

The State of Agricultural Extension Reforms in India: Strategic Priorities and Policy Options[§]

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Abstract

Agricultural extension in India has undergone several changes since independence. Still, a large number of smallholder farmers and other vulnerable groups remain unreached by the public extension system. A number of organizational performance issues hinder the effectiveness and efficiency of public extension system. These include inadequate staff numbers, low partnerships, and continued top-down linear focus to extension. This paper has presented a critical review of the current state of agricultural extension reforms in India and based on the field case studies in four states —Bihar, Himachal Pradesh, Maharashtra, and Tamil Nadu —has identified policy priorities and strategic options for further refining the on-going reform process and effective implementation of the public agricultural extension system.

Key words: Agricultural extension, strategic priorities, policy options, extension reforms

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Introduction

The Indian agriculture is at the crossroads today. Its strength to alleviate poverty and hunger is well-recognized, yet, the agricultural growth rate in the past 20 years has been visibly less impressive and the

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productivity in the agricultural sector continues to be low compared to the international standards. While investments in research and extension have increased in recent years, their impact on smallholder farmers' livelihoods remains debatable. Even when these investments may address relevant problems of the farmers, the benefits of improved technologies will not fully accrue to the farmers. The yield gap between research stations and farmers' field remains high. For translating research results into tangible gains at farm-level, well-functioning agricultural extension and advisory services are required.

The Indian public agricultural extension system is one of the largest knowledge and information dissemination institutions in the world. The system played a critical role during the Green Revolution period, but in recent years, it has undergone a high

level of scrutiny (Sontakki *et al.*, 2010; Pal, 2008; Joshi *et al.*, 2005). Several efforts have been made in the public sector over the past one decade to initiate various reform measures and operational models to improve the organizational performance of this system. Yet, the challenge of enhancing relevance, efficiency, and effectiveness of the public sector agricultural extension system in meeting its organizational goals and objectives remains unresolved (WGAE, 2007; Raabe, 2008; Glendenning *et al.*, 2010; Desai *et al.*, 2011).

Undoubtedly, without a well-functioning national agricultural research system (NARS) capable to produce relevant technologies and knowledge base, any amount of reforms in the agricultural extension system will be unsuccessful (Binswanger-Mkhizi and Zhong, 2012). The reforming of NARS in India has been the subject of extensive analysis and the focus of several high-powered committees (NAAS, 2005; NFC, 2006; Pal, 2008; ICAR, 2011). India is endowed with a strong NARS, comprising the Indian Council of Agricultural Research (ICAR) and State Agricultural Universities (SAUs). The ICAR is the apex body for agricultural research and education in the country. The contributions of agricultural research have been commendable to the global agri-food systems, especially during the Green Revolution period in the mid-1960s and early-1970s. A perfect symphony of research, technology, and input delivery, and agricultural policies was responsible for the impressive performance of Indian agriculture in the 1970s and the 1980s. The production of rice and wheat witnessed a spectacular increase, and transformed Indian agriculture from deficit to self-sufficiency in food grains (Joshi *et al.*, 2005). Although the NARS has been responding to the challenges faced by Indian agriculture, it is often criticized for not attending to the demands for improved technologies and also for the poor linkages between research and extension systems (Desai *et al.*, 2011).

This paper examines the current state of agricultural extension reforms and their linkages to the agricultural research system reforms in India, and identifies the policy options and strategic priorities for making it relevant, responsive and efficient. It explores how the NARS responded with its own set of reforms that were sought to increase its relevance and its linkages to the extension systems reforms. It also provides an assessment of the organizational performance of the major public sector policy reforms

in the agricultural extension — the Agricultural Technology Management Agency (ATMA) model — using the case studies of seven districts in four Indian states (Bihar, Himachal Pradesh, Maharashtra and Tamil Nadu), located in different agro-ecological zones of the country.

The paper is organized in seven sections. After a brief background in section one, the following section provides the evolution of agricultural extension system in the country. In section three, a snap-shot on emerging challenges and issues for agricultural extension and advisory services is given. Farmers' access and sources of extension are discussed in section four, using NSSO data and also several case studies conducted in recent years. Section five examines the performance of Agricultural Technology Management Agency with respect to its relevance and reach to the farmers. It is followed by the section that prescribes policies and strategies for reforming agricultural extension system in the country. Finally, in the last section, we conclude the conditions for successful extension reforms in the country.

Evolution of the Extension System in Indian Agriculture

The evolution of agricultural extension system in India has a long history. Its contribution to productivity enhancement during the Green Revolution era has been well documented. During this period, the public extension system played the key role in conducting field demonstrations of high-yielding varieties and improving the input delivery that ensured timely availability of quality seeds, fertilizers and agricultural chemicals at affordable prices. Along with extension services, the price policy and procurement support through public agencies provided additional encouragement to the farmers for adoption of high-yielding varieties in the 1960s and 1970s. By the end of 1970s, the Green Revolution type of extension system had largely achieved its major goal of increasing the area under high-yielding varieties (Ameur, 1994).

