International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Empowering Women Through Agricultural Technology: Evidence from Agricultural Technology Management Agency (Atma) in Mayurbhanj District

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ABSTRACT
The Agricultural Technology Management Agency (ATMA) was introduced in India to decentralize agricultural extension services and make them more participatory, demand driven and farmer centric. In Odisha and particularly in the tribal dominated district of Mayurbhanj, Women farmers play a vital role in agricultural activities. However, they often face systematic barriers to accessing new technologies, institutional support and training. This study aims to evaluate the impact of ATMA on the knowledge enhancement and adoption of modern agricultural practices among Women farmers in Mayurbhanj district. Using a sample of 200 beneficiaries selected through a multi stage sampling technique, primary data were collected through structured interviews, focus group discussions and key informant interviews. The findings reveal a significant improvement in awareness and adoption of modern technologies such as improved seed varieties, Fertilizer and pesticide use and disease control. Despite these gains challenges such as limited access to credit, socio-cultural constraints and lack of gender-specific training modules continue to hinder full participation and benefit realization.

Keywords: ATMA, Extension, Adoption of new technology, Impact factor, Extension strategy, Demonstration, Women farmers, Knowledge disseminations, Modern Farm practices.

INTRODUCTION

Agriculture is the backbone of Odisha's economy, engaging more than 60 % of its population, within this sector, the role of Women farmers is crucial, they actively participate in crop production, animal husbandry, and post harvest operations. However despite their significant contribution, they often remain excluded from institutional support access to technology and decision making in agricultural development.

To address these gaps, the Agricultural Technology Management Agency (ATMA) was introduced as a part of the National Agricultural Technology project (NATP) aiming to decentralize extension services and promote farmer centric participatory and demand driven approaches. Organization of training programmes for Women farmers and other stakeholders is one of the most important activities of

ATMA. Training is vital and essential to induce motivation, create confidence and increase the efficiency of a farmer. It is a process by which desire, ideas, positive attitude, Knowledge and skills are inculcated and reinforced. In Odisha, ATMA has emerged as a key agency for improving the quality of agricultural extension services by integrating research institutions, extension agencies, NGOs and farmer organizations.

In Mayurbhanj district, which is one of the largest and most tribal dominated districts of Odisha, agriculture is the primary livelihood for a majority of the rural population, Women in Mayurbhanj play a vital role in agricultural operations, especially among small and marginal farming households. The implementation of ATMA in this district has sought to empower Women farmers by introducing modern technologies, promoting farmer integrate group (FIGS) and organizing training, field demonstration and exposure visits, importantly, ATMA has focused on bringing Women farmers in to the mainstream by encouraging their participation in Self-Help Groups(SHGs), capacity building programs and technology dissemination initiatives.

Despite these efforts, the impact of ATMA on Women farmers in Mayurbhanj varies due to factors such as socio cultural norms and limited access to land and credit. This study aims to assess how effectively ATMA has influenced the knowledge, adoption of behavior and empowerment of Women farmers on Mayurbhanj and to identify challenges and opportunities for strengthening gender responsive agricultural extension in the region.

OBJECTIVE

To study the impact of ATMA on the knowledge of women farmers regarding modern farm technology and its adoption.

METHODOLOGY

The study covers four blocks of Mayurbhanj district like Shyamakhunta, Bangiriposi, Betnoti and Khunta.Out of these blocks ten ATMA adopted villages have been selected purposively from each block and from each selected village again five ATMA beneficiary Women farmers have been selected. So total 200 beneficiaries has taken for the study. The study was conducted through pre tested semi structured interview schedule. The quality of the organization was measured with parameters. The parameters were timely, need based, low cost, accurate, applicable, effective and diverse. These parameters were assigned with three-point scale that were always, sometimes and never with the assigned score 2, 1 & 0 respectively.

FINDING AND ANALYSIS

Table-1- Quality of Service provided by ATMA according to ATMA Women beneficiaries
Respondents-200

Sl.No	Q-P	Always (2)	Sometimes (1)	Never (0)
1	Timely	111(55.5)	86(43)	3(1.5)
2	Need based	87(43.5)	107(53.5)	6(3)
3	Low cost	149(74.5)	41(20.5)	10(5)
4	Accurate	81(40.5)	113(56.5)	6(3)
5	Applicable	73(36.5)	117(58.3)	10(5)

6	Effective	63(31.5)	111(55.5)	26(13)
7	Diverse	61(30.5)	117(58.5)	22(11)

(Q-P- Quality parameters; Figures in brackets indicating percentage.)

