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Public Private Partnership in Agricultural Extension Management: Experiences of ATMA Model in Bihar and India

K.M.Singh[1]

Introduction

India's agricultural extension system is at a pivotal point in its evolution. Since independence, the extension system has focused on four major strategies, reflecting the dominant agricultural and rural development goals during each period. In looking back, the evidence suggests that investments in agricultural research and extension have served the country well, particularly in achieving food self-sufficiency. At the same time, hunger and malnutrition are persistent problems for the rural poor, and rural economic growth seems stalled at the 2% level as the rest of the economy moves forward at a quicker pace. This is the backdrop in considering the future direction for agricultural extension in India.

The introduction of the Training-and-Visit (T&V) Extension system was an important milestone in the history of extension in India. The basic premise of T&V was that there was enough technology available awaiting diffusion to and adoption by farmers. The Training and Visit (T&V) Extension System was effective in disseminating *Green Revolution* technology, especially in the high potential, irrigated areas, but it had little effect on the productivity and incomes among farmers in rainfed areas.

During the mid-1990s, the Government of India and the World Bank began exploring new approaches to extension that would address these system problems and constraints. The result was a new, decentralized extension approach, which would focus more directly on agricultural diversification and increasing farm income and rural employment. The central institutional innovation that emerged to address these system problems was the Agricultural Technology Management Agency or "ATMA" model that was introduced at the district level to:

1) Integrate extension programs across the line departments (i.e., more of a farming systems approach),

2) Link research and extension activities within each district, and

3) Decentralize decision-making through "bottom-up" planning procedures that would directly involve farmers and the private sector in planning and implementing extension programs at the block and district-levels.

This model was pilot-tested through the Innovations for Technology Dissemination (ITD) component of a World Bank-funded, National Agricultural Technology Project (NATP)

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[1] Professor of Agricultural Economics, S.G.I.D.T., Patna (R.A.U., Bihar)

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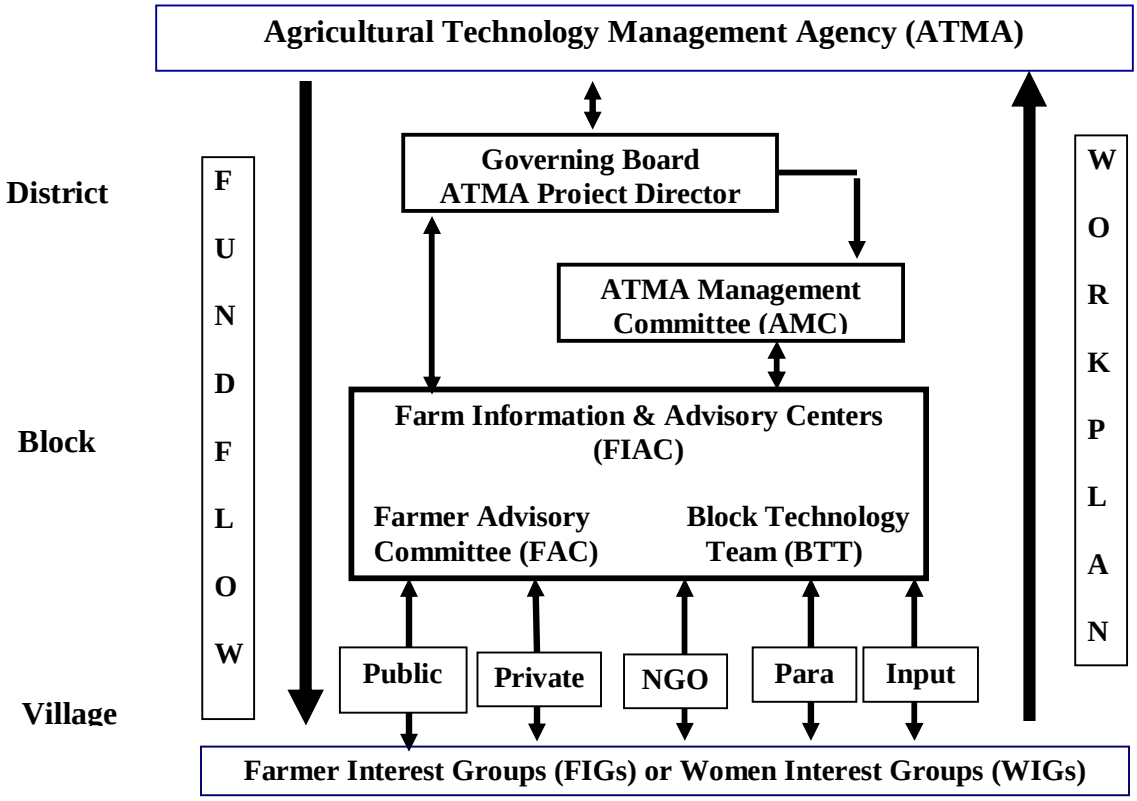
that became effective in 1998 and concluded in June 2005. The next section of this paper will describe how this decentralized extension model is organized and how it operates.

