

REDEFINING THE EXTENSION ROLE OF STATE AGRICULTURAL UNIVERSITIES TO MEET THE EMERGING CHALLENGES

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Indian agricultural research and extension systems serve more than 90 million farmers, majority of whom are small and marginal. Several approaches were attempted since independence to streamline the public extension system with a view to make it more efficient in meeting farmers needs. These efforts, however, could help the farmers of only a few selected regions by improving their productivity and income, but large chunk of small and marginal farmers with poor access to natural resource base were, unfortunately, left out. One of the important landmarks in these efforts was the establishment of the State Agricultural Universities (SAUs) with the three-pronged mandate of agricultural education, research and front line extension. Although primarily mandated to impart secondary and tertiary level education in agriculture and allied sciences, the SAUs have equally important responsibilities on the agricultural research and extension fronts. A quick retrospective analysis of green revolution vis-a-vis role of extension indicates that, indeed the SAUs could contributed equally by way of their extension efforts to the green revolution. The recent changes in global agricultural scenario have necessitated competitive agricultural environment where cost-effective, productive and sustainable technologies play a crucial role. In this context, the SAUs have to play a pivotal role. In fact, the SAUs are well equipped to provide the much needed on-farm research back up to develop, assess, refine and transfer appropriate agricultural technologies that can trigger the next phase of green revolution.

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Forces of change - The evolution of extension

Looking back into the history of Indian agriculture, the organized extension effort started with Etawah Pilot Project (1948). At the inception of free India, the administrators delivered programmes of human and community development to transform the 'inner man' of rural India. During this period (1948-1960), extensive programmes like Grow More Food Campaign (1948) and Community Development Program (1952) were implemented. However, they failed as concepts due to inadequate clarity of purpose and dedication among multipurpose - village level workers (VLW). A significant achievement of this period was the creation of National Extension Service (1953), for delivering extension program. This was followed by intensive agricultural development projects with focus on transferring augment crop productivity. During this period (1960-1974), Intensive Agricultural Area Program (1966) and High Yielding Varieties Program (1966) were implemented. Here, the role of extension was to motivate and educate farmers to adopt improved technologies. During this period, State Agricultural Universities (SAUs) were started in all the states to generate new knowledge and technologies for the state. Many supporting services like Farmer Training Centres (FTC) and Farm and Home Broadcasting Services were also launched. To complement the state extension services, the Indian Council of Agricultural Research (ICAR) had launched research-based extension programs like National Demonstration Program (1965), Operational Research Project (1971), Lab to Land Program (1979), Krishi Vigyan Kendras (1974) and recently Institute Village Linkage Program (1998). With the introduction of Training and Visit System, the focus shifted to refining and restructuring extension efforts and systems. Professional extension agencies like State Departments of Agriculture (SDAs) were created for rapid dissemination of broad-based crop management practices for high yielding varieties of cereals through trained extension workers.

Extension efforts of SAUs

SAUs were set up in India on the pattern of Land Grant Universities of America with an integrated activity sphere of teaching, research and exten-

sion. They work on the philosophy of serving the rural community through programs to solve their socio-economic problems. Their extension role is complementary to the SDAs. Randhawa (1978) specified extension roles of SAUs as described below :

i) Teaching in Extension Education

To train and produce professionals for teaching, research and extension to provide dynamic and analytical leadership to extension programs through a sound, systematic and integrated undergraduate and postgraduate teaching.

ii) Research

To undertake researches on various facets of extension for –

- Enriching program formulation and operation.
- Gaining insight into the process of dynamics of planned change.
- Developing new methodology and approach for speedy transfer of new technologies to farmers.
- To undertake adaptive and applied research projects with a view to testing applicability of findings under different soil, agro-climatic and socio-economic conditions in different parts of the state.

iii) Application

- To plan, organize and conduct production and problem oriented training to extension personnel.
- To collect, process and disseminate latest research findings to extension personnel and clientele through appropriate extension methods and media.
- To produce information materials and teaching aids to extension personnel, trainers and farmers.
- To carry out frontline demonstrations based on latest findings and to identify field problems as feed back to search agencies.
- To provide effective farm advisory service to the farmers.

