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Reforming India's Pluralistic Extension System: Some Policy Issues

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Abstract

The agricultural sector in India has been successful in keeping pace with the rising food demand of a growing population. Rapid agricultural growth continues to be the key to poverty alleviation and overall economic development. The changing economic scenario in India and the need for appropriate agricultural technologies and agro-management practices to respond to food and nutritional security, poverty alleviation, diversifying market demands, export opportunities and environmental concerns is posing new challenges to technology dissemination systems. Public extension by itself can no longer respond to the multifarious demands of farming systems. There is need to reevaluate the capacity of agricultural extension to effectively address the contemporary and future needs of the farming community. Public funding for sustaining the vast extension infrastructure is also under considerable strain. Meanwhile in response to market demand, the existing public extension network is inexorably being complemented, supplemented and even replaced by private extension. As the nature and scope of agricultural extension undergoes fundamental changes, India looks for a whole new policy mix that nurtures the pluralistic extension system in India. The current study tries to analyse in-depth the various issues of pluralistic extension system in India and the policy reforms carried out to address them.

KEY WORDS: EXTENSION REFORMS, PLURALISTIC EXTENSION SYSTEM, INDIA, POLICY ISSUES, ATMA MODEL, MARKET-LED EXTENSION

INTRODUCTION

The agricultural sector in India has been successful in keeping pace with the rising food demand of a growing population. Rapid agricultural growth continues to be the key to poverty alleviation and overall economic development. Agriculture accounts for about 20% of the Gross Domestic Product (GDP) and is the source of livelihood for nearly 50% of the total population. The Green Revolution was the keystone of India's agricultural achievement, transforming the country from one of food deficiency to self-sufficiency. While recognizing the impact of the Green Revolution in energizing the agricultural sector, it must be recognized that the Green Revolution remained restricted to the well-endowed, irrigated areas of the country.

Recently, deceleration in production and productivity growth in some of the major irrigated production systems, especially in the north and northwest regions, have been recorded. However, potential production in the eastern and central states is still lagging behind in productivity. Moreover, in the area of agricultural research, success has been restricted to certain crops. Even in this arena, a growing disparity between the actual and the potential yields points to a crucial gap between research and extension. Public research and extension played a major role in bringing about the Green Revolution, however, in the post Green Revolution era, extension faces important challenges in the areas of relevance, accountability and sustainability.

The changing economic scenario in India and the need for appropriate agricultural technologies and agro-management practices to respond to food and nutritional security, poverty alleviation, diversifying market demands, export opportunities and environmental concerns is posing new challenges to technology dissemination systems. It is expected that future agricultural growth will largely be brought about by improvements in the productivity of diversified farming systems with regional specialization and the sustainable management of natural resources, especially land and water. Effective linkages among production systems with agro-processing and other value-added activities, including marketing will play an increasingly important role in the diversification of agriculture.

Public extension by itself can no longer respond to the multifarious demands of farming systems. There is need to reevaluate the capacity of agricultural extension to effectively address the contemporary and future needs of the farming community. Public funding for sustaining the vast extension infrastructure is also under considerable strain. Meanwhile in response to market demand, the existing public extension network is inexorably being complemented, supplemented and even replaced by private extension. As the nature and scope of agricultural extension undergoes fundamental changes, India looks for a whole new policy mix that nurtures the pluralistic extension system in India.

POLICY FRAMEWORK FOR AGRICULTURAL EXTENSION

Agricultural extension plays a crucial role in meeting the holistic needs to increase agricultural production in a sustainable manner. Reforms in the system envisage a

pluralistic extension system that is more broad-based and holistic in content and scope—beyond agricultural technology transfer. Its normal task of transferring and disseminating appropriate technologies and agronomic practices will not be sufficient. Extension agencies, services and workers will need to exercise a more proactive and participatory role, serving as knowledge/information agents in which they initiate and facilitate mutually meaningful and equitable knowledge based transactions among agricultural researchers, trainers and primary producers. All this needs to be done in an effective and cost efficient manner. Technology generation and its application will have to focus more strongly than before on the themes of optimization of resources available to producers, sustainability and adaption of technology to cope with diversity. More specifically, agro-ecological or social circumstances are aimed at the creation of a policy environment that promotes profitable, productive and sustainable farms. Reforms in agricultural extension have been initiated and are to be undertaken on a wider scale, which will be discussed under the following sub-heads.

Policy Reforms

Farming Systems Approach

Policy reforms in agricultural extension envisage replacement of the old single-discipline, commodity-oriented approach of the Training and Visit (T&V) system by the farming systems approach. The farming systems approach considers the farm, farm household and off-farm activities in a holistic way to take care of not only farming but all aspects of nutrition, food security, sustainability, risk minimization, income and employment generation, which make up the multiple objectives of farm households. This approach considers interdependencies of the components under the control of members of the household, as well as how these components interact with the physical, biological and socio-economic factors not under the household's control. The farming systems approach emphasizes that research and extension agendas should be determined by explicitly defined farmers' needs through an understanding of existing farming systems rather than the perceptions by research scientists or extension functionaries.

Multi-Agency Extension Service

Earlier, agricultural extension was considered to be a monopoly of the public sector. However, with the wide range of demands for agricultural technology in changing scenarios there is a growing recognition that public extension by itself cannot meet the specific needs of various regions and different classes of farmers. The new extension regime recognizes the need for multi-agency collaboration to combine strengths. The policy environment will promote private extension to operate in roles that complement, supplement, work in partnership and even substitute for public extension. The three arms of the agricultural extension network are:

Public Extension and Research Services

- State government line departments, including the Departments of Agriculture, Horticulture, Livestock Development, etc., as well as the Agricultural Technology Management Agencies (ATMAs) at the district level and the Block Technology Centers (BTCs) and Farmer Advisory Committees (FACs) at the block level;
- Indian Council of Agricultural Research (ICAR), including the State Agricultural Universities (SAUs), which have Directorates of Extension, as well as Zonal Research Stations, plus Krishi Vigyan Kendras (KVKs) and Krishi Gyan Kendras (KGKs) at the district level, plus Agriculture Technology Information Centers (ATICs) and Institute Village Linkage Program (IVLP).