The ATMA Model

Overview. The Agricultural Technology Management Agency (ATMA) is an autonomous organization registered under the "Societies Registration Act of 1860" that has considerable operational flexibility. For example, it can receive and dispense government funds, enter into contracts, maintain revolving funds, collect fees and charge for services. In addition, it operates under the direction and guidance of a Governing Board (GB) that determines program priorities and assesses program impacts. The head of each ATMA, known as the Project Director or PD under the NATP, reports directly to the GB. The PD serves as chair of the ATMA Management Committee (AMC), which includes the heads of all line departments and the heads of research organizations within the district, including the Krishi Vigyan Kendra (KVK) and Zonal Research Station (ZRS). Each district has a KVK; therefore, this multidisciplinary *Farm Science Center* plays a critical role in both on-farm research and training farmers in new production and value-added processing technologies. However, it is the PD that helps coordinate and integrate all agricultural research and extension activities carried out within the district. The organizational structure of the ATMA model is shown in Figure 1; the remainder of this section will explain how these different components of the ATMA model operate.

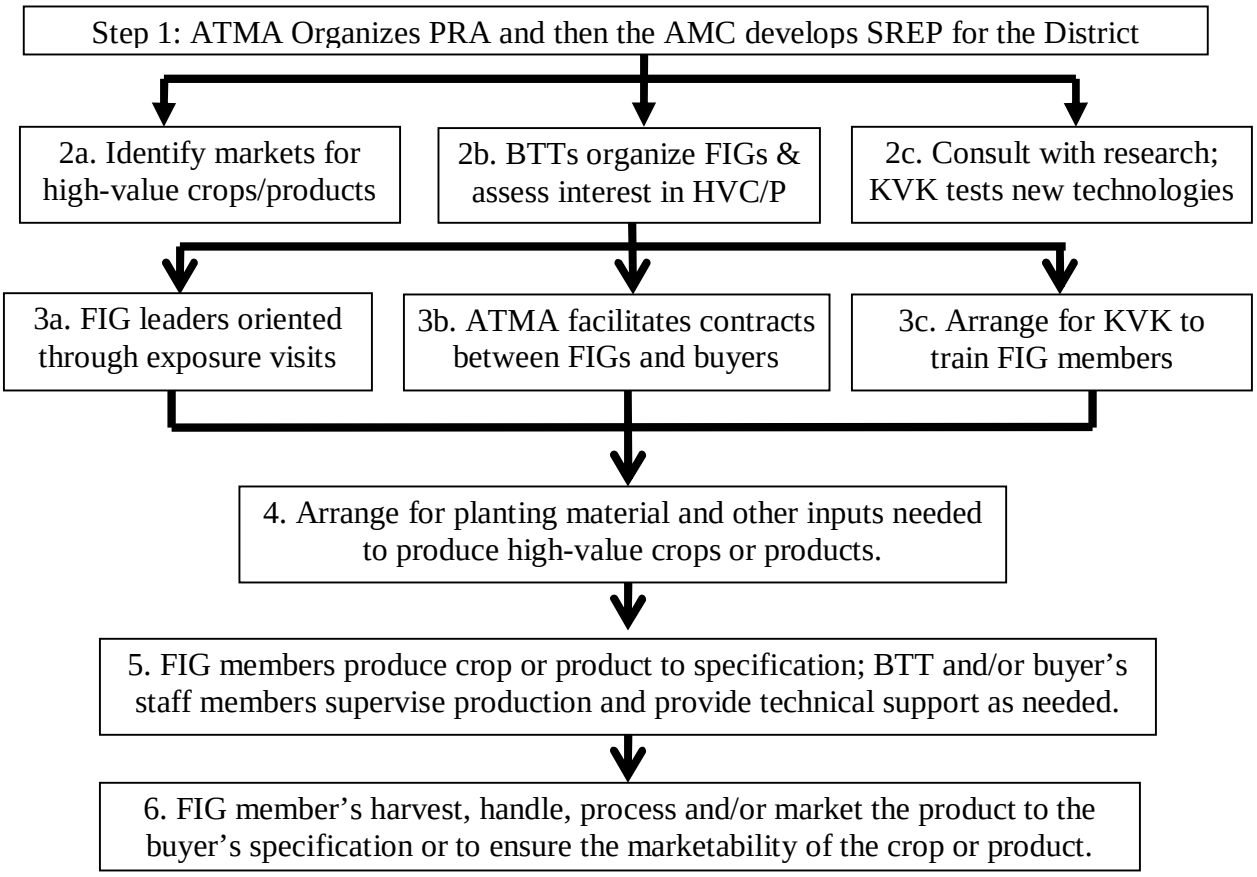
Figure 1: Organizational Structure of ATMA



