

# Study of Effective Implementation of Agricultural Technology Management Agency through Case Studies in Bihar

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## Abstract

The present study was formulated to document the successful and unsuccessful cases of implementation of Strategic Research and Extension Plan under ATMA in Bihar to identify the important lessons in terms of facilitating and hindering factors for success in agri-entrepreneurship. Study was undertaken in Patna and Muzaffarpur districts of Bihar. From these districts, two Farmers Interest Groups and two individual farmers were purposively selected as per discussion with ATMA officials for in-depth study. The data were collected from selected farmers and farm women through personal interview and focused group discussion. Three successful and one unsuccessful case were documented. After analyzing the successful cases it was found that 'formation of commodity specific farmers group', 'providing training and exposure visit to these farmers on new enterprises such as cultivation of high value vegetable crops, mushroom cultivation and bee keeping', 'providing them technical as well as financial support through banks' and 'helping them market their produce' were the major factors which contributed to the success of individual or farmer's group. It was also found that linkage of farmers with KVK scientists, BTT members, ATMA officials at district level and officers of agriculture/horticulture departments were crucial to the success of individual farmers/farmers group.

## Highlights

- Mobilization of farmers and farm women into FIGs/SHGs, providing them training on new technology and promoting them to start their own agri-enterprise has started to pay rich dividends.
- Bee keeping and mushroom cultivation also turned out as potential ventures to get supplementary income throughout the year

**Keywords:** Agricultural Technology Management Agency (ATMA), Farmers Interest Groups (FIGs), Self Help Groups (SHGs), case study

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## Introduction

Extension system in India has changed in India after the implementation of ATMA scheme throughout India. The new institutional arrangement focused on bottom up approach in planning and decision making (Reddy *et al.*, 2004). Farmers are now participating in planning as well as implementation of extension and research strategies at district level. Training and capacity building is integral part of ATMA scheme and many farmers and FIGs/SHGs were

provided training, demonstrations and exposure visit on improved agricultural technologies and new agri-enterprises. Some farmers who are more innovative than others try to adopt new technologies and start new enterprises after getting trained in a particular aspect. Some of them became very successful and others fail. Singh (2009) in his study of impact of ATMA in Bihar observed that 26.2 to 28.9 per cent of farmers in project districts adopted vegetable production technology. He also pointed out that adoption of new technologies in project districts resulted in increase

in crop yield to the extent of 13 per cent and increase in farm income by 14 per cent. Singh and Swanson (2006) reported that the medicinal and aromatic plants cultivation under ATMA in Patna district which started with growing Vinca Rosa by five Farmers Interest Groups in 2000 had spread to a network of 50 FIGs. Therefore, it can be observed that ATMA scheme is providing opportunity to farmers to start new enterprises through its diversification strategy. Many farmers adopted new technology and started small scale agricultural enterprises due to interventions under ATMA implementation. So, a careful analysis of the factors responsible for the success of these farmers is necessary. If these factors are documented and analysed carefully, it would give some insight and can be applied to other farmers' situation. Documentation of strategies followed by the farmers and their management techniques would be highly useful for other farmers. Hence the present study was formulated to document the successful cases in implementation of SREP-ATMA.

### Materials and Methods

Cases of success were identified and studied by using case study method in order to draw lessons from ATMA implementation. Farmers and other stakeholders were interviewed and secondary source of information were also collected for this purpose. This research was undertaken in Patna and Muzaffarpur districts of Bihar where ATMA was implemented under the pilot project of NATP. Two blocks from each district were selected through random sampling technique. A total of 160 farmers were selected through simple random sampling technique and out of these, two FIGs and one individual farmer was purposively selected for this study. In-depth discussions, personal interview and observation methods were employed for data collection. An ex-post facto research design was used. Three successful cases were documented.