Private Extension Services

- Agri-clinics and agribusinesses
- Input suppliers/dealers selling pesticides, seeds, nutrients and farm implements; and the
- Corporate sector (i.e. commercial crops like tobacco, tea, coffee, oilseeds (sunflower) and vegetables; plus farm implements—tractors, threshers, sprinklers, drip irrigation; etc.).
- Community based organizations, including farmers' organizations, farmers' cooperatives as well as farmer interest groups (FIGs) and self-help groups (SHGs)

- Para extension workers, including contact farmers and linking these farmers to: *gopals, mitra kisans, and mahila mitra kisans.*

Mass Media and Information Technology

- Print media-vernacular press
- Radio, television and private cable channels
- Electronic connectivity through computers, NICNET, internet and V-SAT
- Farm Information and Advisory Centers (FIACs)
- Private portals
- Public and private information shops

Public Extension Services

Despite the private sector's rise in providing agricultural services, the public extension system will gravitate towards selected regions, crops and sectors where profits can be gained. Pure public goods, and especially small and marginalized farmers as well as landless laborers, will not attract the "for-profit" private sector. Public extension will, therefore, continue to play a central role in technology dissemination. For example, public extension should focus its efforts on those knowledge-based technologies that are central to farmers' concerns and that will maintain the natural resource base. These are the subject matter areas that are not likely to be taken by the private sector. Examples include: dissemination of production management technologies that are specific to different crops and livestock systems; natural resource management (NRM) technologies, such as soil and water management, integrated pest management (IPM), agro-forestry and other technologies associated with sustainable development; and farming systems technologies, including farm management skills that will enable farmers to improve their efficiency, increase cropping intensities and to diversify into more high-value crop and livestock systems that conform with marketing trends.

Promotion of Farmer-Participatory Approach

There is a need for more farmer participation in developing a system of description, problem diagnosis and searching for appropriate technology, as well as the implementation process, monitoring, evaluation and feedback. The extension agent is no longer seen as the expert who has all the useful information and technical solutions. The indigenous technical knowledge of farmers and their ingenuity—individually and collectively—are recognized as a major resource, and the solutions to local problems should be developed in partnership between extension agents and farmer groups. Extension workers therefore need to acquire new skills in negotiating, resolving conflicts and mobilizing and nurturing community organizations.

Promotion of Demand-Driven and Farmer-Accountable Extension

Under the T&V system the technology dissemination regime was more “supply-driven.” Research and extension agendas were pre-set based on technologies for high-yielding, wheat and rice varieties. An important reason why research and extension organizations have not focused on farmer problems is due to the lack of an effective feedback system. The vast majority of small and marginal farmers in India, especially women, lack an effective voice in influencing research and extension priorities. Under the new policy, a demand-driven extension system will be created by providing farmers with access to linkage mechanisms through which they would be provided all relevant information/data to help them articulate their problems and needs in relation to their production and marketing plans.

A key factor in improving these feedback systems is organizing farmers into functional groups—such as SHGs, FIGs, Commodity Associations (CAs) and other types of Farmer Organizations (FOs). These FOs can provide an effective channel for (i) the dissemination of technology to large numbers of small and marginal farmers and (ii) giving feedback to research and extension. Linkage mechanisms would also ensure meaningful farmer representation in the governing bodies of public and private extension services, farmer influence on planning decisions, implementation and monitoring of public extension (at the local, block, district and regional levels) and farmer influence on incentives for extension staff, including supervisors and subject matter specialists (SMSs).

Thrust on Market Extension

Farmers have increasingly begun to perceive marketing, rather than production, as the major constraint in enhancing their farm incomes. With extension agencies primarily focusing on production techniques, marketing has not yet received much attention. This situation takes on greater significance in light of the new international trading regime under the World Trade Organization (WTO) and the export opportunities being opened up. Public extension functionaries are presently ill-equipped to deal with the need to focus on agricultural marketing in extension. India's multi-agency extension service will need to address marketing through strengthening the capacity of the public extension system, as well as supporting the private sector and making extensive use of media in information and technology dissemination. Marketing, which has so far been a peripheral issue in the extension scenario, will need to be brought center-stage. Indeed, production will now need to be significantly dictated by market requirements.

Enabling Farmers with Problem Solving Skills

Under new allowances there will be a paradigm shift from disseminating technology in a top-down, widely-applicable manner towards providing producers with the knowledge and understanding to solve their own location-specific problems. This means that the existing public extension systems should improve their efficiency and effectiveness toward research and technology application. This will call for an interdisciplinary approach aimed at location-specificity in technical solutions.

Encouraging Private Sector Involvement in Technology Transfer

Public service agencies provide subsidized agro-goods and services that are a significant deterrent to the expansion of private sector involvement in technology transfer, because this often leads to the creation of an uneven playing field and discourages market entry by private sector providers. Wherever possible, such subsidies will be phased out in order to stimulate the emergence of a private input supply networks to provide hybrid seeds, artificial insemination services, fertilizers, agro-chemicals, animal feed, machinery, equipment and other agricultural supplies and services to farmers on a full cost-recovery basis. Generally, the costs associated with the research, development and transfer of these material technologies are embodied in the prices of these products. Therefore, farmers

cover these costs when paying for the products, making this component of the Agricultural Technology System (ATS) financially sustainable. Targeted subsidies may be retained to protect the interest of the poor and vulnerable sections.

In the field of material technology dissemination—which includes distribution of inputs such as fertilizer, seed, planting material, chemicals for plant protection and agricultural implements—a competitive, private sector has developed in almost all states except for the northeastern states. This new policy envisages withdrawal of the public sector from areas where agro-services can be effectively and competitively provided by the private sector. In such cases, the role of the public sector becomes one of facilitator and enabler. Such a system dictates moving towards a realistic system of cost-recovery for agro-services by the state. If the public sector continues to subsidize these services, this will prevent a “level playing field” in which the private sector can operate. There will need to be a re-examination of existing rules, regulations and acts to abolish provisions, which constrain private investment in the delivery of agro-services.

Public Funds for Private and Non-Governmental Organization (NGO) Extension Services

Promotion of private extension needs to be matched by corresponding shifts in the allocation of public resources. Short-term public funds could be made available on a short-term basis to NGOs, farmer associations, para-professionals or private foundations for extension work. An environment, in which private investment in technology generation and transfer is more attractive, will have to be created.

Charging for Extension Services

Emergence of a market for private extension advice or consultancy services will be encouraged. Processors with contracted producers, commercial suppliers of seed, agro-chemicals, machinery, vaccines, artificial insemination and the like should be able to recover the costs of providing advice to their clients out of profit margins. However, vulnerable groups will still need to be protected through targeted subsidies and safety nets.

Institutional Restructuring

No uniform extension system will serve as a panacea to all states. Even within states there will be a combination of various agencies and different institutional arrangements to address the needs of different agro-climatic zones as well as different groups of farmers. However, public extension will continue to remain central to the intensification and diversification of farming systems, especially for small-scale and marginal men and women farmers, especially in economically-challenged regions.

