beneficiaries according to their age

S. No.	Categories	Frequency	Percentage
1	Young(up to 35 years)	18	15.00
2	Middle (36-55 years)	81	67.50
3	Old (above 55 years	21	17.50
	Total	**120**	**100.00**

Fig. 2: Distribution of ATMA beneficiaries according to their age

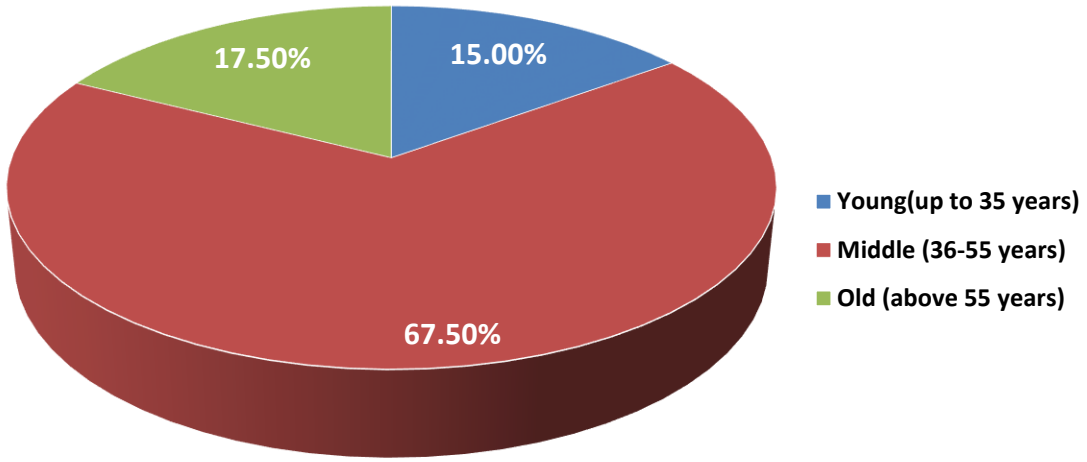
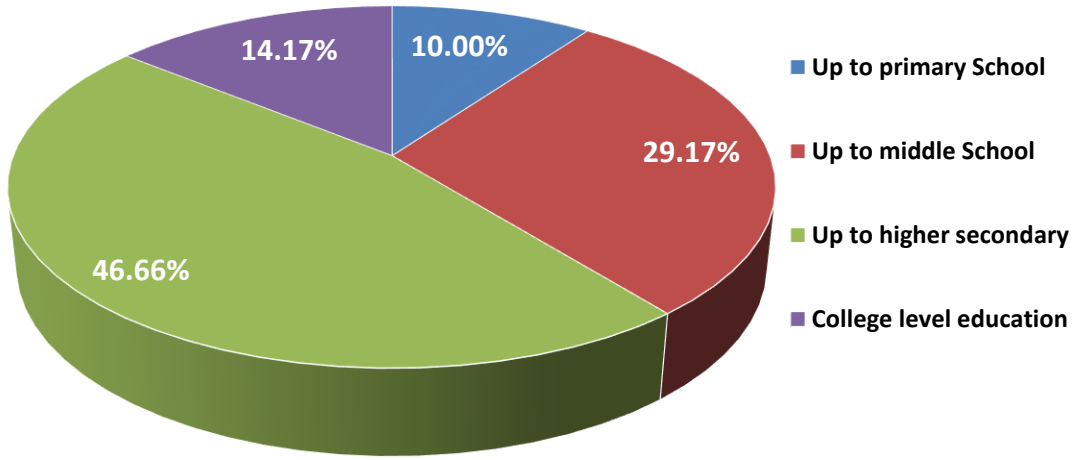


Fig. 3: Distribution of ATMA beneficiaries according to their education



(2) Education:

The data illustrated on education tract of ATMA beneficiaries in Table 4.2 and Fig. 3 showed that the majority of the beneficiaries with 46.66 percent are found under higher secondarycategory while 29.17 percent are under middle school, 14.17 percent undercollege leveleducation and minority of the beneficiaries with 10.00 percent are found under primary school category.

Table 4.2: Distribution of ATMA beneficiaries according to their education

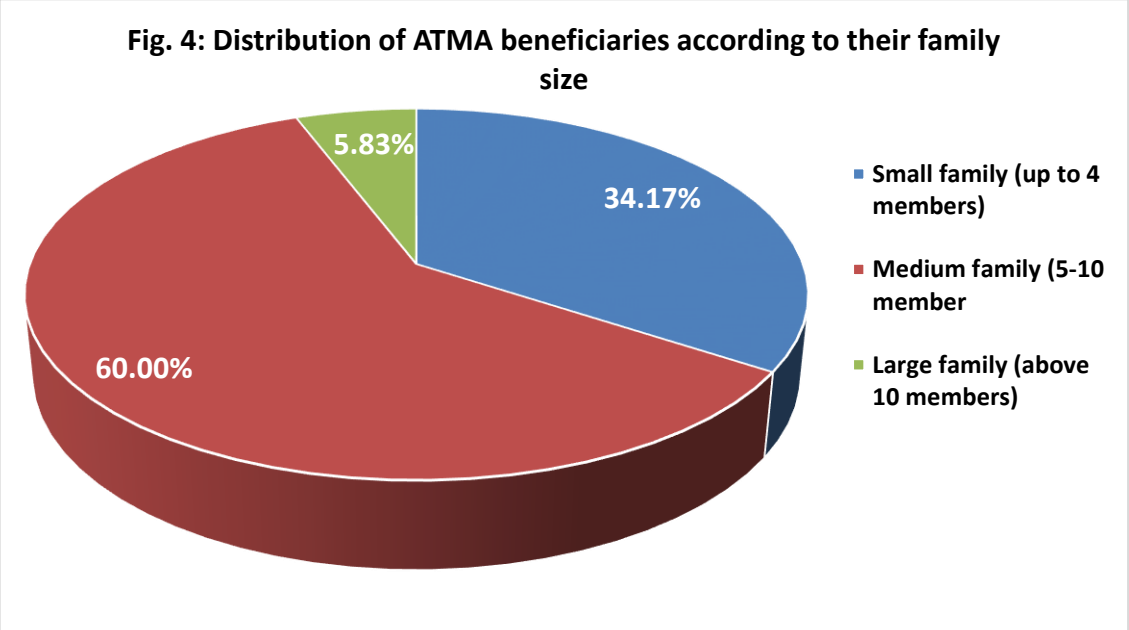
S. No.	Categories	Frequency	Percentage
1	Up to primary School	12	10.00
2	Up to middle School	35	29.17
3	Up to higher secondary	56	46.66
4	College level education	17	14.17
	Total	**120**	**100.00**

(3) Family size:

Among the family size categories (Table 4.3 and Fig. 4), the majority of the beneficiary with 60.00percent comes under medium family size group followed by small family size group with 34.17 percent beneficiaries while, minority of the beneficiaries found under large family size with 5.83 percent.

Table 4.3: Distribution of ATMA beneficiaries according to their familysize

S. No.	Family size	Frequency	Percentage
1.	Small family(up to 4 members)	41	34.17
2.	Medium family(5-10 member	72	60.00
3.	Large family(above 10 members)	7	5.83
	Total	**120**	**100.00**

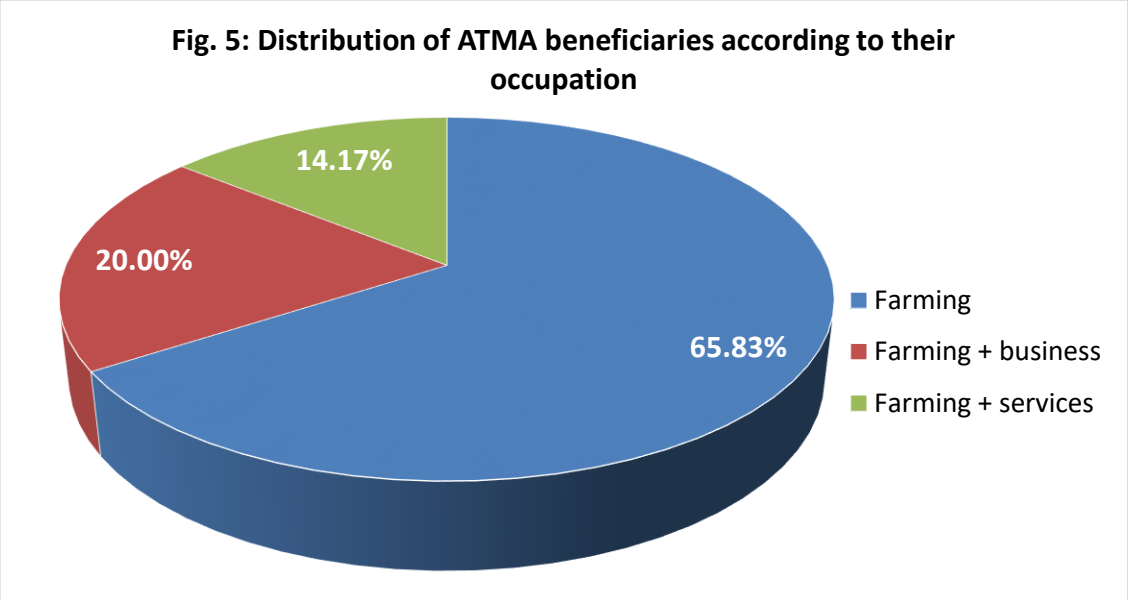


(4) Occupation:

The data presented in Table 4.4 and depicted in Fig. 5 on occupation status of ATMA beneficiaries cleared that majority with 65.83 percent of beneficiaries solely doing farming whereas,20.00 percent beneficiaries are doing farming along with business and 14.17 percent beneficiaries are doing farming along with services in different sectors.