In the late-1970s, the agricultural extension system became mostly involved in the distribution of agricultural inputs through the state agricultural depots and handling of the subsidies that were provided through various agricultural development programs. The public sector extension system as a whole seemed

to have become a monolithic organization without specific goals to achieve. Sustaining such a large system without added benefits to agricultural productivity became a big challenge for agriculture ministries at both the central and state levels. Therefore, reforming of the system towards goal orientation and better operational efficiency was sought. A Training and Visit (T&V) system was introduced in extension services on a pilot scale in Rajasthan in 1974 with World Bank funding support and was scaled up to several other states in 1977 (Ameur, 1994). While impressive results were documented by the studies that evaluated the T&V system, the issues related to sustainability of funding, high requirement of staffing, and the quality of staff became the key concerns (Federet *et al.*, 1987; Anderson and Feder, 2004). The state governments could not meet the high level of recurrent costs of the system and stopped recruitment of new staff after the World Bank funding ended in the early-1990s. Over the next ten years, due to the low level of staff and low resources to cover their costs, no serious efforts were made to hold the extension officials accountable. No specific goals were set and the agricultural extension system as a whole had become moribund, although the T&V system continued as a method of public extension (Anderson *et al.*, 2006). Thus, began a period of low commitment from the policymakers at the state level. This was reinforced by the ineffectiveness of the extension system as a whole in contributing to farmers' needs. As a result, the T&V system, or whatever remained of it, was seen as an unrealistic model by many state governments, though some elements of the model still continue to be implemented in several states.

About a decade ago, in order to introduce reforms in the public sector agricultural extension system and increase its relevance, accessibility, and efficiency of knowledge sharing among various actors, players, and stakeholders, the Agricultural Technology Management Agency (ATMA) was introduced as a pilot (1998-2003) in 28 districts (DAC, 2005). Following a positive feedback from the pilot implementation (IIM, 2004), the ATMA model was scaled up across 251 rural districts in 2005 and throughout the country in 2007 (Reddy and Swanson, 2006). In June 2010, revised guidelines for ATMA were issued in order to incorporate the lessons learnt from the implementation thus far (DAC, 2010). However, several operational and organizational challenges continue to confront the

ATMA as a system of extension. The ATMA faces severe capacity and institutional constraints. Yet, ATMA is seen as the key intervention for reforming the extension system in India. There is increased call for evaluating the impact of ATMA model on the farm level benefits. However, an understanding of the variance between the intended guidelines and the actual implementation of the program is still lacking. Further, the organizational and capacity challenges in its implementation have not been fully recognized (Anderson, 2007). Such information is the first step towards the analysis of the impact of the program. In what follows we take a critical look at the organizational performance issues faced in the implementation of ATMA to provide program and policy feedback for further refining the reform process. But, first we examine the global patterns in extension reforms, followed by the existing use of extension by the farmers in India.

Issues for Extension and Advisory Services

India is not alone in the world in reforming its extension and research systems. There are many countries where extension and advisory services reforms are occurring globally (Swanson and Rajalahti, 2010; World Bank, 2012). A common pattern in most developing countries is to decentralize the extension systems since agro-ecological conditions and access to markets vary within most countries. Making extension decentralized and demand-driven gives the farmers a better say in setting the agenda and demanding extension and research priorities. The extension reforms strive to reach those groups — smallholders, resource-poor, and women farmers — which often remain unreached by the existing extension systems, and instead often tend to address the needs of progressive and commercially-viable farmers. The reform measures also focus on sustainability. Without adequate public funding, agricultural extension systems in many developing countries will not be sustainable in the long-run. Donor funds are not highly reliable and are targeted mostly to pilot projects. When the donor funds dry up or the pilot projects end, the farmers no longer have access to the extension services (Birner and Anderson, 2007). The public sector has a role to play in developing a sustainable system of extension services delivery. Recognizing that a top-down approach does not always address the needs of farmers,

extension reforms also focus on making extension and advisory services farmer-led and demand-driven. However, in any extension reform, poorly developed and inadequate monitoring systems, coupled with low human and institutional capacities, remain a major constraint to scaling-up successful pilot programs. Another reform option is the increased use of modern information and communication technologies (ICTs), but this calls for a higher level of investment in order to make them accessible by the smallholder farmers (Aker, 2011). Given the broad lessons emerging from global experiences and the immediate need for understanding the challenges and constraints in continuing the reforms in agricultural extension system in India, we next review the farmers' access to agricultural extension and advisory services and the various sources from which farmers access these services in the context of extension system reforms.

Farmers' Access and Sources of Extension Services

The only nation-wide survey of farmers' access to extension is the 2003 National Sample Survey Organization (NSSO) 59th round, 33rd schedule on 'Situation Assessment Survey of Farmers'. Sixty per cent of the farmer-households in India did not access any information on modern technologies that year. That such a large proportion of the farming population does not use any extension service indicates the poor organizational performance of the public extension in 2003. It was aptly identified in the 10th and 11th five-year plans, which recognized that the public extension system needed 'revamping' and 'revitalizing'.