Steps in Implementing the ATMA Model and Creating a Market-Driven Extension System

To begin implementing the ATMA concept, the first step was to engage the leaders of the research institutions and the heads of the line departments in developing a Strategic Research and Extension Plan (SREP) for the district. This process began by first training these research and extension leaders in how to conduct a participatory rural appraisal (PRA). This process joined these research and extension leaders—in many cases for the first time in a joint activity—with farmers from representative villages within the district. Collectively, they began to listen to farmer problems and then they had to translate these concerns into research and extension priorities. In the process, they examined "success stories" within the district, examples of how entrepreneurial farmers had identified markets for high-value crops/products (HVC/P) and developed supply chains to serve these markets.

Figure 2: Steps in Developing Market-Driven Extension System



After completing a SWOT analysis, these research and extension leaders developed a SREP that was presented to ATMA GB for consideration and approval. This SREP helped establish research and extension priorities for the district that were then implemented through this new ATMA model.

After preparing the SREP for the district, the next step was to implement this plan using a market-driven extension approach. Based on experiences gained through NATP, it is possible to outline these steps and procedures in more detail, as outlined in Figure 2. The remainder of this section will briefly describe these steps, including examples to illustrate how these procedures were actually implemented. For a comprehensive case study that explains this process in more detail, see K.M. Singh, et al., 2005.

Identifying Markets and Supply Chains for Promising High-Value Crops and Products.

There are four axioms that are essential to a successful "partnerships with private partners in a market-driven extension system."

- The ***first axiom*** is that if there isn't a market, don't encourage farmers to produce a specific crop or product. Therefore, the first task to be carried out is to assess the potential markets for different high-value crops or products that can be successfully produced in different blocks within the district.
- The ***second axiom*** is that if farmers cannot easily transport the product to market, look for more promising products that can be easily marketed.
- The ***third axiom*** is that if the crop (or product) cannot be successfully grown or produced within the district due to unfavorable agro-ecological conditions, then look for more promising crops or products that are well suited to the district.
- The ***fourth axiom*** is to diversify into a variety of different high-value crops/products that are suitable for different FIGs or WIGs within the district. This approach will mitigate risk by not saturating the market with one or two products and, thereby, driving down prices.