Table 4.4: Distribution of ATMA beneficiaries according to their occupation

S. No.	Categories	Frequency	Percentage
1.	Farming	79	65.83
2.	Farming + business	24	20.00
3.	Farming + services	17	14.17
	Total	**120**	**100.00**



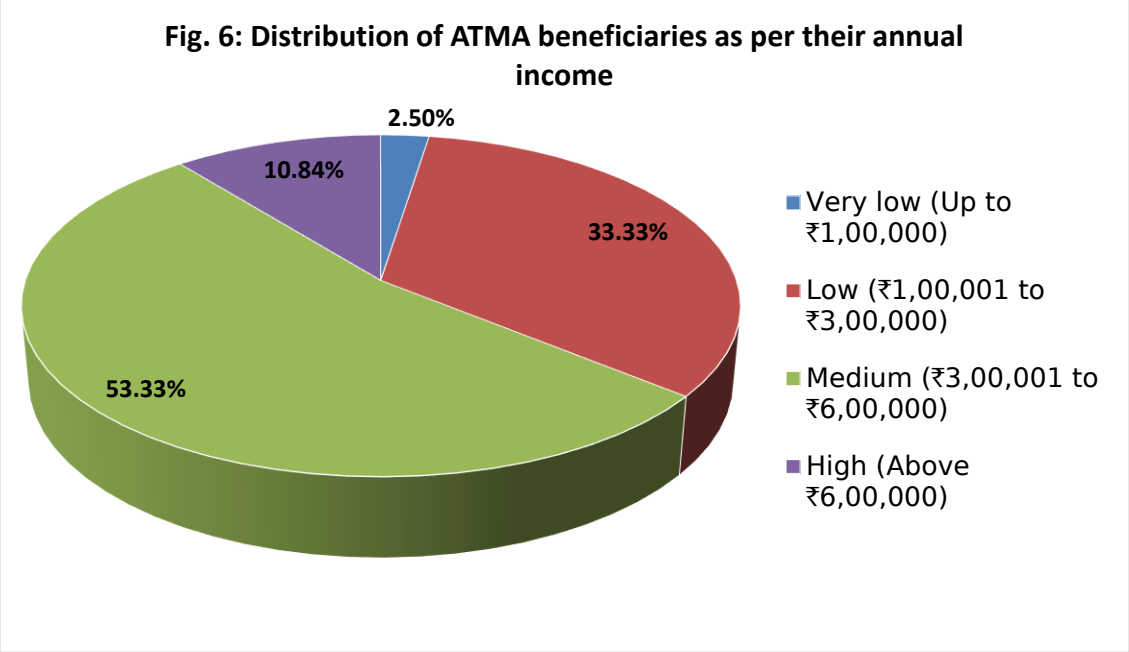
(5) Annual income:

The data on annual income of the ATMA beneficiaries presented in Table 4.5 and depicted in Fig. 6 shows that majority of the beneficiaries (53.33 percent) were found under medium income categoryfollowed by low income category with 33.33 percent beneficiaries and high income category with 10.84

percent beneficiaries while only 5.00 percent beneficiaries were found under very low income category.

Table 4.5: Distribution of ATMA beneficiaries as per their annual income

S. No.	Categories	Frequency	Percentage
1.	Very low (Up to ₹1,00,000)	3	2.50
2.	Low (₹1,00,001 to ₹3,00,000)	40	33.33
3.	Medium (₹3,00,001 to ₹6,00,000)	64	53.33
4.	High (Above ₹6,00,000)	13	10.84
	Total	**120**	**100.00**

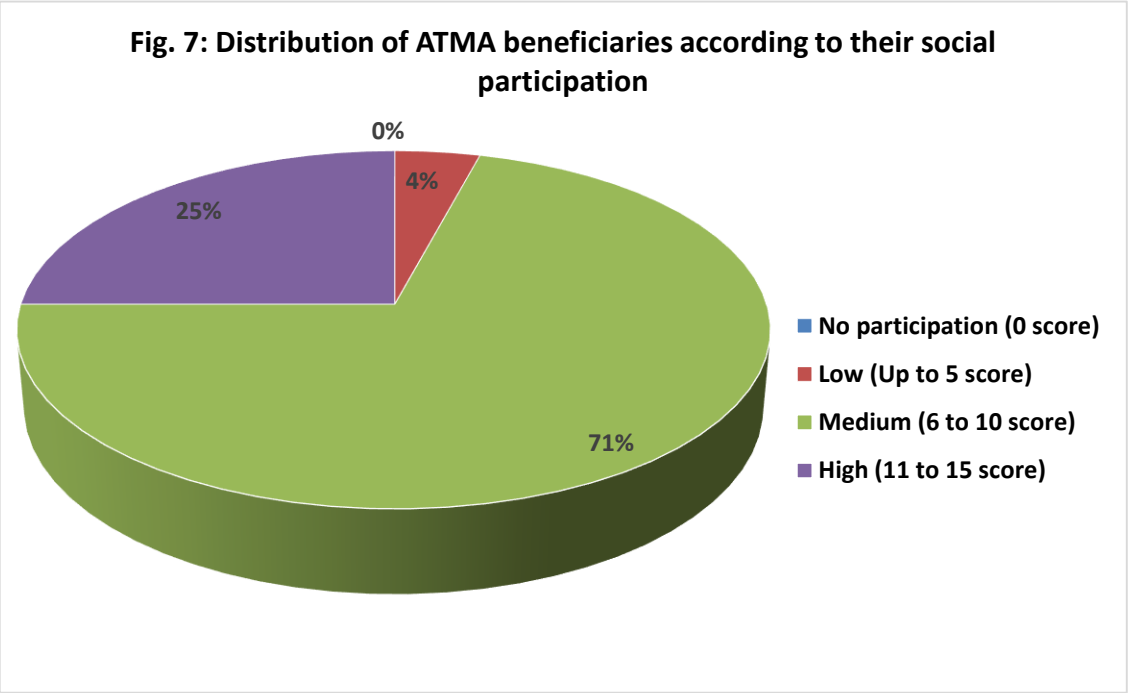


(6) Social participation

The data on social participation of ATMA beneficiaries presented in Table 4.6 and graphically presented in Fig. 7 revealed thatout of the total ATMA beneficiaries, 70.83 percent beneficiaries had found under medium social participation category followed by high social participation category with 25.00 percent beneficiaries and low participation category with 4.17 percent beneficiaries while, no beneficiary has found under no participation category.

Table 4.6: Distribution of ATMA beneficiaries according to their social participation

S. No.	Categories	Frequency	Percentage
1.	No participation (0 score)	0	0.00
2.	Low (Up to 5 score)	5	4.17
3.	Medium (6 to 10 score)	85	70.83
4.	High (11 to 15 score)	30	25.00
	Total	**120**	**100.00**

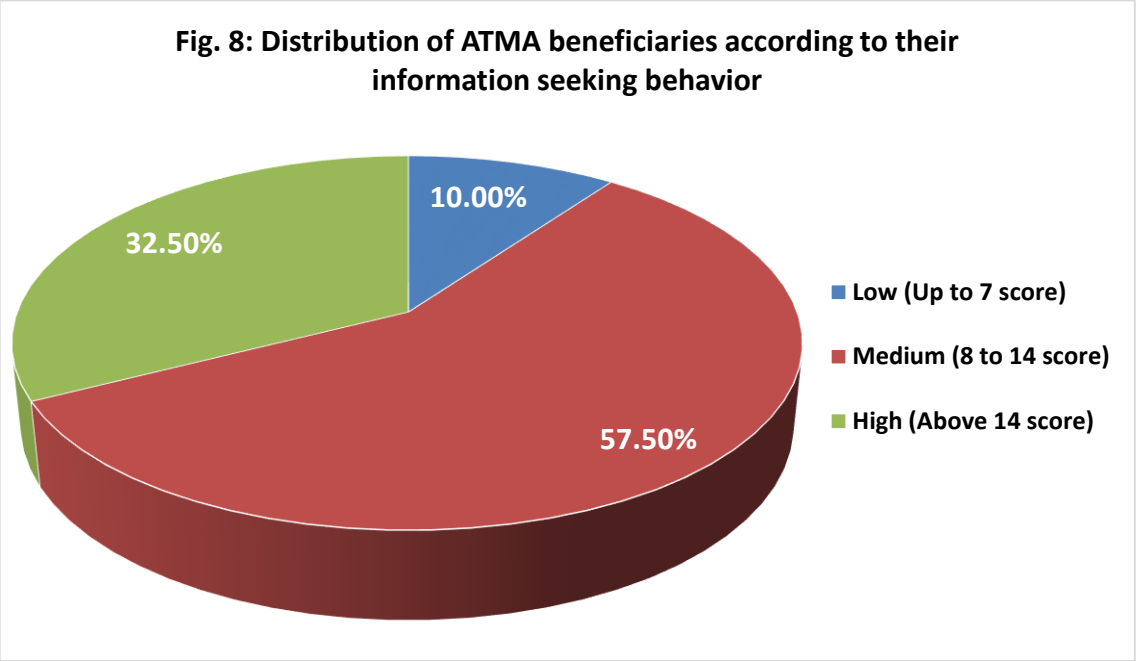


(7) Information seeking behavior

The information seeking behavior deals withawareness level of a person to know about newly information's. The data on information seeking behavior is presented in Table 4.7 and depicted in Fig. 8 revealed that the majority of the ATMA beneficiaries (57.50%) had medium level of exposure to various sources of beneficial information followed by high level of information seeking behavior with 32.50 percent beneficiaries while, only 10.00 percent ATMA beneficiaries were found under low level category to information seeking behavior.

Table 4.7: Distribution of ATMA beneficiaries according to their information seeking behavior

S. No.	Categories	Frequency	Percentage
1.	Low (Up to 7 score)	12	10.00
2.	Medium (8 to 14 score)	69	57.50
3.	High (Above 14 score)	39	32.50
	Total	**120**	**100.00**

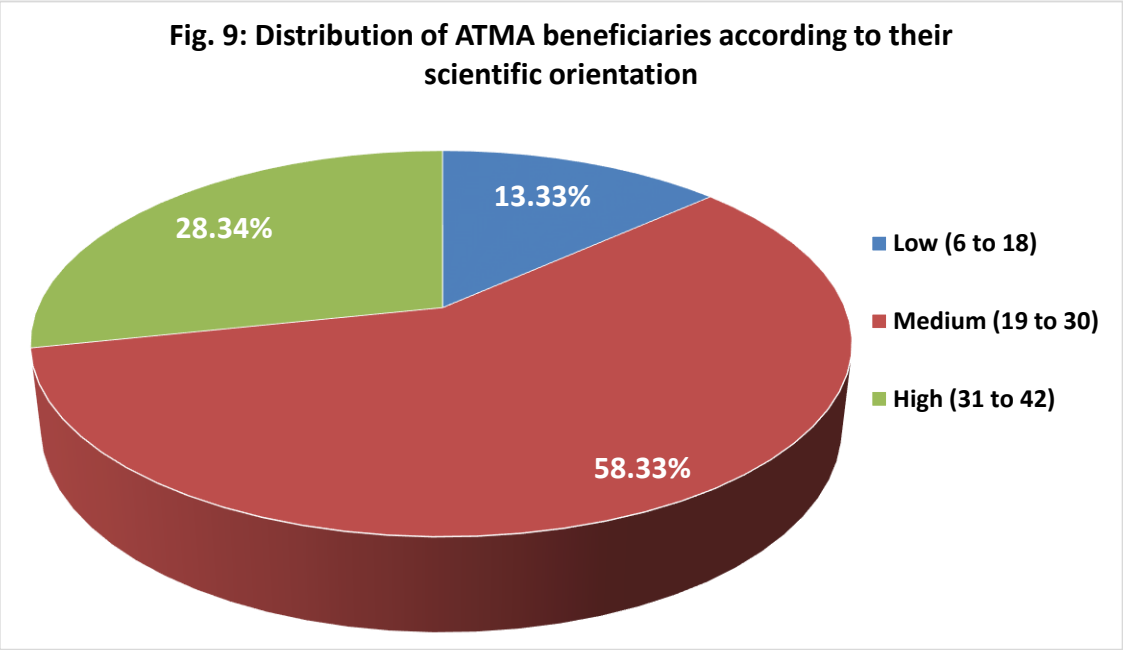


(8) Scientific orientation:

The scientific orientation is adegree to which a farmer oriented to the use of scientific methods in decision making on farming and also indicated the attitude of a respondent toward science.The distribution of respondents according to their scientific orientation presented in Table 4.8 and graphically presented in Fig. 9 showed that most of the beneficiaries (58.33%) had comes under medium level of the scientific orientation followed by high level of scientific orientation with 28.34 percent beneficiaries while, only 13.33 percent beneficiaries had comes under low level category to scientific orientation.