### Results and Discussion

Two farmers group, namely 'Pragatisheel Kisan Club', Chaknawada and 'Poonam Mahila Mandal' from Barh block of Patna were identified for this study. Along with these farmers group, one individual farmer who started new enterprises on bee keeping was also studied in depth. Thus three cases were selected for this study. Results and discussions for each case is presented in details under the headings of 'background', 'problem', 'intervention and process', 'benefits and impact' and finally 'lessons learnt'. The cases are as follows:

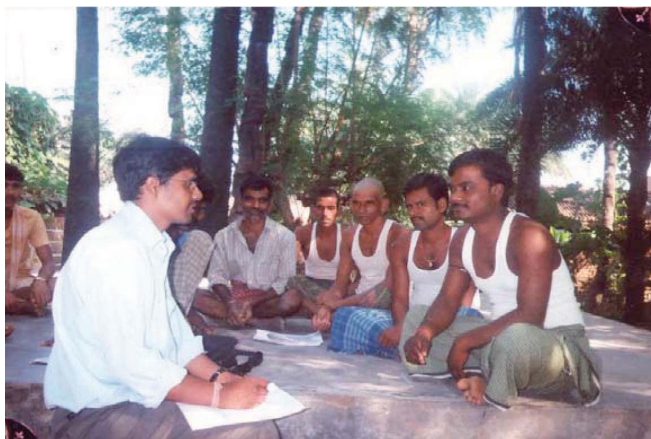
### Case I: Community vegetable farming: A boon for farmers

**Background:** The horticulture sector, such as cultivation of fruits, vegetables flowers, roots and tuber crops, mushroom, medicinal and aromatic plants, has a great potential in Bihar. The fertile land near the banks of holy river Ganges in Barh block of Patna district offers a range of opportunity to farmers to grow horticultural crops especially seasonal vegetables. Moreover, vegetable cultivation is a highly remunerative agricultural enterprise. Vegetables give higher return/ha as compared to cereals like rice, wheat etc.

Chaknawada is a small village in Barh block of Patna district and located near the banks of river Ganges. More than 90 per cent of the village population depends on agriculture sector for their livelihood. There is assured irrigation for crops and therefore, farmers are mostly growing vegetables in their field. The major vegetable crops of this region are potato, onion, cauliflower, cabbage, chilli, tomato, pea, carrot and radish.

**Problem:** Vegetable farming is an input driven agricultural enterprise and requires timely and sufficient application of good quality seeds, fertilizers, pesticides etc. Farmers used to practice traditional farming of vegetables due to lack of knowledge regarding high yielding vegetable varieties and modern cultivation practices resulting in lower yield. Moreover, farmers of Chaknawada village had small plots and they were not financially strong. Therefore, they used to take money from private moneylenders at a high interest rate for farm related expenses. Many times, despite getting good yield of vegetables and thereby earning high income, most of their earning went in paying interest to money lenders.

**Intervention and process:** Dr. Umesh Singh, a scientist from Krishi Vigyan Kendra, Agwanpur, Patna, visited Chaknawada village and advised farmers to form a Farmers Interest Group (FIG). So, twelve small farmers of this village formed a FIG named 'Pragatisheel Kisan Club', Chaknawada in July, 2002. This club opened a joint account in State Bank of India, Barh in December, 2002 and started to deposit Rs 10 per member per month. This club was not very active and struggled to get loan from bank for vegetable farming for few years. In the year 2004, this FIG was registered in Agricultural Technology Management Agency (ATMA), Patna. Farmers Advisory Committee of Barh block suggested training cum exposure visit of vegetable cultivation for farmers at district level KVK,