While a more recent nation-wide survey is not available, a number of IFPRI studies have shown a picture different from the NSSO 2003 survey. In Tamil Nadu, a 576 farmer-households survey in two districts has shown that only 1 per cent of the respondents had not accessed any information to support their farm enterprise in 2010. By comparison in 2003, the NSSO survey data show that 50 per cent of the farmers in Tamil Nadu did not access extension for information. From a survey of farmer-households, Birner and Anderson (2007) have reported that of the 966 farmer-households surveyed, 22 per cent had at least one contact with a government extension worker during the past one year, which was greater than the average of 11.5 per cent reported for Karnataka in the NSSO

2003 survey (NSSO, 2005). A survey of 810 households each in Uttar Pradesh, Madhya Pradesh and Andhra Pradesh revealed a different extent of extension-use in these states in 2009; it was 18 per cent in Uttar Pradesh (Reardon *et al.*, 2011a), 80 per cent in Madhya Pradesh (Reardon *et al.*, 2011b) and 95 per cent in Andhra Pradesh (Chandrasekhar *et al.*, 2011). While the recent small-scale surveys have shown that extension access might have improved since the time of the NSSO 2003, a nation-wide survey is needed to show the difference in extension-use since the implementation of major reforms in public sector agricultural extension through programs like the 'Support to State Extension Programs for Extension Reform' (SSEPER) and the Agricultural Technology Management Agency (ATMA).

Progressive farmers and family members, as well as mass media and the private sector constitute a large part of farmers' sources of information. Another issue is that the quality and reliability of public extension system is still a constraint (Babu *et al.*, 2012). On sources of extension services, the NSSO survey results have shown that nearly one-third of the farmers who had accessed information, obtained it from progressive farmers and input dealers. Broadcast media, including radio, television and newspapers, was also largely used to obtain information (by about 29.3% farmers). The public sector extension system was a source of information for about 10 per cent of the farmers. The private and NGO extension services were accessed by only 0.6 per cent of the farmers. Farmers tried and adopted the information that they received from progressive farmers and input dealers more than from other sources. The service delivery by public-sector extension workers was lowest for small farmers (4.8% versus 12.4% for large farmers), which suggests that the system may be biased against small farmers (Adhiguru *et al.*, 2009).

In a recent survey of farmers in Tamil Nadu in 2010, the input dealer was reported to be the main source of information (68.6%), followed by the state department of agriculture extension staff (51.2%), TV (43.6%), family members or relatives (39.9%), progressive farmers (36.2%), Primary Agricultural Cooperative Banks (35.7%) and newspapers (30.6%). Farm magazines were accessed by 9.2 per cent of the farmers. Only a small percentage of farmers used radio (5.4%) and farmer group associations (4.7%) to access

information (Babu *et al.*, 2012). The main reasons for the choice of information source were proximity (33.7%), assured quality (21.1%), sole option (20.6%), and timely availability (13.7%).

In Uttar Pradesh, Reardon *et al.* (2011a) have reported that 7 per cent of the sample farmers availed the services of state extension staff, while other public-sector extension sources (KVKs, All-India Radio, university extension, and plant protection units) were collectively a source of information for 18 per cent of the farmers. Madhya Pradesh has presented a more positive picture of public sector extension-use, with 37 per cent of the farmers accessing state extension staff (Reardon *et al.*, 2011b). Other major sources of extension services for farmers in Madhya Pradesh were All-India Radio and TV (21%), and KVKs (12%). The private-sector sources accounted for 25 per cent.

The studies reported above suggest that the organizational performance of extension system could be influenced by local conditions. Therefore, reforms in the extension system would need to allow flexibility in the service delivery to adapt to different situations. Consideration of state variabilities is important in developing extension strategies, particularly at the national level where much of the public sector extension policy is formulated. A greater flexibility at the state level to implement effective extension programs is needed.

The provision and delivery of agricultural extension and advisory services to small and marginal farmers remain the important elements of extension reforms in the developing countries. The challenge for smallholder farmers in India is typical (Birner and Andersen, 2007; Chandrasekhar Rao *et al.*, 2011; Reardon *et al.*, 2011a; 2011b). These farmers tend to have minimum access to information. Reaching farmers who search for information the least, would, therefore, require different content, approach and delivery mechanisms, as they have different information needs and rely mostly on interpersonal sources. Targeting smallholder farmers, who have low agricultural income, is important as they search less for information. These farmers mostly lack motivation and interest in agriculture, so improving the timely delivery and reliability of information will be important to encourage them to improve their information search strategies. The studies have revealed that membership of farmer based organizations (FBO) is associated with

high information search behaviours. Being a significant factor in determining information search behaviours, membership in a FBO, self-help group (SHG) or cooperative could be an approach extension services could target to improve access to extension of low and moderate information searchers. A group-based approach could also improve the delivery of demand-driven extension services. This is the main aim of district level public extension institution, the ATMA, though several implementation issues are hindering its effectiveness. Further, the public sector is only one of the many sources farmers use to access extension and advisory services.