A key aim is to decentralize decision-making and bring it to the district level through the creation of the ATMA—a registered society. A second goal is to increase farmer input in program planning and resource allocation, especially at the block level, and to increase accountability to stakeholders. A third major goal is to increase program coordination and integration between departments so that the following program directions can be more effectively and efficiently implemented, including:

1. **Farming System Innovations**—especially in diversifying into high-value commodities and/or value-added marketing and processing activities
2. **Creating Farmer Groups and Organizations**—especially for high-value commodities and for resource-poor men and women farmers
3. **Addressing Technology Gaps**—in both crop and livestock production systems
4. **Natural Resource Management**—especially soil and water management, and the reduction of pesticide use through IPM programs
5. **Marketing and Agro-Processing Linkages**—between farmers’ groups, markets and private processors

Developing Strategic Research and Extension Plans (SREPs) by first carrying out Participatory Rural Appraisals (PRAs)

In the process of creating a more bottom-up extension system, PRA procedures should be carried out across all system levels (i.e. district, block/mandal and village) and across all participating line department [Department of Agriculture (DOA), Department of Horticulture (DOH), Department of Animal Husbandry (DAH) and Department of Marketing (DOM), etc.]; and across research institutions [Zonal Research Stations (ZRSs) and KVKs] within each district. On the basis of conducting a PRA, then the

SREPs should be prepared for each district. Also, each district's SREP must be grounded at the block/mandal level, where extension programs can be fine-tuned to the needs of both men and women farmers and more effectively implemented. The SREP would take into account the research, training and extension requirements for production as well as marketing activities. The rural periodic markets and wholesale assembling markets, where farmers visit regularly, would be used as important locations for disseminating market and production technologies.

Block-Level Technology Center (BTC) for Single Window Extension System

The concept of a BTC has emerged wherein a multidisciplinary technology team (comprised of block-level agriculture, horticulture, soil and water conservation, agricultural marketing, and livestock extension officers) would be assigned to organize and implement extension programs within each block. Other line department units and personnel would continue to provide essential extension services in developmental activities. In effect, the BTC would result in the functional integration of extension activities within the block and become the operational arm of ATMA. The BTC would become the common meeting point for extension personnel from the line departments to prepare integrated work plans (WPs) and to coordinate their implementation. It would also be the level where farmer input could be more effectively mobilized through single FACs. These FACs would include 10 to 12 members (30% women farmers) representing all major stakeholders within each block. The FAC would help in setting the block's extension priorities and recommending resource allocation across program areas. The Block Technology Team (BTT) would be responsible for operationalizing the SREP in each block and then moving toward a single window extension system.

Upgrading and Restructuring the Extension Staff as Farm Advisors

The Department of Agriculture's (DOA's) extension field staff would be restructured and upgraded to create a professional cadre of farm advisors. In the process, Village Extension Workers (VEWs) are being phased out through reassignment and normal attrition. Eventually, these farm advisors would be in charge of all extension activities within the block, and they would all be required to meet a minimum educational requirement for service entry (e.g. B.Sc. in agriculture, horticulture, livestock, etc.). In

addition, the project should provide in-service training on new planning, diagnostic and technical skills. By the end of this activity, this new cadre of extension professionals should be able to identify and provide demand-driven advice for most farmer problems.

First, they should be able to carry out a systematic needs assessment to prioritize farmer problems. Then, by utilizing the strengthened cadre of research and extension specialists (SMSs) within the district, they would be expected to organize and deliver a broader range of extension and farmer training programs. In addition, these upgraded farm advisors would be expected to formulate and target location-specific recommendations. Also, the SMS cadre at the district level would be expanded and strengthened to support the primary production and farming systems by supplying market related information to the producers. To facilitate the collaboration between line departments and the district level, SMS positions would remain within each development department, but their extension activities would be coordinated under the ATMA framework.

Group Approach to Extension

The contact farmer approach to extension, popularized by the T&V system, is to be replaced by the group approach. NGOs can help form and mobilize Farmer Interest Groups (FIGs, primarily men) and SHGs- primarily women), which will then merge into farmer cooperatives. A group approach to extension will help replace the top-down approach to a more bottom-up approach in technology transfer. FIGs and SHGs will first generate the demand for information, technology and/or management techniques and then extension workers would respond to these different group demands. This would lead to a farmer and extension worker participatory process with emphasis on problem solving rather than disseminating routine messages. The group approach in extension would share similarities with these FIGs/SHGs for rural credit delivery, as well as water use associations and cooperatives.

Strengthening Research-Extension-Farmer Linkages

There is a need for close interaction between farmers, extension workers and researchers in diagnosing problems and working out location-specific recommendations that emphasize 1) participatory education rather than prescription and 2) joint actions in the field. Accepted to be more knowledge intensive, these new recommendations will require

greater skills—both to develop and to apply. There will be strengthening of research-extension-farmer linkages not only at the state levels (i.e. SAUs and SAMETIs), but also at the district level (ATMAs and KVKs). Not only will linkages be strengthened between the Department of Agriculture (DOA) and SAUs, but also among Department of Horticulture (DOH), Department of Sericulture (DOS) and Department of Animal Husbandry (DAH), etc. as well as on-farm land and water management in the farming systems approach with due coverage of agricultural marketing concerns. The research-extension interface at all levels from the block to the district level will be supported. Widening the range of extension delivery services for resource-poor farmers and those residing in the hilly, tribal and remote areas, the public system will have to remain the chief extension mechanism, with help from NGOs, possibly being able to play a significant role by first organizing different FIGs/SHGs, depending on access to land.

ICAR's Role in Extension—Better Linking KVKs to Dept. of Agriculture and Cooperation (DAC)

The primary mandate of ICAR is research and its extension programs should be limited to reinforcing research activities to make them more demand driven and farmer centric. The major activities of the agricultural extension division are assessment, refinement and demonstration of technology/products through a network of 630 KVKs. There are 44 ATIC established under ICAR institutes and SAUs to deliver knowledge through a single window system. Hence, KVKs should continue to operate in proactive mode, retaining their allegiance with the 603 ATMAs, for project implementation activities. Apart from focusing on production related issues, KVKs should address different components of marketing and make need-based packages available, taking into account the changing agricultural marketing scenario. In short, links with KVKs should be strengthened at the district level, especially through ATMAs.