Table 4.8: Distribution of ATMA beneficiaries according to their scientificorientation

S. No.	Categories	Frequency	Percentage
1.	Low (6 to 18)	16	13.33
2.	Medium (19 to 30)	70	58.33
3.	High (31 to 42)	34	28.34
	Total	**120**	**100.00**

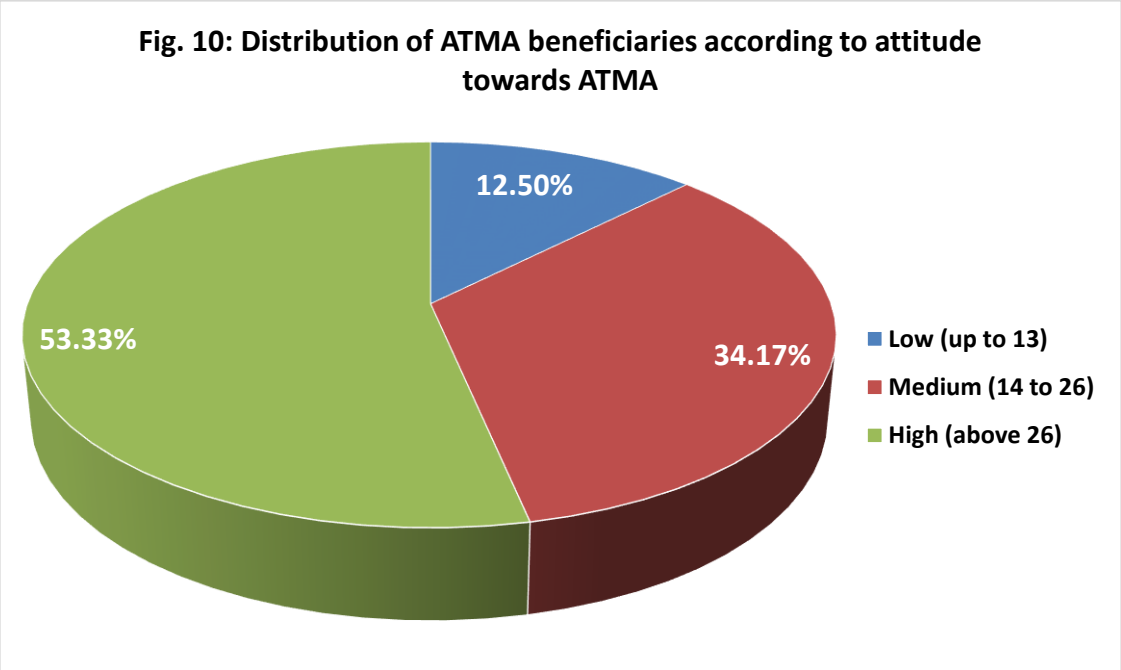


(9) Attitude towards ATMA:

Attitudes has been defined as the degree of positive or negative effect associated with some psychological objects which deals with creation of interest of farmers tointeract with ATMA officials to know about various schemes. The data on attitude towards ATMA presented in Table 4.9 and illustrated in Fig. 10 revealed that among the total beneficiaries, 53.33 percent of ATMA beneficiaries had high level of attitude towards ATMA project followed by mediumlevel of attitude with 34.17 percent beneficiaries whereas, 12.50 percent beneficiaries had comes under low level category to attitude towards ATMA project.

Table 4.9: Distribution of ATMA beneficiaries according to attitudetowards ATMA

S. No.	Categories	Frequency	Percentage
1.	Low (up to 13)	15	12.50
2.	Medium (14 to 26)	41	34.17
3.	High (above 26)	64	53.33
	Total	**120**	**100.00**



4.2 Level of knowledge and participation of different categories of beneficiaries in the different activities before and after the Implementation of ATMA project:

4.2.1 Level of knowledge:

The data presented in Table 4.10on various activities related to level of knowledge *viz.,*project scheme, training, demonstration, visits and others activities. The data revealed that 56.67 per cent of the total beneficiaries had partial knowledge about project scheme whereas, 28.33 per cent of beneficiaries were reported under complete level of knowledge and only 15.00 per cent beneficiaries had no knowledge about programme scheme.

Table 4.10: Shows the distribution of ATMA beneficiaries according to their level of knowledge about different activities of ATMA

S. No.	Activities	Level of Knowledge		
		No	Partial	Complete
1.	Knowledge about programme scheme	18 (15.00)	68 (56.67)	34 (28.33)
2.	Knowledge about training	29 (24.17)	61 (50.83)	30 (25.00)
3.	Knowledge about demonstration	22 (18.33)	61 (50.83)	37 (30.84)
4.	Knowledge about visit	32 (26.67)	53 (44.17)	35 (29.16)
5.	Knowledge about other activities	53 (44.17)	43 (35.83)	24 (20.00)

Note: Figures in parenthesis indicates the percentage

As regards to knowledge about training, 50.83 per cent of the total ATMA beneficiaries had partial knowledge about training while, 25.00 per cent of the ATMA beneficiaries had complete knowledge and 24.17 per cent of the beneficiaries had no knowledge about training conducted under ATMA project.

Regarding knowledge about demonstration, majority (50.83%) of the total ATMA beneficiaries had partial knowledge whereas30.84 per cent beneficiaries had complete knowledge and remaining 18.23 per cent beneficiaries had no knowledge about demonstration conducted under ATMA project.

In order to knowledge about visit, 44.17 per cent of the total ATMA beneficiaries had partial knowledge about visit under ATMAproject while, 29.16 per cent beneficiaries had complete knowledge about visit andrest 26.67 per cent beneficiaries had no knowledge about visit under ATMA project.

As regards to knowledge about others activities, majority of the beneficiaries (44.17%) had no knowledge whereas,35.83 per cent beneficiaries had partial and only 20.00 per cent beneficiaries had complete knowledge about other activities which are also organized by ATMA project.

It can be concluded that majority of the beneficiaries had partial knowledge about project scheme, training, demonstration and visit under ATMA project followed by second majority of beneficiaries had compete knowledge of these activities whereas, majority of beneficiaries had no knowledge about others activities in ATMA project followed by category of beneficiaries had partial knowledge about other activities.

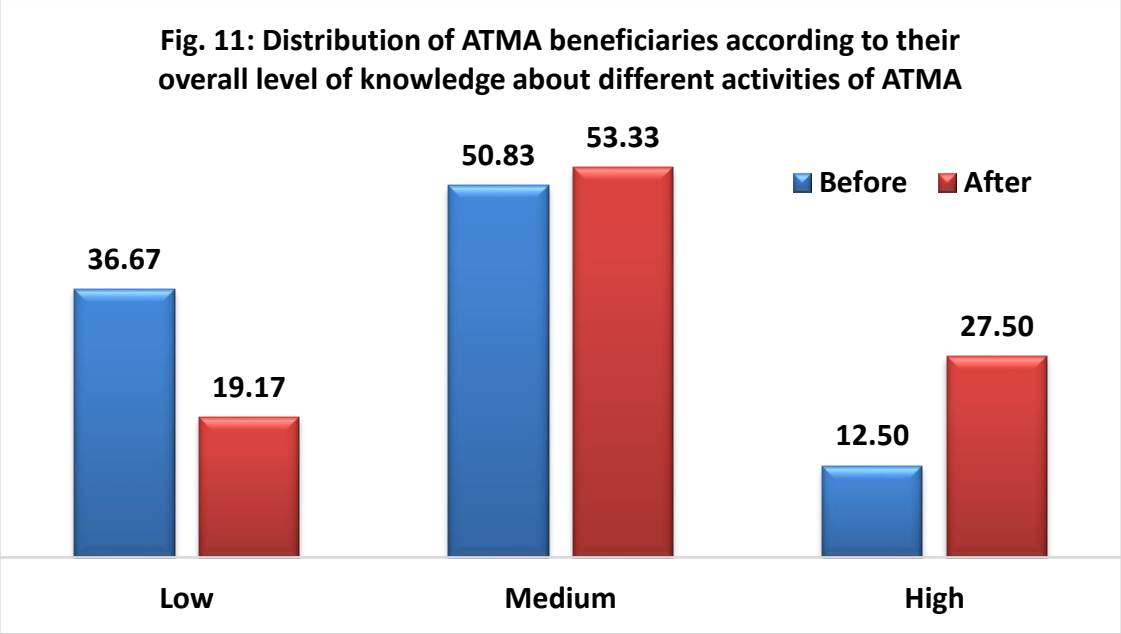
Overall level of knowledge

The data presented in Table 4.11and depicted in Fig. 11 on distribution of ATMA beneficiaries according to their overall level of knowledge shows that the majority of beneficiaries (50.83%) was found under medium category before the implementation of ATMA programme and it was increased with53.33 per cent beneficiaries after implementation of ATMA project. It was further observed that 36.67 per cent respondents had low level of overall knowledge before implementation of ATMA project while, only 19.17 respondents had low knowledge after implementation of ATMA project. The minority of the total respondents (12.50%) had high level of overall knowledge before implementation of ATMA project which was rapidly increased to more than doublerespondents (27.50%) after implementation of ATMA project.

It can be concluded that majority of the ATMA beneficiaries had medium level of knowledge about the different activities of ATMA programme followed by high level of knowledge.

Table 4.11: Distribution of ATMA beneficiaries according to their overall level of knowledge about different activities of ATMA

Categories	Before		After	
	Frequency	Percentage	Frequency	Percentage
Low (up to 23)	44	36.67	23	19.17
Medium (23 to 46)	61	50.83	64	53.33
High (above 46)	15	12.50	33	27.50
Total	120	100.00	120	100.00



For showing level of knowledge t -test is subjected:

Table 4.12: Mean before and after implementation of ATMA programme and t-test value

Categories	No. of respondents	Mean		t – value	Table Value
		Before	After		
Small farmers	40	34.40	39.36	19.57*	2.02
Medium farmers	40	35.20	40.32	15.16*	2.02
Larger farmers	40	32.13	36.48	12.30*	2.02
Total	**120**				

*Significant at 0.05 probability level

1) Small farmers

The mean value of knowledge was worked out before and after implementation of ATMA programme and presented in Table 4.12 shows that variation of mean values 34.40 and 39.36 before and after implementation of the project, respectively. When these data were subjected to t-test, the calculated value of t was found 19.57, which was greater than the table value of 't' (2.02) at 5% of level of significance. Thus, it is concluded that there was significant difference found between before and after implementation of

programme with respect to knowledge indicating significant impact of ATMA programme on knowledge of small farmers..