The first set of products, markets and supply chains to be examined are the "success stories" that are identified during the PRA. These success stories are the results of entrepreneurial farmers who have identified a market, worked out a successful production technology and a way of marketing the product. The task is to assess each success story to determine whether each success story is supplying a very small niche market or whether there is considerable scope to expand the production and marketing of this crop/product. If the latter is the case, then these entrepreneurial farmers can either work with the ATMA as a key resource person in training other farmers or he/she may decide to become a Farm Leader in the district who can help organize interested farmers into FIGs and then train these FIG members in the production of this crop/product and in organizing the marketing of this crop/product.

In India, with the move toward a more market-driven extension system, a portfolio of 250 different success stories was compiled from across the country under NATP (see IIM-Lucknow, 2004b). In many cases, these products can be marketed locally or to nearby regional markets, which can be replicated throughout the country. In addition, markets for higher-value products are expanding rapidly in India as the urban middle-class has more disposable income and desires new products. Therefore, markets for different high-

value products can be expected to grow rapidly as India continues to experience rapid economic growth.

To help identify these new markets and other resources within the area, the ATMA in Patna District of Bihar compiled a two-volume directory of buyers, sellers and processors in the district and beyond, which was widely welcomed by all stakeholders, especially the Farmer Interest Groups (FIGs). The key for the ATMA is to first identify these different markets and then to determine if farmers within the district would have a competitive advantage in producing these crops or products due to superior growing conditions, proximity to markets and/or a suitable transportation system.

Organizing Farmer Interest Groups (FIGs).

As noted earlier, different FIGs have different resources, interests and the capacity to manage or tolerate risk; therefore, different FIGs and WIGs will be interested in pursuing different crops, livestock, fisheries or other enterprises (e.g., vermi-composting or mushroom production may be of interest to very poor, landless rural women). As a result, there will be a range of FIGs within each block and district, depending on their interests and resources. The key for the ATMA, working through the BTTs and FACs, is to get these different groups of farmers organized into different types of FIGs.

Another important observation from the NATP experience is that men prefer to organize in more homogeneous, socio-economic groups, while women are more open to participating in groups that cut across socio-economic categories within a village. Therefore, male FIGs are more likely to organize horizontally with other members in a village who have similar resources, farming systems and social status. On the other hand, women FIGs (or WIGs) are more likely and better suited to organize vertically within a community, thereby, mobilizing the rural poor. The reason is that women from wealthier families are more likely to be literate, have more education and also be willing to assist illiterate women from very poor families. The common pattern is for village women to first organize into a self-help group (micro-lending or credit group) and then to begin producing some type of income-generating product for sale (e.g., poultry, vermi-compost, mushrooms, dairy, sericulture) or to pursue some type of joint enterprise, such as producing fish in a village tank (see: J.P. Singh, 2005).

Consulting with Research about Available Technologies.

Since researchers from the local KVK and, possibly, ZRS would be involved in the PRA and in assessing different success stories within the district, a preliminary analysis of the technical feasibility or suitability of different crop and/or livestock enterprises can be carried out while developing the SREP. However, as more detailed information is gathered on specific markets for different crops/products and farmers interests, it is important to carefully examine the agro-ecological conditions in each block of the district and the availability and suitability (through on-farm research) of different production technologies vis-à-vis local growing conditions. In some cases, researchers at SAUs, national research institutions and/or the private sector will need to be consulted in

assessing the feasibility of pursuing a particular crop or product. If such a crop or enterprise appears to be feasible in the district, then the ATMA is ready to move into the next phase of linking FIGs to promising markets.

Orienting FIG Leaders through Exposure Visits.