Improving Research-Extension Linkages

Promotion of a Direct Interface between Farmers, Extension Workers and Researchers

The direct interaction between researchers and farmers is the most ideal educational interface and should be undertaken wherever possible. It is an oft-repeated refrain that

farmers learn best from scientists and other successful farmers, however, transmission losses are minimized in direct interface. However, there are relatively high costs attached to this direct mode of “technology transfer” and the outreach of scientists is limited. Punjab Agriculture University has achieved significant success through this system, but it must be noted that Punjab is a small state geographically and with very progressive farmers. Therefore, what is applicable in the Punjab may not be possible in larger, poorer states, such as Uttar Pradesh, Madhya Pradesh, Bihar and Orissa.

Setting Research Priorities Based on SREPs

Micro-level extension strategies reflected in the SREPs are based on PRAs and developed jointly by the district technology teams, including the extension officials (crops, livestock, marketing, etc.), as well as scientists from the KVKs and Zonal Research Stations (ZRSs) and/or SAUs. These strategies should serve as formal input into the research (and extension) systems through a mechanism that sets research priorities in ICAR.

Capacity Building of Extension Workers

Formulation of Human Resource Development (HRD) Policy by States

Central government support for HRD in agricultural extension would be available to the states only after the formulation and adoption of a HRD policy and action plan through a systematic, skill-gap analysis. Such a policy would incorporate compulsory training and skill development for all extension workers. It would also build in an effective incentive system for public extension workers.

Formulation of a Training Plan for Extension Workers

A long-term training plan should be developed by each state based on a thorough skill-gap analysis. A massive campaign will need to be launched for skill development and capacity building of extension functionaries using the resources of all training institutes. The training should be divided into courses comprising skill development in (i) needs assessment techniques, including PRA, (ii) FIG and SHG formation, (iii) development of entrepreneurial skills for agri-business, (iv) agri-business management, (v) marketing of agricultural products, (vi) post-harvest management, (vii) conflict resolution and

negotiation between different interest groups, (viii) management of common property resources, (ix) use of different types of media and communication, as well as (x) project preparation and data collection, analysis and documentation. Foundation Extension Courses should be conducted jointly with senior extension workers at State-Level Extension Management Training Centers (SAMETIs) and SAUs. Technical Courses could also be conducted at SAUs and Centers of Excellence at the ICAR Institutes in various subject matter disciplines. National and state-level agricultural education institutions will need to be reoriented in view of these changing requirements.

Upgrading State-Level Agricultural Management Extension Training Institutions (SAMETIs)

The central government should also support state governments in upgrading and restructuring their top state-level extension training institutions in order to respond to the changing requirements of extension, training and communications management. These improved, state-level institutions should have strong institutional links with the National Institute of Agricultural Extension Management (MANAGE), Hyderabad as well as the National Institute of Agricultural Marketing (NIAM), Jaipur and function as the state arms of the national-level institute. Structural changes—in the form of providing greater autonomy to these SAMETIs—would be a pre-condition of support from government of India. Use of mass media communication techniques will be developed to convey messages about available technologies. Appropriate curricula will be developed to train field staff, with a major focus placed on marketing related issues.

Empowerment of Farmers

Involving Farmers in Setting Extension's Agenda

As major stakeholders, farmers will be ensured representation in all decision-making bodies of public and private extension services. Farmers will be involved in the planning and implementation of extension programs through formal institutional mechanisms such as ATMAs at the district level and Farmer Advisory Committees (FACs) at the block level. By ensuring that all programs in the field (i.e. FACs) are planned and implemented

through these farmer groups (FIGs and SHGs); then farmers would be able to influence both administrative and financial decisions at the block (i.e. FIACs) and district (ATMA) levels.

Acquisition of Skills by Farmers

Training and acquisition of skills by farmers is a central part of a pluralistic extension system because of the new practices involved in farming systems. Greater focus will be provided on (i) assessing farmers' needs and skills; (ii) distinguishing different dimensions of training such as awareness, knowledge, skills and reinforcement, as well as using appropriate channels and methods for each; (iii) determining different kinds of technologies and advice required and transfer mechanisms (i.e., face-to-face, mass media) preferred during different phases of awareness, trial and adoption of new skills and technologies by different categories of male and female farmers; (iv) using information technology for improving the quality, acceleration, transfer and exchange of information; (iv) organizing training programs on system based and sustainable technologies, such as IPM and Integrated Plant Nutrient Management (IPNM); and (v) organizing training and capacity building in agricultural marketing for farmers. Capacity building and skill trainings for farmers would be conducted through farmers' field schools with the active participation of both scientists and extension personnel.

Establishing Women in Agriculture

Gender concerns need to be addressed in the agricultural extension process. Public extension systems, which must disseminate new technology and information, are still largely male-dominated. Hence, there is a need to ensure that women receive information relevant to their work—particularly, with reference to particular crops, livestock and other products that they can jointly produce and market within villages, blocks, districts and regional centers. In short, many rural men are now migrating to urban and peri-urban areas, leaving rural women to spend more time producing a range of agricultural products, including high-value crops (e.g. vegetables), livestock (e.g. poultry and cows), fish and other products (e.g. sericulture and mushrooms).

Improving Access to Extension and Training

Female farmers have usually been neglected in extension efforts. Gender inequality had not been addressed by the agricultural extension system in the past. However, with the changing scenario, the need for innovative changes in extension approaches has assumed center stage. Innovative efforts will need to be made both by the state and local governments to improve extension services to reach rural farm women through (i) extension policy that explicitly recognizes farm women as agricultural extension clientele; (ii) training for male and female extension staff on women's roles in agriculture and rural development, and how agricultural extension work could be organized and conducted to meet women's needs in agriculture and rural development activities; (iii) training for women on decision-making in the context of farm and home management; (iv) trainings for female farmers on agricultural marketing (particularly with respect to post-harvest processing) on farm-value addition and market requirements/demands.

Redesigning Extension Services to Reach Women Farmers

Extension services are being redesigned to focus on women through (i) conducting appropriate training/sensitization of extension personnel towards the role and contribution of women in the total agricultural system; (ii) increasing the proportion of trained female extension workers to ensure that at least one-third of all extension workers are women; (iii) sensitizing male extension workers to the needs, approaches and perspectives of women through appropriate training and orientation programs; thereby dispelling the notion that only female extension workers can address extension needs of rural farm women; (iv) improving communication between women, researchers, marketing agencies and extension workers required for the development of technologies best-suited for women; and (v) developing appropriate extension methodologies that recognize the multi-dimensional role of women and the socio-cultural barriers in which female farmers operate in a rural society.