2) Medium farmers

The data on knowledge of medium farmers presented in Table 4.12 shows that the mean value of knowledge was recorded 35.20 and 40.32for before and after implementation of ATMA programme,respectively. When these data were subjected to host the calculated ’t’value was found to be 15.16, which was greater than the tabulated‘t’ value (2.02) at 5% of level of significance. Thus, it is concluded that there was significant difference between before and after Implementation of programme with respect to knowledge.

3) Large farmers

Further it was observed from Table 4.12 that the variation in mean value of knowledge was 32.13 and 36.48for before and after implementation of ATMA programme, respectively with calculated value oft' was 12.30, which was greater than the table value of 't' (2.02) al 5% of level of significance thus, it is concluded that there was significant difference before and after implementation of programme with respect to knowledge.

4.2.2 Level of participation:

The data presented in Table 4.13 shows on extent of participation level regarding project scheme, training, demonstration, visit and others activities.

Table 4.13: Shows the distribution of ATMA beneficiaries according to their level of participation about different activities of ATMA:

S. No.	Activities	Level of Participation		
		No	Partial	Complete
1.	Participation in programme scheme	15 (12.50)	78 (65.00)	27 (22.50)
2.	Participation in training	28 (23.33)	63 (52.50)	29 (24.17)
3.	Participation in demonstration	17 (14.17)	71 (59.17)	32 (26.66)
4.	Participation in visit	38 (31.67)	43 (35.83)	39 (32.50)
5.	Participation in other activities	71 (59.17)	32 (26.67)	17 (14.17)

The data revealed that majority of the total beneficiaries (65.00%)had partial participation in project scheme followed by complete level of participation with 22.50 per cent beneficiaries while, only 12.50 per cent of ATMA beneficiaries had no participation.

As regards to participation In training, majority (52.50%) of the ATMA beneficiaries had partial participation in training programme followed by complete participation with 24.17 per cent of the ATMA beneficiaries while 23.33 per cent ATMA beneficiaries had no participation.

Regarding participation in demonstration, 59.17 per cent of the ATMA beneficiaries had partial participation followed by complete participation with 26.66 per cent beneficiaries whereas,14.17 cent beneficiaries had no participation in demonstration conducted by ATMA project.

The 35.83 per cent beneficiaries had partial level of participation in visit under the ATMA project followed by complete level of participation and no level of participation with 32.50 per cent and 31.67 per cent beneficiaries, respectively.

As regards to others activities, 59.17 per cent of the ATMA beneficiaries had no participation followed by partial participation with 26.67 per cent beneficiaries while, only 14.17 per cent beneficiaries had complete level of participation in other activities.

Further, it can be concluded that majority of ATMA beneficiaries had partial participation in project scheme, training, demonstration and visit while majority of the beneficiaries had no participation in others activities organized under ATMA project.

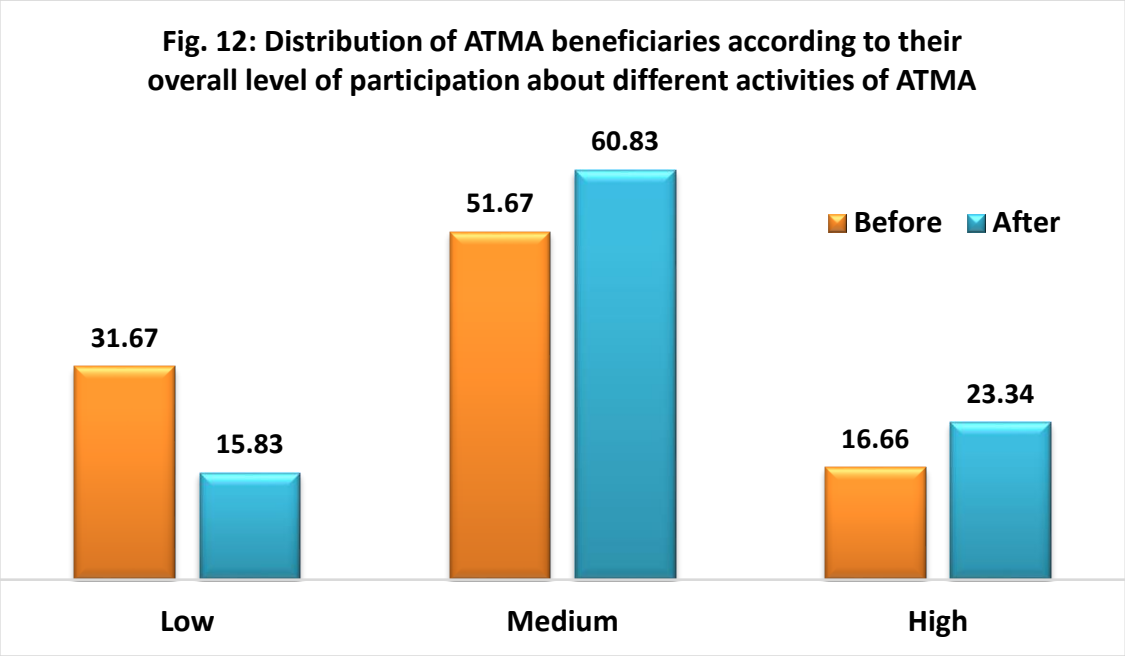
Overall level of participation

The data presented in Table 4.14and graphically presented in Fig. 12 shows that the distribution of ATMA beneficiaries according to their overall level of participation. The majority of the beneficiaries before the implementation of ATMA project had medium level of overall participation with 51.67 per cent beneficiaries followed by low level and medium level with 31.67 and 16.66 per cent beneficiaries, respectively whereas, positive improvement was observed in overall level of participation after implementation of ATMA project and 60.83 per

cent beneficiaries had medium level of overall participation followed by high level of participation 23.34 per cent beneficiaries while, only 15.83 per cent beneficiaries were found under low level of overall participation. Hence, It can be concluded that majority of the ATMA beneficiaries had medium level of participation about the different activities of ATMA project.

Table 4.14: Distribution of ATMA beneficiaries according to their overall level of participation about different activities of ATMA.

Categories	Before implementation of ATMA		After implementation of ATMA	
	Frequency	Percentage	Frequency	Percentage
Low (up to 23)	38	31.67	19	15.83
Medium (24 to 46)	62	51.67	73	60.83
High (above 46)	20	16.66	28	23.34
Total	120	100.00	120	100.00



For showing level of participation t- test is subjected:

1) Small farmers

The data presented in Table 4.15 shows that the mean values of participation along with t test value worked out for before and after

implementation of ATMA project. The data Indicated variation in mean of before (34.40) and after (37.50)implementation of ATMA projectwith calculated value of t test 12.93, which was greater than the table value of 't' (2.02) at 5 per cent level of significance. Thus, it is concluded that there was significant difference before and after implementation of project with respect to participation of small farmers.

Table 4.15: Mean before and after Implementation of ATMA project and t-test value

Categories	No. of respondents	Mean		t – value	Table Value
		Before	After		
Small farmers	40	34.40	37.50	12.93*	2.02
Medium farmers	40	35.23	38.08	11.42*	2.02
Large farmers	40	32.22	35.90	10.62*	2.02
Total	**120**				

* Significant at 0.05 probability level

2) Medium farmers

The presented in Table 4.15 also revealed that the mean value of participation was 35.23 and 38.08 for before and after implementation of ATMA project, respectively. The calculated value of ttest was found 11.42, which was greater than the table value of 't' (2.02) at 5 per cent level of significance thus, it is concluded that there was significant difference before and after implementation of project with respect to participation of medium farmers.

3) Large farmers

Further data presented in Table 4.15 shows that the mean value of participation was increased after implementation of the project. The mean 32.22 and 35.90 was noted for before and after implementation of ATMA project, respectively. When these data were subjected to t-test, the calculated value of't' was found 10.62,which was greater than the table value of 't' (2.02) at 5 per cent level of significance hence, there was significant difference found between before and after implementation of project with respect to participation of large farmers.

4.3 Impact of ATMA in terms of production and productivity of important crops among the selected respondents:

4.3.1 Impact of ATMA on production of paddy crop:

The data presented in Table 4.16 and illustrated in Fig.13 shows distribution of ATMA beneficiaries according to their production of paddy crop. The total paddy production of small farmers was 1764q before implementation of the project, which was increased about 178q and noted total 1942q production after implementation of the ATMA project.

Table 4.16: Shows the Impact of ATMA on production of paddy crop

Categories	No. of Respondents	Before	After	Change in production
		Total production (in quintal)	Total production (in quintal)	
Small farmers	40	1764	1942	+178
Medium farmers	40	4453	4952	+499
Large farmers	40	8927	9456	+529

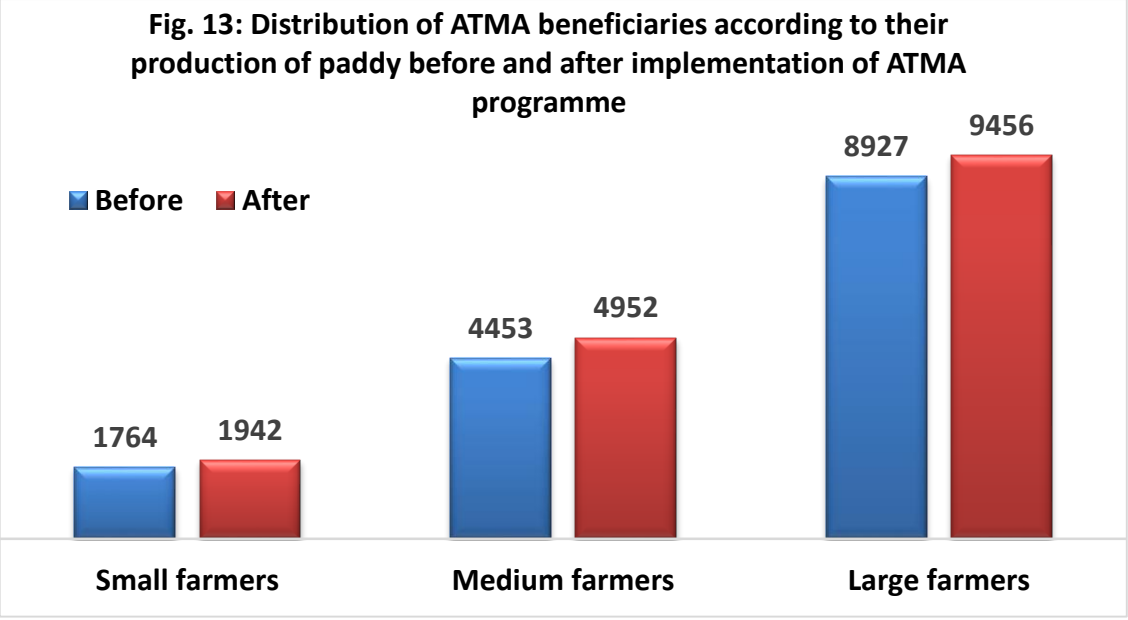


Fig. 13: Distribution of ATMA beneficiaries according to their production of paddy before and after implementation of ATMA programme

The total paddy production of the medium farmers was 4453q before the implementation of the ATMA project, which was increased about 499q and total paddy production was 4952q after the Implementation of the project.