Pluralistic Extension and Advisory Services and their Performance

The public sector agricultural extension system in India has gone through a number of changes since independence (Glendenning *et al.*, 2010; Raabe, 2008; Sulaiman and Holt, 2002). Still, several organizational performance issues hinder the effectiveness and efficiency of public agricultural extension system. These include inadequate staff numbers, low partnerships, and continued top-down linear focus to extension. Innovations from the private sector and civil society organizations show that providing an integrated service to farmers, which incorporates local needs, could be more relevant. But, it is clear that the private and civil society sectors will not fulfil the entire role of extension and advisory service in India. The private sector should work in areas where business is sustainable and should interact with farmers on an individual basis. The civil society tends to be project-based and is not widespread. On examining where the capacity lies in each sector, partnerships emerge as an important need; non-governmental organizations (NGOs) and civil society organizations (CSOs) have the capacity to build social capital, but they tend to work on a small scale; the technical expertise lies in the national agricultural research system (ICAR and state agricultural universities), but it is also not able to reach a reasonable scale with limited staff in each district; the private sector can improve market linkages; and the state department of agriculture has the reach across each district of India, but staff are overburdened with other duties.

During the past ten years, the central government has recognised the need to converge and integrate

extension activities at the district level and has implemented a major reform in extension. It aims to achieve this through the institution of Agriculture Technology Management Agency (ATMA). While this is viewed as a huge innovation in agricultural extension system, it is also not without implementation and organizational challenges.

Organizational Performance Assessment of Agricultural Technology Management Agency

The Agricultural Technology Management Agency (ATMA) is the flagship program for agricultural extension reforms in India. It was implemented as a pilot in 28 districts from 1998 to 2004 as part of the World Bank-funded Innovations in Technology Dissemination (ITD) component of the National Agriculture Technology Project (NATP) (Reddy and Swanson, 2006; Singh and Swanson, 2006; Swanson, 2008). The constraints of the Training and Visit (T&V) and post-T&V extension were considered to be addressed in the ATMA pilot.

Over the past one decade, the implementation of extension reforms in the form of ATMA has gone through three phases; the NATP pilot 1998-2004 ATMA (phase I), the 2005-2010 Government of India (GoI) ATMA (phase II), and the post-2010 GoI ATMA (phase III). On the basis of the ATMA pilot, in 2005-06 the Government of India initiated the Support to State Extension Programs for Extension Reforms (SSEPER) project, which was operationalized through ATMA, across 262 districts in all states—about one-third of all districts in India. In 2007, the XIth Five-Year Plan expanded ATMA to all the districts of India, but it was not supported with the provision of additional funding and staff. The XIth Five-Year Plan working group on agricultural extension (WGAE, 2007) identified the organizational performance challenges of the program, including (i) lack of qualified personnel at all levels, (ii) absence of a formal mechanism to support extension delivery below the block level, (iii) inadequate infrastructure support at the state agricultural management and extension training institutes (SAMETIs), and (iv) lack of convergence with other central and state projects. It was not until 2010 that the plan for increased funding to ATMA was approved, resulting in revised guidelines for the ATMA (DAC, 2010).

ATMA is a registered society at the district level. The district extension activities are based on a strategic research and extension plan (SREP) prepared using the participatory rural appraisal (PRA) technique for each district. The ATMA governing board (AGB), chaired by the district magistrate, reviews and approves the SREP for the district and also the annual block action plans (BAP). Other members of the board include the heads of line departments and research organizations as well as stakeholder representatives, including farmers and private sector representatives. The ATMA project director chairs the ATMA management committee (AMC). The AMC is responsible for coordinating the extension activities in the district. The AMC includes the heads of all line departments and research organizations in the district.

At the block level, the farm information and advisory centre (FIAC) is the physical platform where the block technology team (BTT) and farmer advisory committee (FAC) meet to prepare the block action plan (BAP) and implement extension activities. The BTT includes technical officers from various line departments at the block level and consults with the FAC, which includes the heads or representatives of farmer interest groups (FIGs) and self-help groups (SHGs). When FAC approves the BAP, it is reviewed by the AMC and approved for funding by the AGB. The FAC meets monthly to discuss the implementation of the annual BAP. The decision-making process is decentralized to the block level, with active participation of farmer representatives in the development and approval of the BAP.

At the state-level, an interdepartmental working group (IDWG) formulates a state extension work plan (SEWP) to consolidate the district SREPs. The SREP and SEWP are the instruments that promote convergence of extension activities between line departments and research institutions at the district and state levels, respectively. In each state, a state agricultural management and extension training institute (SAMETI) has been established. This institute provides training and undertakes human resource development on the concepts and processes of ATMA to the junior and middle-level extension functionaries. The current performance of ATMA at all of these levels varies from state to state.