Expanding the Sphere of Women Extension Workers

The number of female agricultural extension workers should be increased through (i) re-examining all service cadre rules for hidden gender biases; (ii) increasing female attendance at agricultural institutes and schools; (iii) building incentives such as

scholarships and stipends for more women to take up undergraduate and post-graduate courses in the agricultural and allied sciences; (iv) redesigning agricultural training curricula to include women's concerns; (v) ensuring that women are adequately represented in all training programs whether domestic or overseas; (vi) redesigning training facilities to make them more suitable for large numbers of female students and trainees; (vii) including greater analysis and extension methodology that take into account women's time, mobility and cultural situations in the teaching curricula for extension workers; and (viii) exploring the specific role of farm women in the marketing of agricultural products.

Use of Information Technology (IT)

The IT revolution is unfolding and has very high visibility. Harnessing IT for agricultural extension should receive high priority in the new extension policy. Extensive use of modern IT should be promoted for communication between researchers, extension workers and their farmer clients to transfer technology and information more cost effectively. IT should be made available, particularly to those with specific inquiries, to guide them in adopting the more knowledge-intensive forms of agriculture, which will expand in the future.

Information Technology Applications in Agricultural Marketing

Agricultural marketing requires connectivity between the market and exporters, growers, traders and industry consumers through wide area networks of national and international linkages. The goal will be to provide day-to-day market information regarding commodity arrivals, prevailing rates, etc.; links for online international market information; export-related documentation; information on the latest research in agricultural marketing and packaging; and storage information and connectivity with lead international and national marketing organizations.

Wider Use of Electronic Mass Media for Agricultural Extension

Radio and TV have vastly increased their reach, as have their reception facilities. "Local" radio and new FM transmitters open up possibilities of area-specific broadcasts. In

communicating with an audience with low literacy skills, an audio-visual medium like TV has advantages. Today, Doordarshan covers the entire population. Much wider and creative use of the mass media—All India Radio (AIR), private FM, Doordarshan, private cable networks—will be promoted for more rapid and effective dissemination of information and technical advice to farm communities. This will include market information; market-led production planning, on-farm and post-harvest management, value-added agriculture, e-contracting, market networks, market intelligence and wider application to the Internet. Face-to-face contacts should serve as a follow-up to these methods of information dissemination, not precede or substitute for them. Central government will support states in their efforts to make greater use of electronic media. Central government would also consider supporting an exclusive agriculture channel on television.

Farmer Participation in IT Programs

In developing any system of IT for agriculture technology transfer, the farmer should be kept as the central focus. She/he is not to be treated as a passive recipient but, rather, as a participant, generator and user of knowledge. The development of his/her skills and knowledge is therefore a crucial part of the process. The farmer will be an effective participant in the process.

Private Information Shops/Kiosks

The ultimate aim is to promote private information shops/kiosks franchised out to the private sector, and they should be encouraged to establish information shops at the block/mandal/village level. A major initiative will need to be undertaken for software development so that information shops can have access to suitable material. Electronic connectivity and access to email would put the franchisees in contact with district KVKs, ATMAs, line departments, markets and other sources of information. Such information could be dispensed to farmers and farmers' groups upon payment. Credit facilities for purchase of equipment to set up such information shops would be permissible under the micro-credit program for agriculture and allied activities.

Financial Sustainability and Resource Mobilization

Publicly funded extension will continue to play a predominant role in intensifying and diversifying farming systems because the large numbers of small, disadvantaged farmers that may not have access to or be able to afford any other kind of advisory services. Second, much of the new technology developed for specific subject areas will not be commercially marketable (i.e., watershed management, land capability assessment, land use planning, breaking yield ceilings, sustainable management of natural resources and socio-economic research). However, pressures on government expenditures mean that public funds will have to be more carefully targeted and more efficiently used.

Cost-Cutting Mechanisms for Extension Services

Cost effectiveness may be improved by relying on fewer, but better qualified (graduate or post-graduate) field advisers who interact directly with researchers for subject matter advice and then multiply their impact in the field by working with farmer groups (i.e. FIGs and SHGs) rather than individually contacting farmers. Cost-cutting mechanisms will need to include use of mass media, encouragement of NGO and private-sector involvement in extension and/or needs-based coverage.

The Changing Role of Government

The Role of the State in Effective Regulation and Enforcement

As a multi-agency extension regime proliferates, the responsibility of the state for effective enforcement of legislation—which ensures quality control of inputs such as seed, pesticides, fertilizers, etc.—will increase. The state’s role as arbitrator of conflicts among various public and private-sector extension agents will also increase, and systems to address grievances will need to be developed. This role will increase as the number of private extension agencies grows. Guidelines for private agencies would be required. However, in the emerging pluralistic scenario, the role of public extension would need to be redefined from one of solely providing services, to one of an increasingly appropriate mix of service provider, coordinators, facilitators and regulators. The large group of small and marginal farmers, landless laborers and remote regions will continue to need the services of public extension functionaries since they are not likely to be serviced by a

competitive, private sector. Public extension's role would increase in the arbitration of conflicts, assuring all service providers are accountable to farmers and ensuring transparency by providing information.

Strengthening Farmers' Associations

Government services can help identify existing farmers' associations or cooperatives and support them in developing their organizations. The aim must be to assist the groups to define their objectives—such as specific post-harvest operations, ensuring group coherence and continuity, and assisting them with organizing and setting up group structures. Over time such groups can establish a track record of organizational maturity that will allow them, possibly after joining with other groups for economy of scale, to engage in their own business activities and to gain access to formal credit. Government extension and NGO staff need to receive suitable training to act as group facilitators. Support to farmers' organizations is perhaps the main input that governments can provide to promote farmer integration with agribusiness.

STRENGTHENING THE ATMA MODEL IN INDIA

Strategic Research and Extension Plans (SREPs)

The SREP is a comprehensive document identifying research/extension priorities for each district, keeping in mind agro-ecological conditions and existing gaps in technology generation and dissemination in all agricultural and allied sector areas/activities. SREPs will be prepared for new districts in coordination with the line departments, the KVKs, the Panchayati Raj Institutions (PRIs), the private sector, farmers and other stakeholders at the district level. These SREPs will be revisited every 3-5 years to accommodate newly identified gaps and merging areas of importance. SREPs will form the basis of annual Block Action Plans (BAPs) prepared at the block level. BAPs are then consolidated at the district level to prepare the District Agriculture Action Plans (DAAPs). District plans are worked out in such a manner that they serve as a subset of the Comprehensive District Agriculture Plan (CDAP) prepared for the districts under Rashtriya Krishi Vikas Yojana (RKVY).