The data further revealed that the total paddy production of large farmers was 8927qbefore implementation of the project, which was increased about 529q and total production was 9459q after implementation of the ATMA project.

The positive and significant change was seen in total paddy production among all the categories of farmers.Hence, it can be concluded that the ATMA project has played significant role in changing the production of paddy crop.

For showing impact on production t test is subjected

Table 4.17: Mean of paddy production before and after implementation of ATMA project and t-test value

Categories	No. of respondents	Mean		t – value	Table Value
		Before	After		
Small farmers	40	44.10	48.55	13.25*	2.02
Medium farmers	40	111.33	123.55	17.64*	2.02
Large farmers	40	223.17	236.40	14.45*	2.02
Total	**120**				

*Significant at 0.05 probability level

1) Small farmers

The data on mean value of production of paddy crop for before and after Implementation of ATMA project along with their tabulated value of t-test presented in Table 4.17 shows that the average production of paddy crop was 44.10 and 48.55 for before and after implementation of the project, respectively.While, these data were subjected to t-test, the calculated value oft was found 13.25, which was significantly higher than the table value of ‘t' (2.02) at 5 per cent level of significance. Thus, it is concluded that there was significant difference found between productionof paddyin before and after implementation of the project.

2) Medium farmers

The data in Table 4.17also shows that the variation of two mean 111.33 and 123.55for before and after implementation of ATMA project, respectively. While, these data were subjected to t-test the calculated value oft was found

17.64, which was greater than the table value of 't' (2.02) at 5 per cent level of significance. Hence, it is concluded that there was significant difference found between before and after implementation of project with respect to paddy production.

3) Large farmers

Further data presented in Table 4.17 revealed that the mean value 223.17 and 236.40 was worked out for before and after Implementation of ATMA project. The calculated value of t-test was 14.45, which was greater than the table value of' t' (2.02) at 5 per cent level of significanceand concluded that the significant difference was found in paddy production between before and after implementation of the project.

4.3.2 Impact of ATMA project on productivity of paddy crop:

The data presented in Table 4.18 shows the distribution of ATMA beneficiaries according to their productivity of paddy crop. The average paddy productivity of small farmers was 29.78q before implementation of ATMA project however, it was increased about 2.37q and average productivity was recorded 32.15q after implementation of the project.

Table 4.18 Shows the Impact of ATMA on productivity of paddy crop.

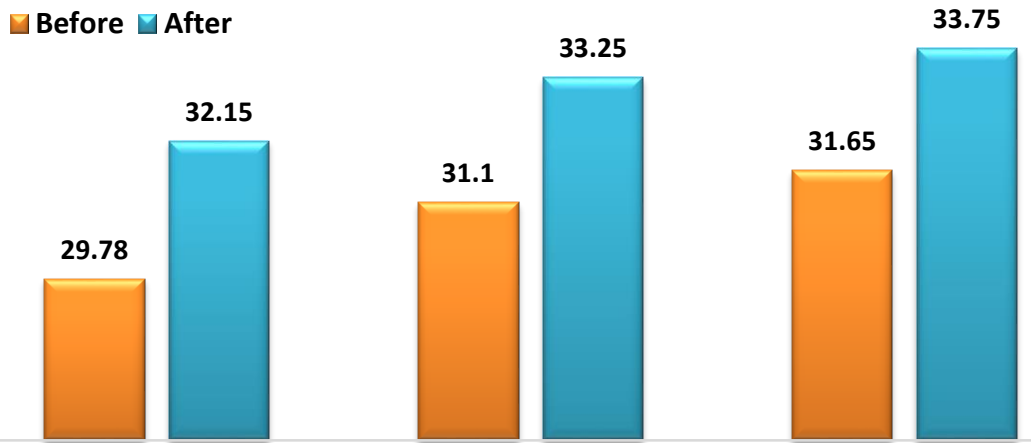
Categories	No. of Respondents	Before	After	Change in productivity (in quintal)
		Average productivity (in q/ha)	Average productivity (in q/ha)	
Small farmers	40	29.78	32.15	+2.37
Medium farmers	40	31.10	33.25	+2.15
Large farmers	40	31.65	33.75	+2.10

The data also revealed that the average productivity of paddy crop was 31.10q reported by medium farmers before implementation of the project however, after implementation of the project, it was recorded 33.25q with an increase about 2.15q.

Further data presented in Table 4.18 shows that the average productivityof paddy crop was 31.65q before implementation of ATMA project

as reported by large farmers, which was increased about 2.10q after implementation of ATMA project and recorded average productivity 33.75q.

Fig. 14: Distribution of ATMA beneficiaries according to their productivity of paddy before and after implementation of ATMA programme



The significant changesin paddy productivity were seen among all the categories of beneficiaries after implementation of the ATMA project in the Dabra block of the Gwalior district. Therefore, it can be concluded that ATMA project has played significant role in changing the productivity of paddy crop under all the categories of farmers.

For showing Impact on productivity t test is subjected.

Table 4.19: Mean before and after implementation of ATMA project and t-test value

Categories	No. of respondents	Mean		t – value	Table Value
		Before	After		
Small farmers	40	29.78	32.15	13.62*	2.02
Medium farmers	40	31.10	33.25	12.11*	2.02
Large farmers	40	31.65	33.75	9.54*	2.02
Total	120				

*Significant at 0.05 probability level

1) Small farmers

The data presented in Table 4.19 shows that the mean value of productivity was 29.78 and 32.15 for before and after Implementation of ATMA project. However, when these data were subjected to t-test, the calculated value of't' was found to be 13.62 which was greater than the table value of t (2.02) at 5 per cent level of significance. Thus, it is concluded that there was significant difference before and after implementation of project with respect to productivity under small farmer's category.

2) Medium farmers

The data presented in Table 4.19 on medium farmers shows that the mean value of productivity was 31.10 and 33.75 for before and after implementation of the project, respectively. The data were subjected to t-test and the calculated value of 't' was found to be 12.11, which was greater than the table value of 't' (2.02) at 5 per cent level of significance. Thus, it is concluded that there was significant difference before and after implementation of project with respect to productivity.

3) Large farmers

The data presented in Table 4.19also shows that the mean value of productivity was 31.65 and 33.75 for before and after implementation of the ATMA project, respectively. However, when these data were subjected to t-test, the calculated value of 't' was found 9.54, which was greater than the table value of t (2.02) at 5 per cent level of significance therefore, it is concluded that the significant difference was found in paddy productivity between before and after Implementation of the project.

4.3.3 Impact of ATMA project on production of wheat crop:

The data presented in Table 4.20 shows the distribution of ATMA beneficiaries according to their production of wheat crop in before and after implementation of the ATMA project. The small farmers reported that the total production of wheat was 1312q before implementation of the project and it was 1415q with an increase about 103q after the implementation of the project.

The total production of wheat crop was 3235q before implementation of the project as reported by the medium farmers, however it was found 3711q with an increase of about 416q after implementation of the ATMA project.

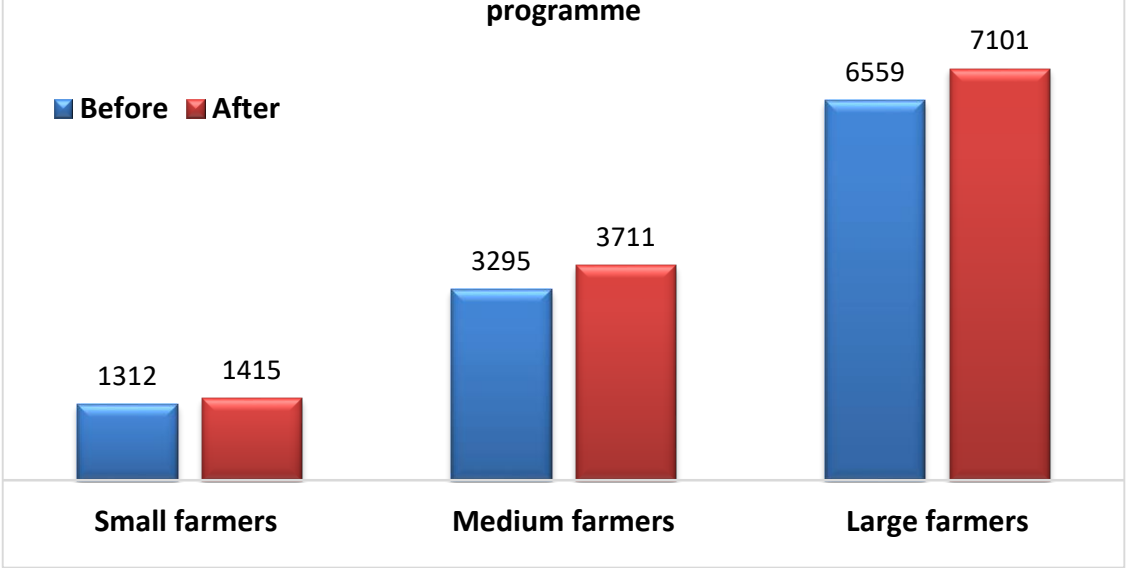
The total 6559q wheat production was obtained by large farmers before implementation of the ATMA project however, it was increased about 542q and total 7101q wheat production was recorded after the implementation of the ATMA project.

Table 4.20: Shows the Impact of ATMA on production of wheat crop:

Categories	No. of Respondents	Before	After	Change in productivity (in quintal)
		Total production (in quintal)	Total production (in quintal)	
Small farmers	40	1312	1415	+103
Medium farmers	40	3295	3711	+416
Large farmers	40	6559	7101	+542

As regard to change in production of wheat is concern, significant change was seen among all the categories of farmers. Hence, it can be concluded that the ATMA project has played significant role in changing the production of wheat crop in all the three categories of the farmers.