In 2010, the Department for Agriculture and Cooperation (DAC) released new guidelines for ATMA (phase III), which included a revised structure. The block to village extension link was formally institutionalized through the concept of a “farmer friend” (FF) for every two villages. A farmer friend is a progressive farmer who has the minimum qualification of a pass in matriculation or intermediate examination and is directly engaged by the block technology manager. Some additional personnel exclusive to the ATMA project have been assigned; these include a state coordinator; faculty and supporting staff for the SAMETI at the state level; a project director, project deputy directors, and supporting staff at the district level (five employees per district); one block technology manager and two subject matter specialists (SMSs) at the block level. Additional activities have been added to the “ATMA cafeteria” (the list of extension-related activities to choose from for funding), including farm schools. Farmer advisory committees (FACs) at the state, district, and block levels now provide advice to the administrative bodies at each level, which were previously defined only at the district level (DAC, 2010).

The block-level structure remains similar to the previous structure but with higher emphasis on incorporating the ICAR institutes, such as the *Krishi Vigyan Kendras* (Farm Science Centres) (KVKs) and Zonal Research Stations (ZRS). It is expected that the KVK scientists will provide technical advice to the BTT and will be involved in preparation of the BAPs. The SREP also aims to involve the Panchayati Raj institutions, the lowest tier of local government. At the village level, the Agriclincs and Agribusiness projects will be incorporated into the ATMA structure.

To examine the organizational performance of the ATMA, this paper has considered the following factors, in addition to the main processes that ATMA is trying to reform in the extension system, namely:

- *Decentralization* — Are the activities of ATMA determined from the decisions made at district or block level? What aspects of organizational performance are hindering decentralization of decision-making at the district and block levels?
- *Linkages in ATMA* — Is ATMA integrating the extension-related activities of ICAR institutes, including KVKs, state line departments, NGOs

and the private sector at the district and block levels, which have been traditionally working in parallel? What aspects are hindering this integration?

- *Farmer Participation* — Are farmers effectively participating in decision-making at the block and district levels? What mechanisms are used in ATMA to understand the needs/demands of farmers (to make it demand-driven)? What aspects are hindering farmer participation? What model of farmer participation is envisaged?

Answers to these questions can help in further refining the design and implementation of ATMA to reach its goals. To understand how ATMA has been implemented and how new guidelines may address the challenges being faced, seven districts in four states — Bihar, Himachal Pradesh, Maharashtra, and Tamil Nadu— were selected as case studies in 2011-12. In each case study, district interviews were conducted with key informants involved in ATMA at the district and block levels. This assessment provided a first look at how different states were implementing ATMA, and the main challenges and constraints in linking different agencies involved in extension in India, particularly between the state department of agriculture and the KVKs, and also empowering farmers to participate and contribute to block and district level extension plans and programs.

The results from the case studies have highlighted several changes brought out by ATMA, although the degree to which they were achieved in different states varied. These included:

- There has been increased recognition of the importance of extension services by the policy-makers at centre and state levels as evidenced through more funding and human resources for extension systems.
- ATMA has expanded the range of extension activities (field technology demonstrations, farmer trainings, study tours, farm schools, exhibitions, and farmer-scientist interaction) at the district and block levels. It has improved the extension system’s ability to respond quickly to the demands of different stakeholders and thereby has enhanced the credibility of extension services. It has also widened the range of topics dealt with by extension system beyond agriculture.