**Plate 1:** Group discussion with FIG members



**Plate 2:** Cabbage cultivation under community vegetable farming

Agwanpur, and at Indian Institute of Vegetable Research (IIVR), Varanasi. Since, marketing of vegetables was not a problem in a city like Patna, the proposal was discussed by ATMA management committee and they decided to send some members of this FIG for training and exposure visit regarding new varieties of different vegetables and modern technology in vegetable farming practices at IIVR, Varanasi. The members learnt a lot from this training and they decided to go for cooperative vegetable farming. Shree Dilip Kumar took a lead in this process and met in-charge Block Technology Team (BTT) and Project Director, ATMA for further guidance. This FIG 'Pragatisheel Kisan Club', Chaknawada, was now active in seeking loan from bank. They faced a lot of problems in securing loan from SBI, Barh but were helped by ATMA functionaries in getting a loan from Madhya Bihar Gramin Bank, Bedhna, Barh. So, this group took land of 0.22 acre on lease and decided to grow onions. Block Technology Team provided regular

technical support to club members and helped them in commercial vegetable cultivation.

**Benefits and impact:** On the leased land of 0.22 acres of land, onions were grown by this FIG and due to technical support provided by ATMA and good weather conditions, there was bumper production of onion crop which resulted in 60 tonnes of production from only 0.22 acre land. A total of Rs 1,30,000/- was invested in this venture. After storage for few months, onions were sold in Silliguri and Dalgora mandis of West Bengal state. There was a gross income of Rs 4,00,000/- and after deducting the investment the club got a total benefit of Rs 2,70,000/-. Thus, this twelve member FIG earned a healthy profit of Rs 22,500/ member in one season.

Later on, the Pragatisheel Kisan Club started to grow cauliflower, chilli, carrot in rabi and onion in Kharif season. Currently, the club has taken 25 acre land on lease and grows all kinds of vegetables. They rotated the money generated by selling vegetables and continued with the practice of commercial vegetable farming. The club has already paid its loan to bank and now has more than Rs 5 lakh in their joint account. Many local newspapers covered the success story of this FIG and this club emerged as a role model to other farmers of the region.

#### Lessons learnt

1. Need and demand based interventions to farmers by institutional mechanisms like ATMA and KVK lead to prosperity of farming community.
2. Commercial vegetable cultivation is a highly remunerative enterprise in Patna district.
3. Training farmers on modern cultivation practices is crucial to their success as a farmer.
4. Exposure visits also facilitate in initializing profitable enterprises.
5. Farmers can be motivated for adopting improved technologies provided they are relevant and profitable.
6. Microcredit/loan support coupled with training in modern technologies leads to higher profitability.
7. Marketing is not a problem in urban area where there is high demand for vegetables and there are storage facilities, so that the produce can be sold at right time for higher profit.
8. Farmers Interest Groups (FIGs)/commodity groups





are effective approaches for small farmers, especially in marketing the produce. FIGs/Farmers club can be more beneficial than individual farming, especially in case of small farmers.

## Case II: Bee keeping: A worthy agri-enterprise for rural youth

**Background:** Muzaffarpur district lies on the great Indo-Gangetic plains of Bihar. The area around Muzaffarpur is largely agricultural. The principal crops are rice, wheat, pulses, jute, maize and oil seeds. Rice, wheat and maize account for most of the area under cultivation. It is famous for the delicious *litchis* which are exported to other parts of the country and even abroad. Therefore it is also known as “*Land of litchi*”.

Bochaha is one of the blocks in this district where agriculture and livestock are the major source of livelihood of people. There are many *litchi* fruit orchards in Bochaha and nearby villages. Some people from outside used to do bee keeping in the village due to availability of litchi orchard since honey bees collect nectar from flowers in these orchards.

**Problem:** A small poor family of five people, parents and their three children were living in Patiyasa village of Bochaha block. Father, Janardan Singh was a labourer and used to work in agricultural field for earning livelihood for his family. His 16 year old daughter, Anita Kushwaha wanted to go to college, but due to money problem, it was not possible. Also she wanted to support her father. She had a keen interest in bee keeping business but due to lack of proper guidance, it was not possible for her to start it by her own.