The responsibility of planning and coordinating all the above activities lies with Directorate of Extension (DOE) at the university. The DOEs, generally, have three wings – Training, Advisory and Communication. Departments of Extension Education in the Agricultural Colleges perform academic activities of training students. A nucleus staff for extension is also available at each research station. Some agricultural universities have subject matter specialists stationed at the district level for farm advisory and extension services like Krishi Gyan Kendras (KGKs) in Haryana and Plant Clinics in Punjab. Some Universities have Extension Education Institutes that provide training to trainers, conduct problem oriented research etc. Besides these activities, each SAU conducts farmers' fairs; scientist-farmer interactions, exhibitions and video shows to popularize improved technologies.

The constraints

Despite their in-built strengths, the SAUs have often failed to deliver an efficient and effective extension in transfer of technology. The bottlenecks are functional in nature, which are described below :

i) Lack of role clarity

State Agricultural Universities and Line Departments are entrusted with transfer of technology in the state. However, their roles and functions are not clearly defined. Thus the extension efforts are often duplicated by multiple agencies in the state result in Coordination and Management (NATP, 1995).

ii) Low priority for extension

Among the functions of SAUs, extension received low priority for finance and man power. In 1991-92, SAUs spend only 5 per cent of their expenditure on extension education (The corresponding figures were 17 per cent for administration, 33 per cent for academic and 45 per cent for research). In the same year, they employed only 4.7 per cent of their manpower on extension units. The rest of manpower was developed on research (37.6 per cent), academics (40.4 per cent) and administration

(17.3 per cent) (Rao & Muralidhar, 1994). Moreover, a study on performance of extension organizations (Sulaiman & Sadamate, 2000) reveals that DOEs of universities played an insignificant role in extension compared to other agencies (Table -1).

Table-1: Performance indicators of Extension Organization (Average)

S.No.	Organization	Extension Expenditure (Rs/ha)			Contact Intensity (Hr/Target Population)	Technical Manpower : Cultivator Ratio
		Total	Total Salary	Extension		
1.	Department of Agriculture	44.94	4.57	–	0.40	1:1332
2.	Directorate of Extension of SAUs	0.74	–	–	0.01	1:63500
3.	Krishi Vigyan Kendra	5.58	4.21	–	0.09	1:54255
4.	Farmers Association	–	–	46.97	3.01	1:1080
5.	Producers	–	–	34.10	1.96	1:928
6.	Research Institutes	–	–	0.24	–	–
7.	Input Company Seeds	–	–	0.53	0.002	1:578234
8.	Input Company Fertilizer	–	–	0.47	0.1014	1:541723
9.	NGOs	18.59	–	–	0.49	1:13871
10.	Consultancy Services	–	–	–	0.013	1:96555
11.	Commodity Boards	824.2	–	–	0.57	1:2876
12.	Marketing Boards	0.19	–	–	0.002	1:492800
13.	Media - AIR	0.15	–	–	–	–
14.	Media - Print	1.73	–	–	–	–

Source : Sulaiman & Sadamate, 2000

iii) Lack of farmer focus

In India, the ICAR is responsible for doing basic and strategic research while SAUs carry out adaptive and applied research. In reality, the SAU research programs are more basic in nature and do not reflect farmers needs. Moreover, the researchers did not show interest in problem solving adaptive research (MANAGE, 1993 and Farrington *et. al.* 1998). In addition, there was no attempt to review the relevance of on-going research programs in the context of changing needs of farmers.

iv) Weak research-extension-farmer linkages

Strong functional linkages between research system, extension system and farmers are essential components of any technology development and transfer mechanism. In fact, the extension wings of SAUs are expected to serve as linkage machinery between the line departments (SDA) and farmers to ensure development of need-based and location specific research interventions and their rapid dissemination among farmers. However, the SAUs – line department linkages are weak and volatile. Jain (1985) enumerates the following reasons for poor linkages :