Majority of the beneficiaries were not fully satisfied with quality service provided by ATMA. More than half of the beneficiaries felt that the ATMA services was partially applicable and not always need based, not always diverse, sometimes ineffective and sometimes inaccurate but about three forth of the beneficiaries revealed that the services provided by ATMA was low cost. The ATMA Governing body decides the type of service given in which year and in which block according to the need of the Women farmer. So, the Women farmers were getting need based, diverse services from ATMA. ATMA forms different Women farmer groups to provide diverse of services.

AWARENESS ABOUT ATMA INSTITUTION

Since ATMA was a new concept for the research scientists, extension functionaries as well as mass Women farmers it took long time in generating adequate awareness, especially among Women farmers. In view of utmost pertinence of such awareness, the impact study attempted to ascertain the level of awareness about ATMA and it's different constituents. Awareness level of Women farmers was classified in to five categories, viz. good, fair, coverage, poor and nil. On the basis of awareness level Women farmers were regrouped in to aware and not aware. While aware include, the Women farmers having good, fair or average awareness about ATMA institution, while the not aware group comprises of those Women farmers who were either unaware or had only poor knowledge of such institutions. The percentage of Women farmers about ATMA is given in the following table-2.

Table-2- Women farmers of the Sample Blocks aware about ATMA institutions in percentage

Blocks	ATMA	ATMA Governing Board	ATMA Management Committee	Block Technology Team	Women farmer Advisory committee
Betnoti	100	42	40	71	74
Shymakhunta	100	21	34	68	64
Kuliana	99	35	32	72	73
Bangiriposi	99	38	34	64	69
Overall	99.5	34	35	68.75	70

(The information presented in the above table reveals that majority of sample Women farmers of these four blocks were aware about Agricultural Technology management Agency as such, BTT and FAC. However lesser Women farmers were aware about the ATMA GB and AMC.)

DIVERSIFICATION OF FARMING SYSTEM

In ATMA's field program activities the major emphasis was laid on diversification of the farming as a strategy for risk management and sustainable income for the Women farmers. Women farmers were motivated and trained through training, exposure visits to successful sites. Within and out of state and suitable demonstrations on the latest technology and practices. Table-3 reveals that existing farming systems were diversified by inclusion of animal husbandry / dairy, horticulture, fisheries, goat rearing, poultry and bee keeping.

Table-3–Inclusion of new enterprises in the farming system

Sample Blocks				
New enterprise	**Betnoti**	**Shymakhunta**	**Kuliana**	**Bangiriposi**
Dairy/Animal husbandry	22.34	18.39	28.12	31.14
Horticulture	4.8	3.24	2.18	Nil
Fisheries/Duckery	5.46	2.38	4.48	3.92
Pig/Goat/Sheep rearing	6.71	4.28	2.24	2.21
Poultry	17.29	22.20	18.21	15.51
Bee keeping	3.42	4.51	2.31	2.24
Floriculture	1.21	Nil	Nil	2.41
Vegetable Cultivation	12.51	28.24	14.26	14.41
Oil seeds	14.74	18.57	12.48	10.47
Vermi Compost	2.43	Nil	1.52	Nil

(Figures in percentage of adoption Women farmers)

ADOPTION OF NEW TECHNOLOGIES / PRACTICES

ATMA Mayurbhanj put ample efforts in promoting sustainability enhancing and environment friendly technologies as well as latest improved farm practices. Some of these include integrated pest management, integrated nutrient management, Inter cropping, Mixed cropping, Organic farming, Green manuring, Seed treatment, Line sowing, Summer ploughing, Drip /Sprinkler irrigation, Vermi compost use, Bio-fertilizers, Poly house technology, etc. A number of training programmes and exposure visits for Women farmers were conducted through ATMA initiatives to promote these technologies and practices.

Table-4–Women farmers adopting improved technologies (as percentage of targeted Women farmers)

Improved Technological Practices	**ATMA Selected Blocks**			
	Betnoti	**Shymakhunta**	**Kuliana**	**Bangiriposi**
Paddy Production	41.24	53.24	43.24	40.21
Pulses Production	4.23	8.51	Nil	Nil
Oil-Seed Production	1.23	2.15	Nil	Nil
Vegetable Production	12.25	14.53	6.91	5.52
Adoption of HYV	68.29	70.51	56.39	58.21
Fertilizer and Pesticide use	71.41	67.53	62.57	59.48
IPM in Paddy	12.39	8.51	9.27	11.31
Use of FYM	7.96	6.39	8.24	4.36
Disease Control	4.95	8.34	7.23	6.41
Use of green manure	2.12	Nil	4.32	1.61

(Figures in adopting Women farmers as percentage of Women farmers targeted)

ADOPTION BY FARM SIZE CLASS

As mentioned earlier, ATMA's carried out diverse field program activities including Women farmers

training, exposure visits and demonstration on varied subjects/ topics. The impact assessment study has assessed the adoption ratio for various technologies / practices propagated through trainings, exposure visit and demonstrations. The adoption ratio was observed to be the highest among large Women farmers (73.89) followed by small and marginal Women farmers (62.42 & 60.02) respectively. In Shymakhunta and Betnoti blocks all the Women farmers contacted through this study had received some kind of training (100 %). While in Kuliana and Bangiriposi the figure was (80%) of the sample (Table-4).