**Intervention and process:** In the year 2004-05, Block Technology Team (BTT) of ATMA, Muzaffarpur visited this village and came to know about the interest of Anita Kushwaha about bee keeping. Due to large area under litchi cultivation in Muzaffarpur, Management Committee members of ATMA, Muzaffarpur were keen to promote apiculture as an enterprise for self-employment in the district. When BTT members raised the issue of bee keeping as a potential tool for self employment in Bochaha block, Management committee was ready to send interested farmers to Rajendra Agriculture University (RAU), Pusa, Samastipur for training in bee keeping or apiculture. Therefore, Anita was sent to RAU, Pusa to get training in bee keeping by ATMA, Muzaffarpur. She learnt many important facets of apiculture such as how to raise honey bee, what food should be given, what care should be taken

etc. This training motivated her and gave impetus to her interest of starting a small scale business of bee keeping and getting supplementary income for her family by sale of honey. Her parents supported her in this endeavor and she started bee keeping business at a small scale initially.

**Benefits and impact:** Anita started bee keeping with a small investment of Rs 5000. She purchased two boxes and two queen bees for Rs 4000/- and the rest amount of Rs 1000/- was invested in preparation of sugar syrup. During the month of February, flowering occurs in *litchi* tree. She kept the boxes near *litchi* tree in the village and in first year itself she got very high production of honey. Each box gave 15 kg honey and bee population also increased considerably. After selling this honey in market she got high profit and purchased two more boxes. With regular support from block technology team, she started to expand her business. Anita and her mother Rekha Devi got trained in bee keeping in Rajendra Agricultural University (RAU), Pusa, Samastipur with the help of ATMA. Currently, the whole family of Anita Kushwaha is engaged in bee-keeping business.

Now, Anita owns more than 250 boxes and does this business around the year. In March-April, flowering in litchi crop in Muzaffarpur supports her business. During May-June, the boxes were sent to nearby district Purnia where sunflower cultivation was the source of nectar for honey bees. During October-November, she sends these boxes to Madhya Pradesh where flowering in Mustard crop was the source of nectar for honey bees. So, currently this family earns a net income of Rs 2 lakh per annum from bee keeping. Subsequently, she was rewarded by Bihar Agricultural Management, Extension and Training Institute, Patna, Bihar for her phenomenal achievement. A young lady of a small village has become a role model for other youths of the district. After seeing the success of Anita, many other people got inspired and have started apiculture. ATMA, Muzaffarpur helped her in many ways and thus was crucial in the success of Anita Kushwaha, a budding entrepreneur.

### Lessons learnt

1. Bee keeping is a highly profitable agricultural enterprise and suitable for self employment for men and women because of its low initial cost.
2. If a budding entrepreneur is interested in some business, is supported by Government organization by providing technical and financial guidance, can

be very successful in his/her business.

3. Poor rural women in remote villages can be motivated, trained and supported to become agri-entrepreneurs
4. Bee keeping can be tried as an enterprise wherever opportunities are available.
5. Training on a relevant, need based area provides detail knowledge and skill about it and thus converts interest into action process.
6. It is important to identify motivated youth including women in agriculture and support them through institutions like ATMA, KVKs etc.

### Case III: Mushroom cultivation as a profitable venture for farm women

**Background:** In a country like India, more than 80 per cent of agricultural land is cultivated by small and marginal farmers. Due to fast pace of urbanization, land holding will further decrease. So, adoption of improved agricultural technologies is prerequisite for development of farming community. Know-how of the crop is also required that can flourish best under the existing environmental conditions. After agro-ecosystem analysis through participatory rural appraisal (PRA) exercises taken up by the ATMA team, mushroom cultivation was identified as one of the most suitable small scale enterprise in rural areas of Patna district. Mushroom has now been recognised universally as a nutritive food and is grown in many parts of Bihar on a commercial scale. Mushrooms are very much in demand but their availability is generally restricted to 2-

3 months, i.e. July- September. Generally, three to four species of mushroom have been brought under cultivation, namely paddy & wheat straw mushroom (*Volvariella volvacea*) *Dhingiri* (*Pleurotus Sps*), button mushroom (*Agaricus bispourus*) and milk mushroom (*Calocuba indica*).