Fig. 15: Distribution of ATMA beneficiaries according to their production of wheat before and after implementation of ATMA programme



For showing Impact on production t- test is subjected:

Table 4.21: Mean before and after Implementation of ATMA project and t-test value

Categories	No. of respondents	Mean		t – value	Table Value
		Before	After		
Small farmers	40	32.80	35.37	9.62*	2.02
Medium farmers	40	82.37	92.77	12.93*	2.02
Large farmers	40	163.97	171.75	9.60*	2.02
Total	**120**				

*Significant at 0.05 probability level

1) Small farmers

The data presented in Table 4.21shows that the mean value of production indicated that the variation of two mean 32.80 and 35.37 for before and after implementation of ATMA project, respectively. When these data were subjected to t-test, the calculated value of‘t’ was found to be 9.62, which was greater than the table value of t (2.02) at 5 per cent level of significance. Thus, it is concluded that there was significant difference found between before and after implementation of the project with respect to production.

2) Medium farmers

The data presented in Table 4.21 revealed that the mean value of production was 82.37 and 92.77 for before and after implementation of ATMA project, respectively with the calculated value of ‘t' was found to be 12.93, which was greater than the table value of 't' (2.02) at 5 per cent level of significance. Thus, it is concluded that there was significant difference observed between before and after implementation of the project with respect to production under medium category of the farmers.

3) Large farmers

The data presented in Table 4.21also shows that the mean value of production was 163.97 and 171.75 for before and after implementation of the ATMA project, respectively. The calculated value of t-test was round to be 9.60

and it was greater than the table value of (2.02) at 5 per cent level of significance hence, it is concluded that there was significant difference found in productions between before and after implementation of the ATMA project.

4.3.4 Impact of ATMA project on productivity of wheat crop:

The data presented in Table 4.22 shows the distribution of ATMA beneficiaries according to their productivity of wheat crop before and after implementation of the ATMA project.

Table 4.22: Shows the impact of ATMA on productivity of wheat crop:

Categories	No. of Respondents	Before	After	Change in productivity (in quintal)
		Average productivity (in quintal)	Average productivity (in quintal)	
Small farmers	40	21.53	23.75	+2.22
Medium farmers	40	22.63	25.33	+2.70
Large farmers	40	23.42	26.13	+2.71
Total	**120**			

In case of small farmers, the data revealed that the average productivity was 21.53q before the implementation ofthe crop improvement programme under ATMA project whereas, the productivity was 23.75q after the implementation of ATMA project with a change of 2.22q.

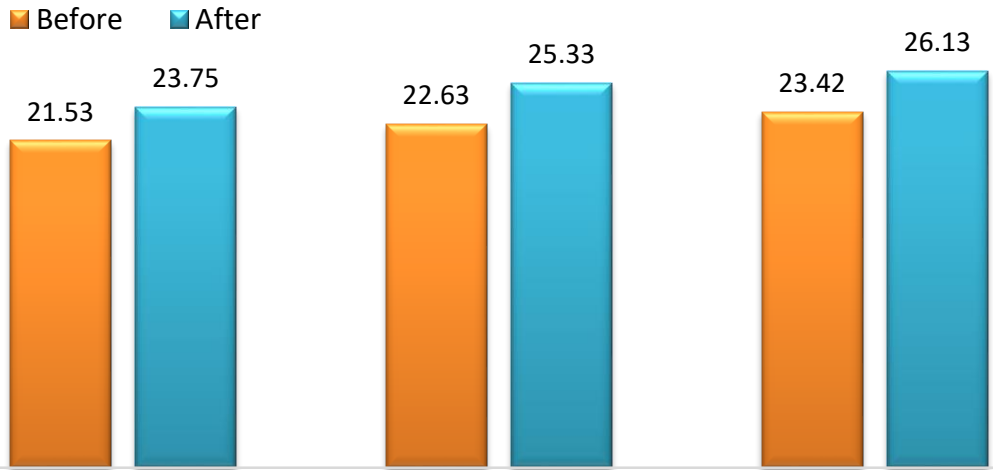
The productivity of wheat crop was 22.63q as reported by the medium farmers before the implementation of the project, which was positively changed by 2.70q and notes average productivity of 25.33q after the implementation of the ATMA project.

The productivity of wheat crop before implementation of ATMA project was 23.42q as reported by large farmers while, it was improved by 2.71q and average productivity of wheat crop was found 26.13q after the implementation of the ATMA project.

As regard to change in productivity of wheat is concern, significant change was observed among all the categories of farmers and it can be

concluded that ATMA project has played significant role in improving the productivity of wheat crop in all the categories of the farmers.

Fig. 16: Distribution of ATMA beneficiaries according to their productivity of wheat before and after implementation of ATMA programme



For showing Impact on productivity t- test is subjected.

Table 4.23: Mean before and after implementation of ATMA project and t-test value

Categories	No. of respondents	Mean		t – value	Table Value
		Before	After		
Small farmers	40	21.53	23.75	14.45*	2.02
Medium farmers	40	22.63	25.33	12.89*	2.02
Large farmers	40	23.42	26.13	9.34*	2.02
Total	**120**				

* Significant at 0.05 probability level

1) Small farmers

The data presented in Table 4.23on wheat productivity of small farmers shows that the mean value of productivity for before and after implementation of the ATMA project. The data indicated variation in both mean 21.53 and 23.75 for before and after implementation of ATMA project, respectively. When these data were subjected to t-test, the calculated value of‘t’ was found to be 14.45,

which was significantly higher than the table value of ‘t’ (2.02) at 5 per cent level of significance concluded that the wheat productivity of small farmers were significantly improved with implementation of the ATMA project .

2) Medium farmers

Further data presented in Table 4.23on wheat productivity of medium farmers revealed that the mean value of wheat productivity was 22.63 and 25.33 for before and after implementation of ATMA project, respectively. When data were tested with t-test, the calculated value of ‘t’ was found to be 12.89 as compare to the table value of‘t’ (2.02) at 5 per cent level of significance and it is concluded that the productivity of wheat crop was significantly differ before and after implementation of the ATMA project for the category of medium farmers.

3) Large farmers

The data presented in Table 4.23on wheat productivity of large farmers shows that the mean value of productivity was 23.42 and 26.13for before and after implementation of the ATMA project, respectively. However, these data were subjected to t-test, the calculated value of’t’ was found to be 9.34 as compare to the table value of‘t’ (2.02) at 5 per cent level of significance and results concluded that the significant difference was found between before and after implementation of the ATMA project with respect to productivity of the wheat crop.

4.4 Relationship between dependent and Independent variables:

The zero order correlation coefficient between 11 different variables and Impact of ATMA on production and productivity of paddy (Y1, Y2) and wheat (Y3, Y4) are given in table 4.24.

The data on relation between independent and dependent variables presented in Table 4.24 inferred that impact in production and productivity had significant to highly significant and positive correlation with occupation (X_4), annual income (X_5), social participation (X_6), information seeking behavior (X_7), scientific orientation (X_8), level of knowledge (X_9), level of participation (X_{10}) and attitude towards ATMA (X_{11}). However, production and productivity did not have any association with age (X_1), education (X_2) and family size (X_3) of the respondents.

Table 4.24 Relationship between independent variables and impact on production and productivity of important crops:

S. No.	Independent Variables (X)	Dependent Variable (Y)			
		(Y_1)	(Y_2)	(Y_3)	(Y_4)
1.	Age (X_1)	-0.087	-0.078	-0.136	-0.177
2.	Education (X_2)	-0.166	-0.153	-0.165	-0.113
3.	Family size (X_3)	-0.149	-0.115	0.013	0.096
4.	Occupation (X_4)	0.543**	0.197*	0.535**	0.212*
5.	Annual income (X_5)	0.904**	0.328**	0.820**	0.199*
6.	Social participation (X_6)	0.663**	0.285**	0.613**	0.213*
7.	Information seeking behavior (X_7)	0.750**	0.396**	0.660**	0.228*
8.	Scientific orientation (X_8)	0.794**	0.187*	0.662**	0.191*
9.	Level of knowledge (X_9)	0.388**	0.239*	0.367**	0.265*
10.	Level of participation (X_{10})	0.377**	0.268*	0.363**	0.204*
11.	Attitude towards ATMA (X_{11})	0.589**	0.197*	0.590**	0.203*

*significant at 0.05 probability level

4.5 Constraints and suggestions of the respondents regarding participation of ATMA activities:

4.5.1 Constraints faced by ATMA beneficiaries:

The multiple responses were collected to ascertain the problems faced by the ATMA beneficiaries in the participation of different ATMA activities shown in table 4.25. Among the constraints, lack of communication facilities was identified as major constraint reported by highest percentage of respondents (80.83%) and ranked first, followed by poor contact between farmers, agriculture officers & scientist with opinion of 78.33 per cent respondents and ranked in second,inadequate and untimely supply of desired inputs reported by 70.00 per cent respondents and ranked in third,poor financial

condition ranked IV by 66.67 per cent respondents, poor education status of farmers got V rank by65.83 per cent respondents, lack of technical guideline got VI rank by 62.50 per cent respondents, transport problem got VII rank by 51.67% respondents while,lack of proper training on selected topicgot last and VIII rank by 48.33 per cent respondents.

Table 4.25: Distribution of ATMA beneficiaries according to their constraints

S. No.	Constraint	Frequency	Percentage	Rank
1.	Poor education status of farmers	79	65.83	V
2.	Transport problem	62	51.67	VII
3.	Poor financial condition	80	66.67	IV
4.	Lack of proper training on selected topic	58	48.33	VIII
5.	Poor contact between farmers, Agriculture officers and Scientist	94	78.33	II
6.	Inadequate and untimely supply of desired inputs	84	70.00	III
7.	Lack of technical guideline	75	62.50	VI
8.	Lack of communication facilities	97	80.83	I

4.5.2 Suggestions of ATMA beneficiaries for better functioning of ATMA project:

Among the suggestion given by ATMA beneficiaries to overcome the constraints in participation of different ATMA activities presented in Table 4.26 revealed that the majority of beneficiaries (80.83%) were suggested to organize programme in right time and given it first rank. The suggestion on “demonstration should be conduct on farmers field” was identified by 71.67 per cent beneficiaries and got it second rank. The 68.33 per cent beneficiaries were suggested to“information must be provided on proper time” and given it third rank. The 66.67 per cent beneficiaries were given weightage to “regular contact should be made among farmers, agriculture officers and scientist”with forth rank. The 49.17 per cent beneficiaries were given their opinion on “training

should be organized regularly" and got it fifth rank whereas, only 45.00 percent beneficiaries suggested that to provide transportation facilitiesand given it sixth rank.

Table 4.26: Distribution of ATMA beneficiaries according to their suggestions

S. No.	Suggestions	Frequency	Percentage	Rank
1.	Information must be provided on proper time	82	68.33	III
2.	Regular contact should be made among farmers, Agriculture officers and scientist	80	66.67	IV
3.	Programme should be organized in right time	97	80.83	I
4.	Transportation facilities should be provided	54	45.00	VI
5.	Demonstration should be conduct in farmers field	86	71.67	II
6.	Training should be organized regularly	59	49.17	V

Chapter-V

DISCUSSION

This chapter deals with logical discussion on the outcomes of present study for the purpose of clarity the findings have been presented in the following heads:

5.1 Profile of different categories of ATMA beneficiaries.

5.2 Level of knowledge and participation of different categories ofbeneficiaries in different activities before and after implementation of the ATMA project.