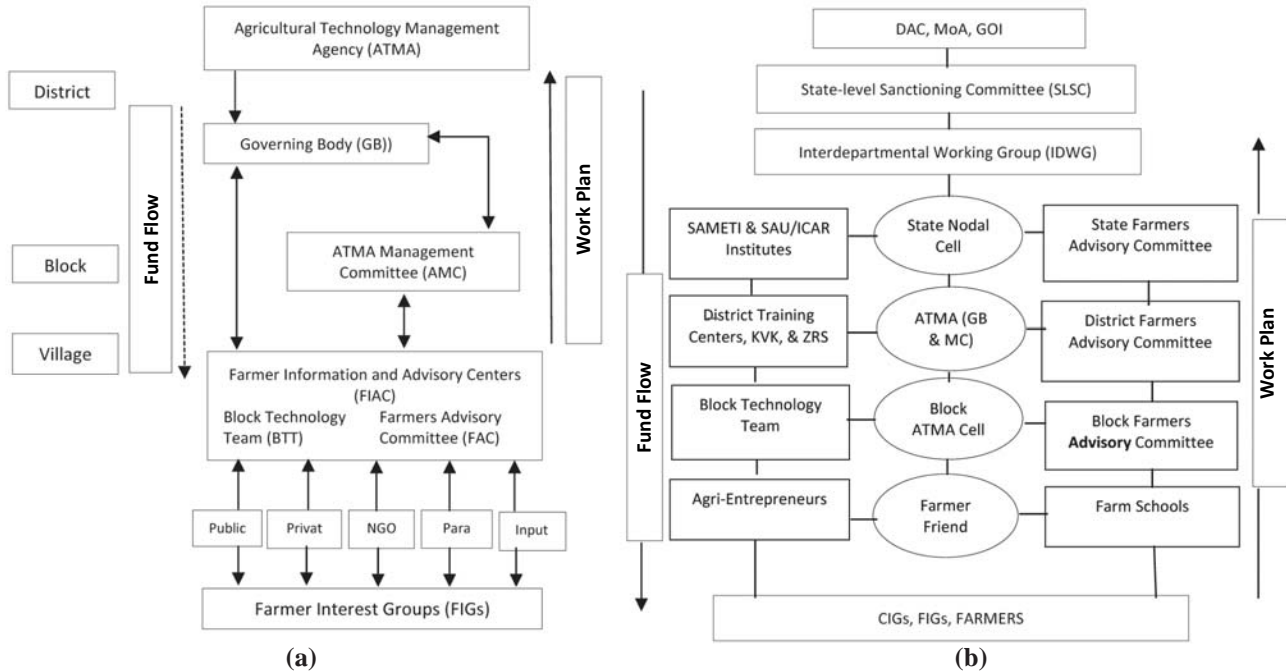


Figure 1. (a) ATMA in phase I; and (b) ATMA in phase II

Source: DAC (2005; 2010)

- ATMA has helped to achieve some convergence among different programmes being implemented by the Department of Agriculture (DOA). The ATMA funds are used for trainings and technology demonstrations to support beneficiaries of several national schemes, such as the National Food Security Mission, National Horticulture Mission, etc., which have funds only for distribution of subsidized equipments and inputs.
- ATMA has helped to improve working relationships of the DOA with other line departments (animal husbandry, horticulture, fisheries, sericulture, forestry, and agricultural engineering), KVKs, research centres of SAUs and ICAR, NGOs, and private entrepreneurs involved in agricultural development. It is partly through regular meetings at the district and block levels and partly through additional funding from ATMA that help some of these departments to implement their extension activities.
- ATMA has brought in new concepts, tools, and approaches to extension planning such as bottom-up planning, farmer involvement in decision-making, participatory rural appraisal, public-private partnerships, commodity interest groups, and beneficiary contributions.
- By implementing a series of activities including regular staff training through establishment of SAMETI at the state level, development of the Strategic Research and Extension Plans (SREPS), formation of Commodity Interest Groups (CIGs), and collection of beneficiary contributions, ATMA has been recognized as a reformed system of extension at the block and district levels. However, it is yet to establish itself as an autonomous institution since it is still implemented as a scheme of the central government and continues to be attached to the DOA at the state and district levels.
- ATMA has created a constituency for its support at the ground level through the mechanism of farmer advisory committee (FAC) and commodity interest groups (CIGs) at the local level and to some extent has expanded public sector extension's reach to the rural communities.
- In some states, some of the CIGs are becoming farmer federations for value addition and marketing. The registration with ATMA helps the CIGs to better access finance from the commercial banks to set up processing facilities. ATMA is also facilitating the CIGs' links with other knowledge and service sources such as marketing agents and equipment manufacturers.

However, the effectiveness of these initiatives varies widely from state to state, from district to district, and from block to block, as ATMA's effectiveness is closely dependent on the interest and time devoted to it by the officials of DOA and other government departments, BTT members, BTM and FAC members as well as their perception of ATMA. Some of the findings on the factors associated with the performance of ATMA are discussed below.

- At the district level, the ATMA is recognized as a new demand-driven and multi-agency approach to extension; but at the block levels and with farmers, this role was not well articulated.
- The performance of ATMA depends crucially on the availability of dedicated staff at all levels. Filling staff positions and providing adequate incentives to retaining them by timely renewal of contracts and creating an enabling environment for them to unleash their full potential are also critical.
- KVKs have begun to work closely with the ATMA at the district level, but this depends on personal interest. Linkages between the ATMA and KVK could still be greatly improved. Funding support from ATMA to KVKs for adaptive research trials helps in this research-extension linkage. However, there has not been much enthusiasm from the ICAR or SAU scientists to pro-actively undertake research on issues identified in the SREP.
- The district officials of various line departments, the KVKs and farmer representatives participate at the district level management meetings. While the research-extension linkage is ensured at the district level, it is not so at the block level.
- Funding for the ATMA has been increasing in recent years. Apart from the actual quantum of resources available, the actual time when the funds are available also affects the performance of ATMA. Delays in release of funds from the centre to the states affect the implementation of SREPs and SEWPs. This is a major policy issue and addressing this can help improve the performance of ATMA.
- A large number of schemes, involving subsidised inputs, are implemented at the district level. These include National Horticultural Mission (NHM), National Food Security Mission (NFSM), watershed development through rural infrastructure development fund (RIDF)-NABARD, initiative for nutritional security through intensive millets promotion (INSIMP), and centrally sponsored scheme on micro irrigation (sprinkler and drip). These schemes provide opportunity for using ATMA for achieving specific goals. In Maharashtra for example, the ATMA funds were used to provide extension support to the scheme beneficiaries. This is a positive sign of harmonization at the district level. However, most of the centrally sponsored schemes have provision for distribution of inputs, but very little resources for knowledge support. This is an area where further convergence of extension goals could be achieved.
- At the block level, the FAC provides a forum for obtaining farmers' input in planning and implementation of ATMA activities. But, farmers' decisions do not strongly influence extension activities, with the majority of extension activities being decided at the district level. Farmers' empowerment to influence decision-making at the block level needs more research. Also, the FAC members tend to be the DOA contact farmers, so increased reach for more farmers needs special consideration. Besides, taking farmer participation one step further to village level through the concept of the farmer friend has not gained a firm footing. The capacity building of farmer representatives of the CIGs and farmer friends could yield better results at the village level and block and district level participation in ATMA meetings.
- The formation of farmer interest groups (FIGs) depicted some progress. However, maintaining and nurturing them to function as effective organizations will require further investments in their capacity building. As the farmer interest groups mature, they need extension support on several aspects (training, demonstrations, market linkages, etc.). These groups also need handholding support especially during the first few years. This is presently a major lacuna.
- Despite prescriptive program guidelines from the centre, there are strong state level differences in the implementation of ATMA. State flexibility to