One of the first tasks of the ATMA is to facilitate the preparation of a district SREP. The SREP is prepared through participatory methodologies especially the PRA involving all the stakeholders and farmers within the block and district. The SREP contains detailed analysis of all information on existing farming systems in the district and of research-extension gaps that need to be filled. It also prioritizes the research-extension strategies within the district. It becomes the basis for the development of work plans at block/district level. During the last decade a number of management tools have been developed that are helpful in effectively facilitating farmer involvement. Based upon these tools a participatory methodology has been developed for preparing the SREP at the district level.

The ultimate objective of both research and extension systems is to increase agricultural production. Formulating extension and research agendas based on the results producers expect from technology will be more acceptable to the users. This also helps in allocating resources to both extension and research activities undertaken in the district. Therefore, the SREP for each district needs to address specific problems of the farming community, especially for the resource poor farmers and the other disadvantaged groups.

Need for Strategic Planning in Agricultural Development

The current planning and implementation mechanisms for agricultural and allied development programs are centralized. This top-down approach focuses on individual commodities/enterprises rather than on a holistic/integrated approach. It is ad-hoc in nature and does not involve all participants. The farmers are considered as receivers of benefits rather than as responsible people who can influence the production process. To address the aforementioned issues under the “Extension Reforms Scheme,” district ATMAs are required to develop a SREP by involving all stakeholders.

The development and use of a SREP helps in the following ways:

- To get an overview of the prevailing scenario in the district.
- To explore and understand the problems and opportunities in different farming systems and the preferences and priorities of the farming community.

- To facilitate long-term visioning and strategic planning for agricultural development in the district in a concerted manner.
- To facilitate involvement of all players (i.e. men and women) at different levels in the development process; and, in the long run, share the load of the public extension system.
- To assist in integrating and redesigning the on-going developmental programs for the benefit of both men and women farmers.
- To develop annual action plans for each block in respect to the prevailing agro-ecological situation.
- To extend a farmer-centered, market-oriented extension-research management system.

Contents of SREPs

The extension and research interventions would differ across the Agro-Ecological Zones (AEZs) as a result of prevailing Agro-Ecological System (AESs)—defined by crops, livestock and farming systems (as affected by roads, markets, input supply outlets, service facilities) and by farm households as it reflects their resource endowment and socio-economic status. Therefore, in formulating a SREP, the following guiding principles should be kept in mind:

1. Identify and build on important farming system innovations or success stories that may intensify and/or diversify existing farming systems and, thereby, increase farm household income.
2. Increase farmers' access to markets, technologies and resources through men and women farmer's groups and organizations.
3. On-farm collaborative technology development, testing and refinement to address serious technological gaps in the existing farming systems.
4. Promote appropriate NRM plans for building and maintaining the sustainable production systems within each AES.

Steps Followed in Preparing a SREP for Each District (See Table 1):

- **Selection of Districts:** It should be kept in mind that each district should be an accurate representation of the agricultural sector for that state/province.
- **Selection of a Competent ATMA Project Director and Deputy Director:** The first task would be to select individuals from the Ministry of Agriculture (i.e. Departments of Agriculture, etc.) and the ICAR (i.e. University or KVKs) who have sufficient experience, knowledge and seniority to enable them to carry out responsible for all the activities listed below.

Table 1: Probable Timeline for Completing the SREP in Each District

Task	Likely Duration*
Orientation of district team	3 days
Identification of Agro-Eco Systems (AESs) within the district	3 days
Training of AES teams	7 days
Data collection through participatory approaches	15 days
Data analysis, identification and prioritization of research and extension issues	15 days
Developing strategies for research and extension issues in the district	5 days
Developing activity schedule	5 days
Approval and acceptance of SREP	2 days
Total time required to develop SREP	55 days

** Depending on local factors and the situation on the ground, this timing may increase or decrease somewhat*

- **Selection of ATMA Farmer Advisory Committee (FAC) at the block level:** Field officers drawn from different line departments like Agriculture, Horticulture, Animal Husbandry, Fisheries; etc. as well as scientists from the local research station and/or university, as well as selected NGO representatives and progressive farmers will learn about the participatory tools to prepare the ATMA SREP.

- **Training these FACs:** MANAGE and/or SAMETIs should carry out a training program in which inductive methods of learning and tools like brainstorming, group discussions and using scenarios would be used to help clarify the subject for participants, so that the SREP could be made more meaningful.
- **Selection of Agro-Ecological Zones (AEZs):** On the basis of important factors—like topography, soil type, water availability, annual rainfall/snowfall, types of vegetation and orchards/range lands, field and horticultural crops grown and sources of irrigation—different AEZs should be identified within each district for preparation of situation-specific, farmer-demand oriented SREP. Further, representative villages from each AEZ, based on various agro-ecological factors, will be identified. If any of these villages are found lacking in any particular enterprise, then the relevant information from an adjoining village should be collected for carrying out the SREP field exercises.
- **Formation of Multi-Disciplinary Teams for Each AEZ:** A team consisting of 5 to 6 members, which may include one officer from each of the major departments, one NGO representative active in that area, at least one scientist and one progressive farmer from that AES would be formed for each AEZ. These groups should be entrusted with collection of primary information from the representative villages using PRA techniques and participatory methods in preparing the SREP.
- **Secondary Information:** Secondary information would be collected by the government department officers using different government publications, progress reports and records of the district offices of agriculture, horticulture, livestock/animal husbandry, forestry, etc. as well as Cooperative Departments, the leading bank in that district, National Informatics Center (<http://www.nic.in/>) and other offices of the different ministries/department related to the agricultural sector.
- **Collection of Primary Information:** Field exercises would be conducted in the selected representative villages of each AES within each district where members of the multi-disciplinary team will identify issues, collect data and information using participatory methods. The team should spend a minimum of 7 days in these

villages in two phases (4 + 3 days) and judiciously use the participatory tools for the collection of field data. The primary data collected during this time will then be checked with various groups in the villages through triangulation and will be verified with other sources like secondary data collected from the departments.

- **Reviewing, Verifying and Sharing Data:** All AES teams should adopt a procedure to present the data collected by them to farmers in each village before leaving the village for final consolidation and sharing of information. The collected data should then be summarized and presented by each AES team in the presence of senior level officers and scientists from all relevant departments, the district heads of all departments and farmer representatives from each selected village. Some of these AES teams may need to again visit the villages to recheck the data and complete the missing links.
- **Development of an Activity Schedule by the Core District Team:** While strategies are long-term in nature, the individual activities are systematic steps taken to achieve these strategies. Ongoing departmental activities should connect and any missing links should be dovetailed by the project. Each strategy has to be translated into a set of activities, which will clearly spell out the size of units, total units required, cost per unit and total cost in respect to each activity.
- **Approval of SREP:** After thorough scrutiny by the team of officers, scientists and farmers, the SREP should be presented for approval as an authenticated planning document by the ATMA Governing Board (GB). This document will form the basis for agricultural development in the district.
- **Preparation and Implementation of Action Plans:** Keeping in mind the strategic thrust of SREP, annual/seasonal block action plans are prepared by the BTT/FAC in each block to facilitate technology dissemination using innovative processes—like exposure visits, technological and managerial trainings, demonstrations, field days, Information Technology (IT) support, etc.—with farmer groups. Simultaneously a research action plan consisting of on-farm trials is prepared and carried out in support of the research strategies spelled out in

SREP by the scientists of ZRSs and KVKs to assess and refine the existing generalized technologies.