5.3 Impact of ATMA project in terms of production and productivity of important crops among the selected respondents.

5.4 Relationship between dependent and Independent variables.

5.5 Constraints and suggestion of the respondents regarding effective participation in the ATMA activities.

5.1: Profile of different categories of ATMA beneficiaries

The results of the present study showed that majority of beneficiaries (67.50%) belonged to middle age group (36-55 year). This finding is supported by Meshram (2003), Dwivedi (2007), Sharma (2009) and Dewagan (2019).

As regards the level of education, most of the beneficiaries (46.66%) found to be educated up to higher secondary level. Similar findings reported by Singh *et al.* (2009).

In case of family size, the maximum number of the beneficiaries (60.00%) had medium size of family. This finding inconformity with findings of Sharma (2009) and Ahirwar (2010).

Regarding occupation, the majority of the beneficiaries (65.83%) were totally depended on farming only. Similar resultsreported by Mahoviya (2006), Paigwar (2006) and Isah*et al*. (2010).

As regards of annual income, the majority of the beneficiaries() belonged from medium category of the annual income (₹300001 to ₹600000). This finding is supported by Patidar (2007).

In case of social participation,most of the beneficiaries (71.00%) were involved in social participation at medium level. This finding is in conformity with the finding of Pawak (2009).

Regarding information seeking behavior, majority of the beneficiaries (57.50%) had belongs from medium category to information seeking behavior. Similar result was also reported by Badodiya (2011).

As concern to scientific orientation, the maximum number of beneficiaries (58.33%) had medium level of scientific orientation. Thisfinding inconformity with Israel (2003), Verna (2005) and Kansana (2008).

As regards to level of knowledge, the majority of the beneficiaries (53.33%) had medium level of knowledge. The study is supported by Kappala (2002), Patel (2008) andPawak (2009).

In case of level of participation, the most of the beneficiaries (60.83%) had medium level of participation in activities of ATMA project. This result is in conformity with the findings of Kappala (2002), Paigwar (2006) and Choudhary (2010).

Regarding attitude towards ATMA,the majority of the beneficiaries' (53.33%) had high attitude towards ATMA programme. Similar result also reported by Kappala (2002).

5.2: Level of knowledge and participation of different categories of beneficiaries in different activities before and after the implementation of ATMA project:

5.2.1 Knowledge of different activities of ATMA project

Regarding the impact of ATMA project on knowledge of different activities it can be concluded that t value found to be significant and there is a difference between level of knowledge of beneficiaries before and after implementation of project. This finding is in line with the finding of Kappala (2002), Patel (2008) and Pawak (2009).

5.2.2 Participation In different activities of ATMA project

The study revealed that both before and after implementation categories had significant difference with respect to participation invarious activities of the

ATMA project. The beneficiaries had more participation level after Implementation of project and maximum number of beneficiaries comes under medium participation group. The t-test found significant difference in participation of the beneficiaries before and after implementation of the project.The finding is in line with the finding of Kappala (2002), Israel (2003) and Palgwar (2006).

5.3 Impact of ATMA in terms of production and productivity of important crops among the selected respondents:

5.3.1 Impact in production

As regard to impact of the project in production of paddy and wheat are found significant difference in production of both the crops under various categories of farmer before and after implementation of the project. It can therefore, be concluded that due to implementation of the ATMA project the production of the paddy and wheat crop was found increased in all categories of beneficiaries before and after the project.

5.3.2 Impact in productivity

In case of productivity, it can be concluded that there was a significant difference in productivity of crops between before and after implementation of the project. It can also be concluded that implementation of the ATMA project has increased the productivity of crops.

5.4 Relationship between dependent and Independent variables

Correlation coefficient (r) was applies to know the relationship between independents and dependent variable and it was found that occupation, annual income, social participation, source of information, mass media contact, scientific orientation, level of knowledge, level of participation and attitude towards ATMA was found significantly and positively correlated with impact in production and productivity of paddy and wheat while its relationship with rest of the independent variables was found non-significant.

5.5 Constraints and suggestion of the respondents in participation of ATMA activities

The major problems reported by the beneficiaries at the end of the project was that lack of communication facility; poor contact between farmers, agriculture officers and scientist; inadequate and untimely supply of desired inputs; poor

financial condition; poor education status of the farmers; lack of technical guideline; Transport problem;and lack of proper training on selected topic.

Suggestion recorded by the beneficiaries

On the basis of findings, following suggestions given by the beneficiaries for making the ATMA project more effective were, organize programme in right time; demonstration should be conduct on farmers field; information must be provided on proper time; regular contact should be made among farmers, agriculture officers and scientist; training should be organized regularly; and provide transportation facilities.

Chapter-VI

SUMMARY, CONCLUSION AND SUGGESTIONS FOR FURTHER WORK

6.1 Summary

The concept of ATMA was introduced in 1999 as an autonomous organization under the National Agricultural Technology Project (NATP) by providing flexible working environment with an objective of Integrating research, extension and all other stake holders at the district level to support the formers needs and interest through an integrated approach of strategic plan. ATMA is a society of key stake holders involved in agricultural activities for sustainable agricultural development in the district. The activities of ATMA are decided and executed by a Governing Board (GB) and Management Committee (MC) of ATMA at district level constituted by the State Govt.

The extension activities under this scheme prepared by a team of technical officers called Block Technology Team (BIT) at block level and are vetted and prioritized by an exclusive team of farmers called Farmers Advisory Committee (FAC) at block level. For effective Implementation of ATMA activities at village level, Farmers Interest Groups (FIGS) and Farmers Organizations are being developed by ATMA operating agencies at village level. The concept of ATMA envisages paradigm shift from 'top down' to 'bottom up' in planning and implementation of agriculture development programmes.

The present study entitled “Impact of Agricultural Technology Management Agency on production and productivity of paddy and wheat crops among different categories of farmers under Gwalior district in Madhya Pradesh” has been undertaken with the following specific objectives:-

1. To study the profile of different categories of ATMA beneficiaries.
2. To determine the level of knowledge and participation of different categories of beneficiaries in different activities before and after the ATMA project.
3. To know the impact of ATMA in terms of production and productivity of important crops among the selected respondents.

4. To determine the relationship between dependent and independent variables.
5. To identify the constraints and suggestion of the respondents in participation of ATMA activities.

Brief methodology

In order to fulfill the above mentioned objectives, study was conducted in the Dabra block of Gwalior district of Madhya Pradesh. Representative samples of 120 beneficiaries were selected for the study spread over 12 villages. The data were collected through a well-structured and pre-tested interview schedule, which was prepared on the basis of objectives of the study. The collected data were tabulated and presented in the form of tables and graphs. After tabulation of the data,analysis process was carried out and percentage, t-test, correlation coefficient was calculated.

6.2 Conclusions

The conclusions of the present study are presented here on the basis of objectives:

1. Profile of selected ATMA beneficiaries

As regards the profile of selected ATMA beneficiaries are concerned; the finding of study can be summarized:

1. The majority of beneficiaries (67.50%) belonged to middle age group (36-55 year).
2. Most of the beneficiaries (46.66%) had educated up to higher secondary level.
3. The majority of the beneficiaries (60.00%) had medium sized family (5-10 members).
4. In case of occupation, majority of the beneficiaries (65.83%) were doing farming only.
5. As regards of annual Income, majority of beneficiaries' (53.33%) had medium annual income (₹300001 to ₹600000).

6. In case of social participation, maximum number of beneficiaries (71.00%) had medium social participation.
7. Regarding information seeking behavior, the maximum beneficiaries (57.50%) had medium level of information seeking behavior.
8. In case of scientific orientation, majority of the beneficiaries (58.33%) had medium scientific orientation.
9. As regards to level of knowledge, majority of the beneficiaries (53.33%) had medium level of knowledge.
10. The majority of the beneficiaries (60.83%) had medium level of participation.
11. In case of attitude towards ATMA, majority of the beneficiaries' (53.33%) had high level of attitude towards ATMA project.

2. Level of knowledge and participation of different categories of beneficiaries in different activities before and after the ATMA project:

Knowledge

The study indicated that both before and after category were significantly differ with respect to knowledge of ATMA project. The beneficiaries had more knowledge after implementation of the project and maximum number of beneficiaries comes under medium knowledge level group.

The t-test found to be significant, thus null hypothesis and results indicating that significant difference in the knowledge of the beneficiaries before and after implementation of the project.

Participation

The study revealed that both before and after implementation categories had significant difference with respect to participation in activities of the ATMA project. The beneficiaries had more participation level after Implementation of project and maximum number of beneficiaries comes under medium participation group.

The t-test found to be significant, thus null hypothesis is rejected, there by indicating, that significant difference in participation of the beneficiaries before and after implementation of the project.

3. Impact of ATMA on production and productivity of important crops

Impact of ATMA on production

The finding regarding to production of the paddy and wheat found that the production of both the crops after implementation of the project had significant difference over the production of paddy and wheat before implementation of the project.The production of the paddy and wheat under all the categories of beneficiaries had increased after implementation of the ATMA project. The t-test found to be significant, thus null hypothesis is rejected and it was confirmed that production of the beneficiaries was significantly differ between before and after implementation of the project.

Impact of ATMA project on productivity

The finding connection to productivity found that both category, before and after implementation of project had significant difference and productivity of the crop of all beneficiaries had significantly increased after implementation of the project. The t-test found to be significant, thus null hypothesis is rejected, there by indicating that the significant difference in productivity of the beneficiaries before and after implementation of the project.

4. Relation between profiles of ATMA beneficiaries with production and productivity:

Significant and positive relationship was found between dependent variables (impact in production and productivity of the crops) and independent variables like occupation, annual income, social participation, information seeking behavior, scientific orientation, level of knowledge, level of participation and attitude towards ATMA.

5. Constraints and suggestion of the respondents regardingof participation in ATMA activities:

The majority of the respondents felt at the end of the project that lack of communication facility; poor contact between farmers, agriculture officers and scientist; inadequate and untimely supply of desired inputs; poor financial condition; poor education status of the farmers;lack of technical guideline; Transport problem;and lack of proper training on selected topic.

Suggestions to make effective ATMA project:

Some Important suggestions made by the beneficiaries for making the ATMA project more effective which were organize programme in right time; demonstration should be conduct on farmers field; information must be provided on proper time;regular contact should be made among farmers, agriculture officers and scientist; training should be organized regularly; and provide transportation facilities.