implement an appropriate reform model of extension is an important need. For example, in some areas farmer groups may be more effective than farmer friend.

Research System Reforms and their Linkage to Extension Reforms

The success of extension system reforms crucially depends on how the research system responds to meet the needs of extension reforms. The most important reform measure from ICAR that relates to the implementation of the extension reform was the issue of a set of directives jointly with the Department of Agriculture and Cooperation (DAC-DARE, 2011; ICAR, 2011). The directives emphasize the need for research entities from ICAR (KVKs and research institutes) and for the SAUs to contribute to the research priorities set by the SREPs and SEWPs as identified by the AMCs and ATMA Governing Boards AGBs at the district level and approved by the IDWG at the state level. While KVKs' linkages with the SREPs are ensured with the ATMA funding at the district level for adaptive research trials, such linkages were not clear from the ICAR and SAU research institutes/centres.

At the ICAR level, the zonal directors (extension) may use the inputs from SREPs to develop regional or sub-regional research agenda and foster linkages between PME (priority setting, monitoring and evaluation) units in research system and extension machinery (KVKs and ATMAs). There is a need for monitoring the priority setting process of research institutions in order to ensure that the research needs identified by SREPs and SEWPs are seriously addressed by the research programs implemented by the ICAR and SAUs. This may be ensured through the participation of SAUs and ICAR institutions operating in the state in the interdepartmental working groups (IDWGs). The increased transparency of discussions and public sharing of the outcomes of IDWG meetings will help in holding the SAUs and ICAR institutions more accountable.

Policy Implications and Strategic Priorities for Extension System Reforms

Several policy and strategic priorities emerge from the review of the extension and associated research reforms and the case studies conducted in the four

states. These have been grouped under the following broad categories: organizational and structural refinements, human resource development, communications, and monitoring and evaluation.

Organizational and Structural Refinements

- *Moving from Decentralization to Devolution* — The decentralization of extension services has been successful to a large extent. Yet, there is a need to move this to further devolution by involving Panchayati Raj institutions to have a monitoring role in the delivery of extension services and holding extension functionaries accountable to the farmers. However, little is known about the ability of the Panchayati Raj institutions to play this role; pilot testing of the reporting mechanisms involving Panchayati Raj institutions will be needed. Further, the implications of such arrangements for elite capture should be understood before such a mechanism can be scaled out.
- *Improving Convergence through Harmonization* —The ATMA has made some progress in the convergence of extension services at the district level. Further convergence of the extension services at all levels requires careful harmonization of work plans of the *Rashtriya Krishi Vikas Yojana* (RKVY), national missions, and other schemes that will require support of the extension services to succeed. Allocation of resources for extension services should be made under these national schemes to support the ATMA activities. This will not only increase the operational resources for effectively targeting the ATMA activities but also will help national schemes to meet their objectives and make ATMA sustainable in the long-run.
- *Allowing Implementation Flexibility and Innovation to Reach the Unreached* — Further innovations are needed in extension services for reaching the unreached. The formation of farmer groups and introduction of the concept of farmer friend is a good start. However, these mechanisms as implemented currently, do not guarantee total inclusion of smallholder, marginal, resource-poor, and women farmers. Allowing new models that are context-, commodity-, agro-ecology-, and

market-specific to emerge based on the local needs that engage different groups of farmers, should be encouraged. Flexibility in experimentation and implementation of the reform packages is needed not only at block and district levels, but also at the state level.

- *Increasing Integration by Choosing Appropriate Lead Departments* — Integration of line departments continues to face challenges at the district and block levels. The choice of the lead department, at least at the district level, should be based on the agro-ecology of the district and contribution of various commodities to the district economy. The choice of DOA as the lead department for ATMA may not be appropriate in a district where, for example, horticulture or animal husbandry dominates in its contribution to rural livelihoods, especially in states where these are not under the direct control of DOA. This aspect requires serious policy consideration.
- *Increasing Accountability for Better Research-Extension Linkages* — Improving research-extension linkages will require transparency and accountability that goes beyond written documents. For example, research priorities identified by the ATMA in consultation with farmers and approved by IDWG at the state level, need to be reflected in the research priorities of the SAUs and the ICAR research institutions. Such priorities need follow up and the solutions from research must reach the farmers. This flow of problems and solutions needs effective monitoring by the FACs at all levels. Transparency and sharing of such information by making them public through the ATMA websites is the first step towards accountability.