**Problem:** Budhnichak is a small village located in Barh block of district Patna. Poonam Devi, a marginal women farmer of this village, had a small land holding on which she used to cultivate vegetable crops like cabbage, cauliflower, chilli and pea. There were many other women farmers who were struggling to earn their livelihood from agriculture. Their main problem was lack of financial resources to start any business and limited agricultural land.

**Intervention and process:** The Farmers Advisory Committee of Barh block discussed this problem in ATMA management committee meeting. Keeping in view the very small size of land holding in the village and the importance of mushroom cultivation as a subsidiary enterprise as well as its nutrition aspects, it was decided to introduce improved methods of mushroom cultivation in Budhnichak village to provide a source of gainful employment to the needy. The Project Director visited this village and contacted women farmers who were equally interested to take this new venture. So, twelve women farmers formed a self help group called *Poonam Mahila Mandal* in the year 2007 with the help of ATMA, Patna. They were provided training on mushroom cultivation technology by scientists from KVK, Agwanpur. After successful completion of the training programme, they were given spawn initially by KVK to start mushroom enterprise on their own.



**Plate 3:** Members of Poonam Mahila Mandal showing paddy straw mushroom



**Benefits and impact:** The SHG *Poonam Mahila Mandal* started with 15 beds of mushroom cultivation, after being demonstrated by block technology team (BTT) members. Later on, they continued mushroom cultivation on their own and expanded its cultivation with 60-80 beds per cycle per person. On an average, additional employment opportunities of 10 man days per month were generated due to this intervention. With one bottle of spawn including other materials and technical support, one women farmer received Rs 150 through production of 3.5 kg of mushroom in three flashes sold @ Rs 45/kg. The greatest advantage was that by sparing hardly 2-3 hours per day, these women farmers were able to earn substantially upto Rs 2500 per month. The sale of harvested mushroom was not a problem for this mahila mandal because the village was near to Patna which has a high demand for mushroom. Marketing support to this SHG was initially provided by ATMA officials but later on they became self sustainable in both production as well as marketing of mushroom. The most eye-catching aspect of this venture was that it required less time and less drudgery but provided rich dividends.

#### Lessons learnt

1. Mushroom cultivation as an enterprise requires less time and investment, but is much more paying than other agricultural enterprises.
2. The availability of paddy and wheat straw, which is a prerequisite for the enterprise, is in abundance as a by-product of the existing farming system and thus can be used efficiently.
3. Providing training and technical support to women farmers can help them in entering into new ventures having higher profitability
4. Involvement of FAC members in encouraging groups to take up mushroom cultivation contributed significantly towards boosting the confidence of the women farmers.
5. The participation of more SHGs in these kinds of activities will bring in economic stability to the region by reducing the over-dependence on the major crop yield.
6. Mushroom cultivation being a less painstaking enterprise, can serve as a gainful source of employment for the women farmers of the region.

#### Conclusion

ATMA is now being implemented in almost all the developmental districts of Bihar. It can be observed that strategies followed under ATMA such as mobilization of farmers and farm women into FIGs/SHGs, providing them training on new technology and promoting them to start their own agri-enterprise has started to pay rich dividends. Community farming is a very innovative concept which should be followed in other areas also. Bee keeping and mushroom cultivation also turned out as potential ventures to get supplementary income throughout the year. It can be noted that farmers must be provided training for entrepreneurship development in order to get them maximum benefits. Therefore, it can be observed that adoption of right technologies at right time and right place is absolutely necessary for success. Study and documentation of strategies followed, interventions, impact of interventions and factors responsible for success of farmer/farmer's group through these cases will be helpful for the researcher, developmental workers and policy makers for further validation and dissemination.

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