The NATP made extensive use of exposure visits or "farmer-to-farmer extension" in orienting different FIGs to different high-value crops, products or enterprises. If a group of FIGs were interested in a particular crop or enterprise, then the FIG leaders would be taken to visit an entrepreneurial farmer or FIG in a nearby district. In selected cases, FIG leaders went to different states, sometimes across the country to interview and consult with other farmer groups who were producing a specific crop or product. Also, FIG leaders were sometimes taken to the SAU or a national research institute to consult with specialists about a particular crop or product, so they would be fully knowledgeable about the required production and post-harvest technologies and the possible risks or problems that might be incurred in producing this crop or product. The objective of these exposure visits would be for these farm leaders to be fully knowledgeable about the proposed enterprise and convinced that they could produce the crop or product to market specification. After they returned home, these FIG leaders would meet with the other FIG members to share this information and to discuss the next steps in moving forward on the proposed enterprise.

Facilitating Contracts or Agreements between FIGs and Buyers.

In the case of products that have very limited markets, ATMAs worked to secure contracts or purchase agreements between buyers and the FIGs. For example, in the case of medicinal crops grown in the Patna District of Bihar (see: K.M. Singh, et al., 2005), the ATMA identified those companies that actually process specific medicinal and aromatic crops and then determined each company's interest, if any, in purchasing the crop directly from farmers in the district. If a company were interested, then the ATMA would facilitate the negotiation of a contract or purchase agreement between the company and a group of FIGs to produce a specific quantity of the crop, at an agreed upon price and with the production and quality requirements being clearly specified. Once such a contract or agreement had been reached, then the ATMA would make arrangements for all FIG members to be trained in the required production technologies and to secure suitable planting material and/or other inputs.

Arranging for Training FIG Members.

At this step in the process, all FIG members were already familiar with the crop or product to be produced and were aware that they would be able to market the product. Therefore, the members would be highly motivated to learn the details about the production technology to be used and how to handle specific problems, should they arise. Since the KVKs have specialists (trainers) for most categories of high-value crops and enterprises, in most cases, the KVK would take the lead in organizing a detailed training course or workshop for the FIG members. In many cases, they would involve other

specialists in these courses, such as researchers from SAUs and/or national research organizations for the particular crop or product.

In some cases, they would also involve the technical specialist(s) from the buying firm, so that FIG members would be fully conversant with the production and post-harvest technologies to be used. In some cases, an entrepreneurial farmer, who was already successfully producing this crop or product in another district or state, would be brought in as a resource person or "farmer professor" to share his/her experiences with the FIG members. In addition to the FIG members, the local BTT staff members for this particular crop or enterprise would be directly involved in these training courses, since they would be assisting with the technical backstopping and supervision for these FIGs during the growing season.

Arranging for Planting Materials and Other Inputs.

At the outset of producing a new crop or enterprise, FIG members will need assistance in securing suitable planting material, seeds and other inputs required to product a particular crop or product to specification. In some cases, the buyer would provide the correct seeds and then deduct the seed cost at the time the product is delivered and sold to the buyer. In other cases, the ATMA procured the correct seeds and sold the seed to the FIG members at cost. In still other cases, either the ATMA or KVK would multiply the seed or planting material and then sell these inputs to FIG members. However, once FIGs are successfully producing the specific crop or product, they would be expected to take over responsibility for securing the necessary seed and other inputs.

FIG Members Produce the Crop or Product to Specification.

During the first and second year of producing a specific crop or product, the FIG members will need regular supervision and technical support to ensure that the crop or product is produced to specification. Therefore, the appropriate member of the BTT staff in each block would be responsible for monitoring the crop or product and providing technical supervision and support to all FIG members. In the case of a specialized crop or product, it is likely that the buyer will assign one or more of his/her technical staff to make regular farm visits to ensure that the correct production practices are being followed. Should a particular problem arise, the FIG leader could be in immediate contact with the BTT member, and he/she could call on the KVK trainer or the buyer's technical staff for immediate consultation. In case of an unusual problem, a specialist from the SAU or national research organization might be called in to assist.

FIG Members Harvest, Handle and Deliver the Product.