Human Resource Development

- *Developing a Human Resource Development Strategy* — Investing in personnel building capacity is seriously needed at all levels to make the extension reforms effective at different levels. It is not enough to train the extension functionaries in the new extension process. They need additional skills to be able to generate innovation in the system and address the newly emerging problems with area and context specific solutions. The institutional and organizational capacities need

further strengthening at the block, district, and state levels. There is also the need to develop the capacity of farmers involved in the ATMA committees to make them effective members. A revised human resource capacity development and management strategy is also needed.

Public-Private Partnerships

- *Going beyond Technology Transfer* — Going beyond the current linear technology transfer mode of extension requires a pragmatic and programmatic approach to the delivery of extension services. For example, development of the value chains will require technical expertise that goes beyond the capacity of the current extension functionaries. While they need to be trained for such innovations, hiring experts at the district and block levels to provide such services will help in the involvement of the private and NGO sectors in extension advice and delivery to support the farmers. A strategic approach to effective involvement of private and NGO sectors expertise is needed.
- *Involving Private Sector through Better Partnerships* — The public-private partnerships need further nurturing in agricultural extension services. The role of private dealers of inputs and the operators of agriclinics in advising farmers could be made more effective by improving their capacity at the district levels. Specific courses before beginning of each crop season may be needed to equip them to meet the farmers' needs. The SREPs and SWEPs should reflect these needs and the DAPs and BAPs should budget for such training activities.

Communications

- *Developing a Communications Strategy for Extension Reforms* — Increasing the use of ICT in reaching the farmers through use of mobile phones, better internet connections and context and locality-specific portals could be useful tool to support extension. The SAUs should play an important role in converting their research results into readily available information for farmers. The use of community radio and television stations to develop locality-specific agriculture-related programmes could be effective in providing

knowledge and information to smallholder farmers. However, specific strategies for effective use of modern communications methods to support knowledge intermediaries are needed.

Financial Sustainability

- *Developing and Communicating a Long-term Financing Strategy*—Reducing uncertainty in the funding levels and making the states understand the expectation of the central government will be important for ensuring better ownership of the extension reforms by the state governments, which presently see ATMA as a centrally sponsored scheme rather than an autonomous institution. Allowing them to experiment and use resources innovatively will help in increased ownership of the extension reforms. The ‘scheme’ perception of extension reforms need to be removed and efforts to mainstream them with the state extension system will ensure the sustainability of extension reform measures. A long-term strategy for guiding the financing of the reforms is needed.

Monitoring and Evaluation

- *Moving from Activity Monitoring to Evaluating Outcomes for Learning and Change*—Monitoring and evaluation of the extension reforms should go beyond activity monitoring to output, outcome and impact. Rewarding the states with total ownership and making them innovative will require an effective monitoring system. Independent evaluation of the state level ATMA should be based on choosing the evaluators through an open bidding system and the evaluating entity must be directly accountable and paid by the central government. A revised monitoring and evaluation strategy is needed for an effective “learning and change” process.

Finally, there is the need to understand the political economy of extension and research reforms as they involve several stakeholder groups. The centre-state relations in resource-sharing, priority-setting, and reporting-mechanisms need better transparency. The role of DOA in making effective use of central government’s support through ATMA needs to be studied further. While there has been some success in pushing forward the reform measures, removing

constraints that hinder effectiveness of the reforms is the immediate concern.

Conclusions

This paper has presented the current status of the agricultural extension and associated research system reforms in India. The reform measures need to be fully understood for their organizational, structural and implementation challenges before they could be assessed for achieving their impact on farm productivity and other welfare measures. Using the case study of four Indian states, several organizational performance challenges related to the extension reforms have been identified. Comparing the lessons emerging from these four case studies, has presented several policy and program suggestions for improving the functioning and sustainability of extension reforms.

While the broad objectives of decentralization and farmers’ participation have been achieved, the reforms fall short in terms of increased accountability to farmers and being fully demand-driven. Inclusiveness of smallholder and marginal farmers has been achieved only partially. The group approach to extension remains weak and needs strengthening at the block and village levels. While the reform measures provide opportunities to the states in terms of flexibility, adaptability, and learning and thereby leading to the sustainability of reformed system, huge gaps in organizational and human capacity suggest the need for long-term capacity development strategy. The monitoring and evaluation system needs to go beyond process monitoring to the provision of inputs for learning and change. Incentives for motivating and retention of human resources need further attention to strengthen the current fragility of the system.

Effective synergies need to be established with the ongoing agricultural interventions in the form of national missions for both sustainability and leveraging the limited resources available for extension. This will improve both allocative and operational efficiency of the extension system and the Department of Agriculture at the state level. Increasing the effectiveness of the extension system in meeting its objectives will require readdressing of the above policy and programmatic interventions. Finally, the financial dependence of the states on central government needs to be gradually reduced to enable the states, and ultimately the farmers, to take ownership of their reformed extension systems.

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