- Scientists at the SAUs and Officials at the State Departments of Agriculture (SDAs) are reluctant to accept changes in concepts and procedures.
- Although the programs of SAUs and SDAs bring Scientists and Officials together, they have no real involvement with or appreciation for each other.
- Although the physical infrastructure may be built up at the regional level, decentralization of research administration becomes slow due to insufficient institutional freedom.
- Under Training and Visit System, most often senior extension staff interact with researchers on farmers feedback. However, it does not reflect farmers needs as senior level extension staff have less direct contact with the farmers (Jha and Kandaswamy, 1994). Many times, the line department staff did not attend Zonal Research and Extension Advisory Committee meetings. It shows the poor commitment on the part of line department staff to interest with scientists. On the other hand, the researchers did not make any specific attempts to collaborate with extension officials of line departments and other extension agencies (Farrington *et. al.* 1998).

v) Poor communication capacity

As rightly observed by Arnon (1989) and NATP (1995), there exists poor communication of information between the following:

- Research Agencies – Extension Agencies – Farmers
- Head Quarters – Zonal Research Station (ZRS)
- Head Quarters – Field Staff
- Extension Agency – Farmers

The possible reasons identified for poor status of communication, according to Arnon (1989) and NATP (1995) are :

- Lack of facilities in ZRS / Field Extension Office
- Inappropriate communication methods
- Insufficient funds for purchasing up-to-date communication technologies
- Poor communication skills of staff

Moreover, the research/progress reports are prepared in poor quality. They are often 'routine, ritual, unstable, unused and unread' (Chambers & Belshaw, 1973).

vi) Inadequate training capacity

In the progressional extension system, the SAUs are entrusted to provide technical and managerial training to extension staff. Moreover, DoEs, ZRSs and KVKs are responsible for training subject matter specialists (SMS) of SDAs and farmers. Most often training sessions are handled by junior and inexperienced University Scientists which in turn affect the quality of learning (Farrington *et. al.* 1998). Besides this, DoEs of SAUs have inadequate logistics to conduct training programs.

vii) Inadequate field extension

Besides transfer of technology programs of ICAR, each SAU undertakes field extension programs in the areas under its jurisdiction through subject matter specialists of DoEs / ZRSs. Only some SAUs have well planned field extension program, while others did not pay adequate attention into it (ICAR, 1993).

Changing roles - the NATP effect

With a view to increase the quality and models of technologies available to the extension system, and to overcome the limitations posed over the years by the previous forms of technology dissemination, the Indian Council of Agricultural Research (ICAR) launched National Agricultural Technology Project (NATP) in 1999. Under this project, Innovations in Technology Dissemination (ITD) component has been planned, which aims at developing a transfer of technology (TOT) system that is demand driven, well integrated with research and financially sustainable and accountable to stakeholders of agricultural development (Figure-2). The following are the important features of the project.

1. Increase the quality and type of technologies disseminated through
 - Location specific technology development
 - Diversification and intensification of farming systems
 - Use of sustainability enhancing technologies
2. Enable research and extension systems to become demand driven and responsible for solving problems of farmers.
3. Strengthen research-extension-farmer (R-E-F) linkages.
4. Increase financial sustainability of the system.
5. Shared ownership of Agricultural Technology System (ATS) by key stakeholders i.e. farmers especially poor, women and disadvantaged, public sector research and extension agencies (ICAR, SAUs, DOA etc.).

To operationalize the above concept, it proposes following interventions.

i) Agricultural Technology Management Agency (ATMA)

It is a district level agency functioning under Department of Agricultural and Cooperation of Ministry of Agriculture, Government of India. The responsibility of ATMA is to bring together researchers, extensionists, farmers and other stakeholders (including NGOs and Corporate and Private Sector), to make, on the basis of joint diagnostic studies, district extension plans

and recommendations for expanded adaptive research to introduce innovations in technology dissemination matched to local needs and situations. The organizations structure of ATMA is given in Figure-2.