Given the vast range of high-value crops and products being produced under this market-driven extension approach, the marketing of different crops or products varies significantly. In the case of contract production, the post-harvest handling and delivery of the product is fully spelled out so farmers know precisely what is required. In the case of other crops or products, the FIG members themselves, the FIG leader, or a marketing

specialist hired by a Farmer Association (of FIGs) may be responsible for arranging the transportation, processing and/or marketing of the product. For example, local some FIGs may begin producing flowers for one or more festivals at a nearby temple. In these cases, either the individual FIG members or the FIG as a group may take responsibility for making and selling flower necklaces or other products to pilgrims who are attending a festival. In one district in Maharashtra, the ATMA set up a supply chain for several groups of fishermen, who organized into FIGs, so they could sell their product directly to a fish exporter in Mumbai, rather than being taken advantage of individually by fish traders. In another case, the ATMA helped a group of FIGs producing cashews to begin processing the product for sale to an exporter. In short, each product or situation may differ; therefore, it is important that the ATMA take the lead in working out the production, post-harvest handling, processing and/or marketing of different products in a manner that will increase the farm income of FIG members and rural employment within the district.

Other activities by ATMAs in PPP mode

A. ATMA-Field Outreach Activities

1. Promotion of Agri Clinics & Agri Business Centres
2. Technical publications in local language
3. Video films developed with help of private sector
4. Success stories used as role models for extension
5. Cyber marketing support to farmers with the help of private entrepreneurs
6. Networking with organizations working in the field of extension
7. Constant capacity building of stakeholders
8. Gender issues given maximum attention

B. Process Interventions by ATMA

1. ATMA Single Window delivery point for Technology.
2. Diversification dictated by market demand.
3. Judicious Use of Mass media.
4. R-E-F-M linkages strengthened with primary focus on farmer.
5. Revitalizing the farmers through capacity building,
6. Using farmers and private entrepreneurs as Extension Agents.
7. Group focus in all the interventions.
8. Effective use of NGO's, & private sector.
9. Sustainability given due importance, with cost sharing being the key word in most of the interventions.

C. Elements for Success of New Strategy

1. Refocus some research and extension resources to high-value crops/products, including market assessment
2. Decentralize extension planning and decision-making;
3. Begin by focusing on local and regional market opportunities.
4. Empowering Farmers—organize and train farmers so they can link to high-value markets;

5. Farmers must get organized to achieve economies of scale and to increase market power.

D. ATMA Experiment - Lessons Learnt

1. Autonomy, financial flexibility and direct funding resulted in better outcome.
2. Better coordination, Convergence, pooling of resources and integrated delivery of demand driven extension.
3. Priority settings through the farmers involvement (SREP , GB and FIAC).
4. Strong Research-Extension-Farmer-Market (R-E-F-M) Linkage.
5. ATMA a platform for Public Private Partnership.
6. SREP as a tool for bottom-up planning
7. Capacity building through need-based trainings, exposure visits, demonstrations, etc.

E. Some other examples of Public Private Partnership Initiatives in Patna

1. Using Private Sector for Extension
    i. Bihar Industries Association,
    ii. Baidyanath Ayurved Bhawan ,
    iii. Fragrance Herbs,
    iv. Ayurved Shri Herbals Ltd.,
    v. Pamer Agro Ventures (P) Ltd.,
    vi. Amrapali Foods, Ltd.
    vii. Samrat Mushrooms,
    viii. Micro Tech Nutracueticals,
    ix. Raj Agrico,
    x. Bihar Chamber of Commerce,
    xi. Decent Enterprises (I) Pvt. Ltd.,
    xii. Golden Fries Ltd
2. Using NGOs for Extension
    i. Sristi Foundation,
    ii. Adarsh Gramin Vikas Sansthan,
    iii. Prem Youth Foundation,
    iv. RP Channel-5 Vitarani Krishak Samiti,
    v. Paliganj Vitarani Krishak Samiti,
    vi. Manjhauli Vitarani Krishak Samiti,
    vii. Nari Gunjan,
    viii. Mahila Bal Jyoti Kendra
3. Promoting Extension Through Farmer Change-Agents
    i. Diversification in agril,
    ii. MAPs cultivation,
    iii. Mushroom cultivation,
    iv. Zero tillage,
    v. NRM and INM etc.
4. Kisan Samman Yojana- An Initiative for Farmer-to-Farmer Extension