- **Revisiting Strategies:** SREP development is a dynamic process, in which issues emerge during the course of implementation and are suggested by various stakeholders. Members of ATMA GB at the district level, and BTTs, FACs and FOs at the block level are made to address these Block Action Plans (BAPs). Hence, necessary steps are initiated to revise and redress the SREP in light of the challenges and issues arising during the implementation of the BAPs.
- **Information and Communication Support:** A conscious effort has been made to promote information and communications support to members of the farming community so that they can keep abreast of the latest developments regarding weather, market intelligentsia, packaging practices and success stories. Hands-on training for computer applications is being provided to the extension functionaries and farmer representatives through information kiosks at the block-level FIACs.
- **Success Stories:** Implementing the action plan in conjunction with SREP has generated “centers of excellence” among farmer groups and innovative farmers. With support of relevant technologies, inputs and markets, this epoch-making initiative in the National Agricultural Technology Project (NATP) within 28 pilot districts in India have brought about a sea of change in the working patterns and attitudes of the farming community. Its members are able to enhance farm income with diversification and intensification of their farming systems. The cascading effect of such innovations would go a long way in replication among other farmers.

STRENGTHENING THE STATE AGRICULTURAL MANAGEMENT AND EXTENSION TRAINING INSTITUTES (SAMETIS)

To meet the requirement of capacity building, a large number of training activities are needed in the areas of technical as well as human resource management in agriculture. SAMETI is a state-level institution that is autonomous with greater flexibility in structure and functioning and is responsible for organizing need-based training programs for the

project implementation workers of different line departments as well as farming communities. This can be achieved through linkages with other technical and management institutions in the state to support desired training input. SAMETI has to function with the technical guidance of MANAGE. SAMETI is to be an autonomous institution with greater flexibility in structural and operational aspects. Its roles are as follows:

- To provide need-based consultancy services to ATMA in areas like project planning, appraisal, implementation, etc.
- To develop and promote appropriate and specific management tools for improving the effectiveness of agricultural extension services through better management of human and material resources.
- To organize need-based training programs for district and block-level agricultural extension functionaries.
- To provide education on management, communication, participatory methodologies, etc. as a response to the feedback from training programs.
- To maintain close linkages with other institutions like MANAGE, KVKs, ZRSs, SAUs, and NGOs in order to make use of appropriate faculty resources from these institutions for training and consultancy services to ATMA functionaries, farmers and other clients.
- To conduct studies on problems related to agricultural extension management, communication and information technology, agricultural product marketing, human resource development using participatory approaches.

Strengthening the ATMA Work Force

Strengthening of the extension-related work force is proposed at three levels—state, district and block. The hierarchical structure of officials under the revised ATMA program is as follows:

State Level

- (i) State Agricultural Management and Extension Training Institute (SAMETI): In order to ensure regular training and skill development of state and district/block level extension functionaries and to reach out to the grassroots level extension functionaries and farmers through field visits, the following workforce is provided for SAMETI in each state. The Director of SAMETI will work under the overall guidance of the SNO identified under the ATMA scheme/program. However, in cases where the SNO is not an officer of equivalent or higher rank than the director of SAMETI, the director of SAMETI may work under the overall guidance of the officer under whom the SNO is placed. The faculty members (deputy directors) of SAMETI report to the director of SAMETI.
- (ii) State Nodal Cell: The state nodal cell will consist of the State Nodal Officer (SNO), the state coordinator and supporting staff. The SNO shall be designated by the state government, which will also provide requisite ministerial support. In order to carry out state-level activities as specified in ATMA, to ensure convergence with various departments at the state level and to assist the SNO (i.e., Director/Commissioner of Agriculture or equivalent) in overall management of the agricultural extension system within the state, one state coordinator has been approved for each state/union territory. The state coordinator will be engaged on a contract basis under this scheme/program.

District Level

Each ATMA unit consists of the following core staff of five people, under the overall supervision of the project director of ATMA, that are responsible for management of agricultural extension services within the district including holding of regular meetings of the ATMA management committee and the ATMA governing board:

1. Project Director – 1
2. Deputy Project Directors – 2
3. Accountant-cum-Establishment Clerk – 1
4. Computer Programmer/Operator–1

The project director of ATMA reports to the chairman of the ATMA governing board (GB) and the two deputy project directors would work under the administrative control of the project director of ATMA. The project director of ATMA also functions as the chairman of ATMA management committee (MC).

Block Level

- (i) One Block Technology Manager (BTM) is being provided under this scheme/program in each block to coordinate the ATMA-related activities of the BTT and the FAC. The BTM will work under the overall supervision of the BTT convener for all ATMA-related activities.
- (ii) Two Subject Matter Specialists (SMSs) are to be placed in each block exclusively for delivery of extension services in agricultural and allied sectors as per priority areas for various blocks. The areas of expertise of these SMSs will be decided on based on priorities for various blocks. The BTM and SMSs at the block level will be engaged by the project director of ATMA on a contract basis through a mechanism identified by the states. While the SMSs will remain under the administrative control of BTM, the BTM will work under administrative control of the project director of ATMA. However, some states may prefer to link the BTM and SMSs with the project director of ATMA through the Block Development Officer (BDO).

Village Level

It is necessary to identify and groom progressive farmers to act as focal points at the village level. A progressive farmer identified as a Farmer Friend (FF) will be placed at a ratio of one FF per two census-identified, inhabited villages. The FF will help in activating the much-needed, village-based, bottom-up planning process and serve as vital link between the extension system and farmers at the village level. The FF will lead by example and is expected to have improved skills and would be available in the village to advise on agricultural and allied activities. The FF will be engaged by the BTM on a resolution of Gram Panchayat, which will, in turn, consult with FIGs/SHGs working in the Panchayat area.