Table-5 Adoption ratio of various training programs / exposure visits by ATMA in sample blocks

Adoption ratio of various training programs and farm practices				
Blocks	**Marginal Women farmers**	**Small Women farmers**	**Large Women farmers**	**Overall**
Betnoti	54.36	64.58	78.27	65.73
Shyamakhunta	66.94	68.56	81.72	72.40
Kuliana	58.28	57.43	70.24	61.98
Bangiriposi	60.52	59.12	65.33	61.65
Overall	60.02	62.42	73.89	66.70
Adoption ratio of technologies / farm practices through exposure visits				
Blocks	**Marginal Women farmers**	**Small Women farmers**	**Large Women farmers**	**Overall**
Betnoti	24.32	32.56	52.68	36.52
Shyamakhunta	38.39	50	68.36	52.21
Kuliana	12.33	36.51	47.45	32.09
Bangiriposi	30.41	38.33	51.31	40.16
Overall	26.36	39.35	54.95	40.22

(Figures in adopting Women farmers as percentage of Women farmers targeted)

In addition to training programmes, exposure visits were also organized for the interested Women farmers. During such exposure visits Women farmers could learn new enterprises and farm practices. In general around 40.22 percentages of the Women farmers adopted new farm practices and new enterprises. However 54.95 percentages of the resource rich Women farmers could get more benefit from such exposure visits than the resource poor Women farmer 26.36 percentage.

DEMONSTRATIONS

Table-6 Adoption of various techniques and practices demonstrated by ATMA in sample blocks

Adoption ratio of various techniques and practices through demonstration				
Blocks	**Marginal Women farmers**	**Small Women farmers**	**Large Women farmers**	**Over all**
Betnoti	18.51	26.48	48.82	31.27
Shyamakhunta	32.36	41.36	61.54	45.08
Kuliana	24.78	32.42	45.38	34.19

Bangiriposi	12.32	29.18	44.57	28.90
Overall	21.99	32.36	50.07	35.16

(Figures in adopting Women farmers as percentage of targeted Women farmers)

Various demonstrations were organized by ATMA-Mayurbhanj to familiarize the Women farmers about the new techniques and practices. Table 6 indicates that it was very effective and about 35.16 percent Women farmers adopted the techniques demonstrated by the ATMA officials. However, in different sample blocks there was a sharp difference in the adoption of these demonstrations by different categories of the Women farmers. These demonstrations could encourage the poor small Women farmers in adopting the new techniques and practices demonstrated by the ATMA authorities.

CONCLUSION

The Agricultural Technology Management Agency (ATMA) has emerged as a key institutional mechanism for revitalizing agricultural extension services in India. In the context of Mayurbhanj district, where agriculture is a primary livelihood and women play a central role in farming activities. ATMA has shown promising potential in bridging the gap between technology dissemination and its practical adoption by Women farmers. The findings of the study reveal that ATMA has contributed significantly to increasing awareness and knowledge among Women farmers regarding modern agricultural practices such as improved seed varieties, organic farming integrated pest management. A noticeable shift in the adoption of these practices was observed among the women, who actively participated in ATMA programs, training sessions and group based activities.

The results clearly demonstrate that there has been improvement in the extension system and Women farmers have taken keen initiatives in the development process leading to their empowerment. The Women farmers' response was found to be quite encouraging. Scientist have become more responsive to the needs of the Women farmers and have sharpened their focus of research to meet the location specific requirement of the Women farmers of different size groups .ATMA provides low cost services followed by timely, need based and accurate service to the Women farmers of Mayurbhanj district. The study recommended that the service provided by ATMA should give more emphasis on diverse areas of agriculture and should be more effective.

Beyond knowledge and adoption, ATMA interventions have also played a role in empowering women economically and socially. By facilitating their participation in Self Help Groups (SHGs), Women farmers Interest Groups (FIGs) and Capacity building activities, the program has enhanced their confidence, decision making ability and community engagement.

However, the study also highlights persistent challenges such as inadequate outreach in remote areas, limited access to credit and cultural constraints that hinder full participation of women in extension services. Many women remain on the margins due to factors like illiteracy, lack of land ownership and male dominated extension system.

In conclusion, ATMA has laid a strong foundation for transforming Women farmers into knowledgeable and empowered stakeholders in agriculture, with focused policy support and participatory planning; its impact can be further deepened, leading to sustainable agricultural growth and gender equity in rural Odisha.

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