i. Awarded farmers to be involved as Trainers for Farmer-to-Farmer extension

5. Organizing Women into Commodity-Based Farmer Associations
6. Release of the Directory of Extn. Service Providers

Various Models for Funding & Delivery under PPP mode

1. Public delivery and public finance – traditional government extension but diminished budgetary support (high potential areas)
2. Public delivery and private finance – contracting public staff (high potential areas/high value produce)
3. Private delivery and private finance – privatised extension (high value enterprises, Agrovets)
4. Private delivery and public finance – NGOs, CBOs (low potential areas)

Keys to Successful PPP

1. Producers need assistance
    1. Self assessment tools provides learning to the company
    2. Assistance motivates producer
    3. Assessment is an educational process
2. Producers must respect and trust the third party they are working with
    1. Implementation dependent on trust
    2. Must correspond to modern production practices, speak their language
3. Partnerships work best
    1. Each agency brings own strengths
    2. Commodity groups critical to acceptance
    3. Education is essential
4. Producers need Incentives too
    1. Companies should go beyond compliance
    2. Recognition and awards are desired
    3. Greater access to financial assistance
    4. Less regulatory oversight, liability, and insurance could work on larger operations
    5. Difficult to capitalize on market benefits
5. Producers must take active role in process
    1. Plans, assessments, done without producer input rarely get adopted
    2. Education is necessary to get producers to point where input is helpful
    3. Decisions should be documented
6. EMS's may offer opportunity
    1. Record keeping often lacking
    2. EMS's require policy, assessment, planning, documentation, and continuous improvement to go beyond compliance
    3. Most certifications require education, assessment, planning, and certification
    4. EMS not for everyone.
    5. Could provide market benefit

Overall Achievements and Impacts of ATMA model

The implementation of the ITD component of NATP was monitored and evaluated (M&E) by an independent agency, the Indian Institute of Management (IIM), Lucknow. The resulting M&E reports revealed that these institutional and operational reforms, as outlined above, had been largely achieved. In addition, IIM Lucknow documented the following project impacts:

- More than 10,800 crop or product-based FIGs had been organized at village level, with 85 FAs or FFs being organized at the block and district levels.
- Approximately 700,000 farmers, including over 100,000 women farmers, directly benefited from these new extension programs through a combination of exposure visits, farmer training courses, on-farm trials, demonstrations and so forth.
- More than 250 farmer-led, successful innovations had been implemented and documented within the ATMA districts (IIM-Lucknow, 2004b).
- Many ATMAs, such as those in Maharashtra, developed strong partnerships with private sector firms, ranging from poultry marketing; organic farming; the production, processing and marketing of medicinal and aromatic crops; and the export of specific commodities (basmati rice, baby corn, snow peas, etc.); to jointly operating Information Technology (IT) kiosks in collaboration with block-level FIACs.
- Finally, ATMAs have promoted eco-friendly, sustainable agricultural technologies, such as integrated pest management (IPM), Integrated Nutrient Management (INM), organic farming, and the use of water conservation practices, including well recharging, converting from water-intensive crops, such as paddy and wheat, to water extensive crops, such as vegetables, floriculture, maize, oilseeds and pulses. Also, all ATMAs have promoted the use of micro-irrigation systems.

In addition to these institutional and technological achievements, ATMAs have contributed directly to increased farm income and rural employment through agricultural diversification. For example, IIM-Lucknow empirically documented the following impacts of the ATMA approach on the cropping systems and farm income across the 28 project districts during the four-year period from 1999−2003:

- Horticultural cropping area increased from 12% to 16%
- Oilseed crop area increased from 3% to 11%
- Herbs, medicinal and aromatic crop area increased from 1% to 5%
- Area planted to cereals (wheat and rice) declined from 55% to 47%, but yields increased 14% resulting in no appreciable loss in staple food crop production.
- Average farm income in project districts increased 24% during this four year period, in contrast with only 5% in non-project districts (Tyagi and Verma, 2004).

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