DEVELOPING FARMER ASSOCIATIONS (FAS), COMMODITY AND PRODUCER INTEREST GROUPS (CIGS AND PIGS) THAT ARE MARKET-DRIVEN, AS WELL AS FARMER INTEREST GROUPS (FIGS) AND SELF-HELP GROUPS (SHGs)

The contact farmer approach to extension popularized by the Training and Visit (T&V) system will be replaced by the group approach. Formation and mobilization of FIGs/SHGs, as well as farmer associations and cooperatives will be encouraged with the support of NGOs. The group approach to extension will help replace the top-down approach with a bottom-up approach in technology transfer, as FIGs/SHGs will first generate a demand for information, technology and management techniques. Then, these extension workers would then respond to the group demand. This would lead to a farmer-extension worker participatory process with the emphasis on problem-solving rather than disseminating routine messages. The group approach to extension would also be similar to the SHGs for rural credit delivery, water user associations and cooperatives.

Guidelines on How FIGs/SHGs Can Be Organized and Integrated into Farmer Associations (FAs), Federations, Etc.

- FIGs/SHGs should be promoted/mobilized for all major commodities (size is 20 to 25 men and/or women farmers).
- FIG/SHG members should meet at least once a month to discuss activities and future courses of action.
- BTTs and FACs will monitor functioning of all FIGs/SHGs/CIGs on a regular basis.
- FIGs/SHGs at the village level should be federated at the block level and subsequently at the district level.
- FIGs/SHGs should maintain proper registration and records (commodities, proceedings, savings, and accounts).

Other Interventions

Farmer Field School (FFS)

The FFS is based on a group-based learning process that has become an innovative, participatory and interactive model approach for farmer education. The approach has been used with a wide range of crops and has subsequently expanded to topics such as livestock, community forestry, HIV/AIDS, water conservation, soil fertility management, food security and nutrition. The aim of an FFS is to build farmers' capacity to analyze their production systems, identify problems, test possible solutions and eventually adopt the practices most suitable to their farming system. The knowledge acquired during the learning process enables farmers to adapt their existing technologies to be more productive, profitable and responsive to changing conditions or to test and adopt new technologies. FFSs provide the vital link between the progressive farmers and others in a village. Such farmers should be selected broadly, adhering to a transparent methodology of selection. These men and women farmers would normally be the ones who have been accepted by other farmers as high-achieving farmers for their success in adoption of new technologies, yield difference and income raised in agriculture and other allied sectors.

Comprehensive District Agricultural Plan (CDAP)

Another recent initiative to by Government of India has been through a new programme named as Rashtriya Krishi Vikas Yojna (National Agricultural Development Project) which emerged due to slow growth in agricultural and allied sectors. National Development Council (NDC), in its meeting held on May 29, 2007, resolved that a special additional central assistance scheme/program Rashtriya Krishi Vikas Yojna (RKVY) be launched and resolved that agricultural development strategies must be reoriented to meet the needs of farmers. It called upon central and state governments to create a strategy to rejuvenate agriculture and reaffirmed its commitment to achieve 4 percent annual growth in the agricultural sector during the 11th Plan.

The Department of Agriculture, in compliance with the above resolution and in consultation with the planning commission, has prepared the guidelines for the RKVY scheme/program, to be known as NADP/RKVY. For the planning process of RKVY,

each district will formulate a District Agriculture Plan (DAP) by including the resources available from other existing schemes/programs—district, state or central schemes. To rejuvenate agriculture during the next Plan, the NDC has reaffirmed its commitment to achieve a growth rate of 4 percent per year. As agricultural growth is an essential element of the strategy to make growth more inclusive, the NDC (in its resolution) advised the state governments to prepare a CDAP that will fully utilize available resources and will include allied agricultural sectors. The concept of a Block (or Mandal) Technology Center (BTC) has emerged wherein a multi-disciplinary technology team (comprising block-level agriculture, horticulture, soil and water conservation, agricultural marketing and livestock extension officers) would be assigned to organize and implement extension programs within their block. Other line department units and personnel would continue to provide essential services in developmental activities. In effect, the BTC would result in the functional integration of extension activities within the block, or mandal; and, in effect, it would become the operational arm of ATMA.

To bring better coordination in extension activities at block level and below, it is envisaged that this center would become the common meeting point for extension personnel from the line departments to prepare integrated Work Plans (WPs) and to coordinate their implementation. It would also be the level where farmer input could be more effectively mobilized through a single FAC. This FAC would include members of all major stakeholders (e.g. FIGs and SHGs) within each block. The FAC would help set block extension priorities and recommend resource allocation across program areas. The BTT would be responsible for operationalizing the SREP in each block and moving toward a single window extension system.

CONCLUSIONS

The public extension system, especially the ATMA model at the district level, will continue to play a prominent role in serving the larger group of small and marginal men and women farmers as well as landless laborers. The other actors involved in the extension/transfer of technologies—such as NGOs, farmer organizations and the private sector (both corporate and informal)—would actively complement/supplement the efforts of the public extension agency. Extension mechanisms will have to be “farmer driven,”

location-specific and address farmer demands for diversification. The technologies required to address total farming systems are knowledge intensive. The public extension system needs to focus on knowledge-based technologies in order to develop and improve the skills of the farmers.

The modified ATMA model for agricultural development now includes the results of the lessons learned during the pilot study. This model is currently being implemented in 603 districts compared to 28 districts during the first phase (1998-2004). Certain structural and functional changes—such as the sanctioning of state extension work plans at the state level, work force support from the state level to village level, expansion of the scope of options for activities, enhancement of fund allocation and the convergence and integration of all development schemes/programs within the domain of ATMA—have taken place that affect how ATMA now conducts its affairs. The State Extension Work Plan (SEWP) document has emerged as the blueprint for state agricultural development, encompassing all the issues relating to producing, researching, processing, adding value and marketing through the SREP and the CDAP. A significant change in the current ATMA model is the allocation of specific budget lines for mainstreaming gender and public-private-partnership (PPP) concerns. This policy change will certainly facilitate capital inflow and the sharing of resources to generate wealth in the agricultural sector. Also, a large number of extension professionals are now being trained with more useful skills and knowledge, as well as an attitude to carry out these important extension reforms.

With these current changes in place, the district-level ATMA is expected to become the single, most vibrant institution providing a useful connection between farmers, extension, research, and other service providers and stakeholders. The shift from top-down, central planning to a more bottom-up, farmer-led and market driven strategy is being accomplished. It is critically important that the shift to a more market-driven extension system fully supports farmers' efforts to increase their farm income and rural employment. There is usefulness and energy in the ATMA model, as channels are forged and connections made to remake producers, the private sector, researchers, and extension workers, who are now serving their clients in ways that were not possible before the introduction of the ATMA model.

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