6.3. Suggestions for further research work:

On the basis of the results and experience gained after the completion of the investigation the following points are suggested for further studies:-

1. The similar study should be also conducted other parts of the state to know the impact of ATMA project.
2. An in-depth study should be conducted to determining the extent of participation of the farmers in planning, execution and effective implementation of the ATMA project.
3. The training needs of the farmers should be assess and also feedback of the trainees should also be taken in to consideration for effective training under the ATMA project.
4. A separate study should be conducted to develop a strategy for effective and desired participation of agriculture extension agencies in the ATMA activities.

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उत्तर दाता क्रमांक.....

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कृषि विस्तार एवं प्रसार शिक्षा विभाग, कृषि महाविद्यालय ग्वालियर (म.प्र.)

शोध का विषयः- ''Impact of Agricultural Technology Management Agency (ATMA) on production of paddy and wheat crops among different categories of farmer under Gwalior district in Madhya Pradesh''.

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साक्षात्कार अनुसूची

शोध अवधि 2019-2020

सामान्य जानकारी	
गांव का नाम	
कृषक का नाम	
विकासखण्ड का नाम	
जिला का नाम	

1.आयु –.....

2. कृपया आप अपनी शैक्षणिक स्तर बताएं :-.....

3. परिवार की संख्या

1) पुरुष	
2) महिलाये	
3) बच्चे	
4) कुल	

4. कृपया व्यवसाय के बारे में बताएं

i. फार्मिंग

ii.फार्मिंग एवं अन्य व्यवसाय

iii.फार्मिंग एवं नौकरी

5. वार्षिकआय .....

6. सामाजिक भागीदारी(Social participation)

i. क्या आप किसी सामाजिक संगठन संस्था या किसी अन्य संस्था के सदस्य या पदाधिकारी हैं ?**हाँ/ नहीं**

ii. यदि हाँ , तो बताये |

क्र.	संस्था का नाम	सदस्यता	सदस्यों की भागीदारी			
			सबसे ज्यादा	हमेशा	कभी कभी	कभी नहीं
1.	ग्राम पंचायत					
2.	सहकारिता संस्था					
3.	सांस्कृतिक संगठन					
4.	ग्राम विकास समिति					
5.	शाला विकास समिति					

7. जानकारी चाहने वाला व्यवहार (information seeking behaviour)

क्र.	**जानकारी का स्रोत**	**संपर्क**			
		सबसे ज्यादा	हमेशा	**कभी कभी**	**कभी नहीं**
	(1)अनौपचारिक स्रोत				
1.	परिवार का सदस्य				
2.	दोस्त				
3.	रिश्तेदार				
4.	पड़ोसी				
5.	प्रगतिशील किसान				
	(2) औपचारिक स्रोत				
1.	ग्राम पंचायत सदस्य				
2.	किसान मित्र				
3.	RAEO/ ADO				
4.	KVK				
5	कृषि महाविद्यालय				
	(3) संचार मीडिया				
1.	समाचार पत्र				
2.	कृषि मेंगजीन				
3.	रेडियो				
4.	T.V.				
5.	किसान कॉल सेंटर				

8. वैज्ञानिक उन्मुखीकरण (Scientific orientation):-

क्र.	कथन	दृढ़तापूर्ण सहमत	सहमत	अनिश्चित	असहमत	दृढ़तापूर्ण असहमत
1.	पुरानी विधियो की अपेक्षा नई विधियों से अच्छे परिणाम प्राप्त होते हैं ।					
2.	किसान के पास अधिक अनुभव होने पर ही उसे नए कृषि विधियों का उपयोग करना चाहिए ।					
3.	यदि नई विद्या सीखने में समय लगता है तो भी उसे उसके लिए प्रयास करना चाहिए ।					
4.	एक अच्छा किसान नई विधियों का प्रयोग कृषि में करता है ।					
5.	किसान के जीवन स्तर में सुधार के लिए परंपरागत खेती की विधियों में परिवर्तन करना आवश्यक है ।					
6.	जिन विधियो से किसानों के पूर्वज खेती करते थे वह आज की अपेक्षा अच्छी थी ।					

9. आपको (ATMA) कार्यक्रम के बारे में कितना ज्ञान है कृपया जानकारी देवें

क्र.	कथन	जानकारी का स्तर (Level of Knowledge)						अंगीकरण का स्तर (Level of participation)					
		पहले			बाद			पहले			बाद		
		पूर्ण	आंशिक	निरंक	पूर्ण	आंशिक	निरंक	पूर्ण	आंशिक	निरंक	पूर्ण	आंशिक	निरंक
	1.कार्यक्रम की योजना बावत												
1.	आत्मा कार्यक्रम आपके क्षेत्र में कब प्रारंभ हुआ? आत्मा कार्यक्रम के मुख्य उद्देश्य क्या क्या है? 1. 2.												
2.	इस कार्यक्रम में किस तरह की जानकारी प्रदान की जाती है? यह किस के विकास हेतु चलाया जा रहा है?												
3.	इस कार्यक्रम के तहत गांव में सामूहिक रूप से कौन-कौन से कार्यक्रम आयोजित किए जाते हैं												
4.	इस कार्यक्रम में किस प्रकार की गतिविधियां है जिसके कारण किसान की आय बढ़ती है												
	2) प्रशिक्षण संबंधी												
1.	क्या इस योजना के अंतर्गत किसी												

	प्रकार के प्रशिक्षण का आयोजन किया जाता है?												
2.	किन-किन विषयों पर प्रशिक्षण दिया जाता है कृपया जानकारी देवें?												
3.	प्रशिक्षण का कार्यक्रम कहां कहां कराया जाता है? समय के बारे में उचित जानकारी दें?												
4.	प्रशिक्षण की कौन सी विधि अपनाई जाती है| कौन सी विधि सबसे अच्छी है कृपया जानकारी देवें|												
5.	प्रशिक्षण कार्यक्रम में प्रशिक्षण किसके द्वारा दिया जाता है कृपया जानकारी देवें|												
	3) प्रदर्शन संबंधी												
1.	इस कार्यक्रम में किस प्रकार के प्रदर्शनी का आयोजन किया जाता है क्या आप को इसकी जानकारी है ?												
2.	किन किन विषयों पर प्रदर्शनी का आयोजन किया जाता है कृपया जानकारी देंवे |												
3.	प्रदर्शन कार्यक्रम के समय के बारे में												

	उचित जानकारी है												
4.	प्रदर्शन की कौन सी विधि अपनाई जाती है प्रदर्शन के लिए कौन सी विधि सबसे अच्छी है कृपया जानकारी देंवे												
5.	इस आयोजन के अंतर्गत प्रदर्शन का आयोजन किस विभाग के द्वारा एवं कहां कराया जाता है कृपया जानकारी देंवे| कराया जाता है|											
6.	प्रदर्शन कार्यक्रम में प्रदर्शन किसके द्वारा दिया जाता है कृपया जानकारी देवें												
	4) क्षेत्र भ्रमण संबंधी												
1.	क्या इस कार्यक्रम में प्रक्षेत्र भ्रमण की व्यवस्था की जानकारी है?												
2.	प्रक्षेत्र भ्रमण के लिए कहां कहां ले जाया जाता है कृपया जानकारी देवें												
3.	प्रक्षेत्र भ्रमण के दौरान किस प्रकार की सुविधाएं प्रदान की जाती है												
	5. अन्य												
1.	इस कार्यक्रम के किसान मेला के आयोजन की जानकारी है												

2.	इस कार्यक्रम के अंतर्गत जिला स्तरीय किसानों एवं वैज्ञानिकों के बीच कृषि संबंधित विचारों का आदान प्रदान किया जाता है क्या आपको इसकी जानकारी है हां /नहीं यदि हां तो कृपया विवरण दें												
3.	इस कार्यक्रम के अंतर्गत प्रगतिशील किसानों को दिए जाने वाले पुरस्कारों के बारे में आपको जानकारी है हां/ नहीं यदि हां तो कृपया विवरण दें												
4.	कार्यक्रम के अंतर्गत बनाए जाने वाले प्रगतिशील किसान समूह के बारे में क्या आपको जानकारी है हां/ नहीं यदि हां तो कृपया विवरण दें												
5.	इस कार्यक्रम के अंतर्गत चलाए जाने वाले किसान स्कूल के बारे में क्या आपको जानकारी है हां/ नहीं यदि हां तो कृपया विवरण दें												

10. **ATMA परियोजना के प्रति किसानों की अवधारण**

क्रं.	कथन	उत्तर				
		दृढ़तापूर्ण सहमत	सहमत	अनिश्चित	असहमत	दृढ़तापूर्ण असहमत
1.	क्या आपको लगता है कि हायब्रिड बीज से होनें वाला उत्पादन पारम्परिक बीज से ज्यादा है।					
2.	क्या ATMA परियोजना के द्वारा प्राप्त उत्पादन तकनीकि से आपके उत्पादन में वृद्धि हुई है।					
3.	जो पोषक तत्व ATMA परियोजना के द्वारा आपको दिये गये हैं उसके उपयोग से फसल उत्पादन में वृद्धि हुई है।					
4.	ATMA के द्वारा दिये गये जैविक फफूँदीनाशकों से बीजोप्चार करनें से फसलों में रोगों में कमी आई है।					
5.	ATMA के द्वारा दिये गये कीटनाशकों के उपयोग से आपकी फसल को लाभ हुआ है।					
6.	क्या आप जैविक खाद के उपयोग को सरल एवं अच्छा समझते हैं।					
7.	ATMA परियोजना में किसानों की समस्या का समाधान कार्यकर्ताओं द्वारा सही रूप एवं समय पर किया गया है।					
8.	ATMA परियोजना के द्वारा दी गई उत्पादन तकनीकि प्रदर्शन से आपका ज्ञान स्तर बढ़ा है।					
9.	ATMA विस्तार कार्यकर्ता के द्वारा दी गई सिफारिश को आपनें तुरंत अपनाया।					
10.	ATMA परियोजना के द्वारा किसानों की समस्या का जो भी समाधान होता है वह अनुसंधान पर आधारित होता है।					

11.कृषि तकनीकी प्रबंधक शाखा (ATMA) का फसल के उत्पादन एवं उत्पादकता पर प्रभाव

क्र.	फसल का नाम	उत्पादन		उत्पादकता	
		योजना से पूर्व	योजना के बाद	योजना से पूर्व	योजना के बाद
1.	गेहूं				
2.	धान				

12. ATMA के अंतर्गत किसानों को होने वाली समस्याएं

13. कृषि तकनीकी प्रबंधक शाखा (ATMA) को और अधिक प्रभावशाली बनाने के लिए आपके क्या सुझाव है

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VITA

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Class	Board/ University	Subjects	Year	Percentage
High School	M.P. Board	All subjects	2009	55.16 %
Higher secondary	M.P. Board	Math	2011	76.6 %
B.Sc. (Ag.)	RVSKVV, Gwalior	Agriculture	2018	6.72 %
M.Sc. (Ag.)	RVSKVV, Gwalior	Agricultural extension and communication	2021	65.8 %

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