The comparison of the key features of the present agricultural system and proposed innovations in technology disseminations under NATP are given in Table 2.

Table-2: Present Agricultural Extension System and NATP - Comparative Analysis

Features	Present Agricultural Extension System	NATP (ITD)
Goal	Building a professional extension service to assist the farmers to raise their production	Improve the management by making it farmer driven
Target	Small and marginal farmers	Small and marginal farmers with emphasis on resource poor
Approach	Top down Centralized	Bottom up Decentralized
Focus	Men farmers Marginalization of women farmers	Gender Mainstreaming women farmers into agriculture
Agencies involved	Department of Agriculture Single line of technical and administrative command	Integration of extension activities of all line departments including (KVKs, ZRS, FTCs) Involvement of private firms, credit institutions and NGOs.
Linkages	Envisaged two-way communication between farmers, extension workers and researchers	Strengthening linkage between farmers, extension workers and researchers. Establishment of FIAC for farmers' feedback
Staffing and Financial Sustainability	At field level, VEW supported by AEO and SMS. High cost due to recruitment of large number of field extension staff. Poor financial sustainability	Increase the financial sustainability by strengthening the professional competencies of the existing extension staff. Replacing VEW cadre with farm advisors.
Communication	Poor use of communication technologies	Use of information technologies
Attitude of Functionaries	Professionals	Facilitators

Source: Ravikumar *et. al.* 2000

ii) Agricultural Technology Information Centre (ATIC)

It is established in a research institute. ATIC is a “single window’ support system linking various units of a research institution with intermediary users and end users (farmers) in decision making and problem solving exercise. At the institute level, it has following functions :

- (a) To provide diagnostic services for soils and water testing, plant and livestock health.
- (b) Supply research products such as planting materials and seeds etc. emerging from the institution for testing and adaptation by various clientele.
- (c) Provide opportunity for Institute/SAUs to generate income through sale of technologies.

These activities provide for

- Technology dissemination at the Institute level
- Reducing technology dissemination losses
- Provide feedback mechanism from users to the Institute.

iii) Remandating selected Zonal Research Stations to take up the functions of Krishi Vigyan Kendras

The NATP envisages to strengthen the regional research capabilities of SAUs for undertaking research to develop location specific technologies that are ecologically, economically and culturally sustainable. The district which don’t have KVKs, will be strengthened to take up the additional functions of KVKs:

- Organizing vocational training for farmers groups
- On-farm testing in farming system perspective
- Front-line demonstrations
- In-service training of field officials

To sum up, the remandating will create an ideal situation for technology assessment, refinement and dissemination.

iv) Strengthening Zonal Coordination Units (ZCUs) and Directorate of Extension (DoEs) of SAUs

The NATP calls for a need based strengthening of ZCUs & DoEs to enhance their ability and effectiveness to monitor NATP supported programs in the field. In this regard, they are given training and essential equipment for smooth functioning.

Strategies redefined

From the above discussion, it is evident that SAUs have to redefine and restructure their extension roles and functions in order to facilitate changing conditions. So, the following strategies are suggested to help the SAUs to redefine their extension role and re-orient the programs to the new and changing perspective.

i) Acceptance of multi-ownership of agricultural technology system through :

- Multi-agency approach to technology development and transfer.
- Participatory research.
- Integration of key stake holders' interests.

ii) Technology assessment, refinement and dissemination through

- Research problem identification through PRA
- Farmer participatory research
- Technology refinement by innovative farmers
- Technology development and targeting for small and marginal farmers.
- Technological interventions in the form of intensification and diversification of farming system.

iii) Capacity building of Zonal Research Stations (ZRSs) to

- Conduct adaptive, problem oriented and location – specific research
- Train extension personnel and farmers
- Conduct front line demonstrations

iv) Develop good communication infrastructure to

- Promote easy information exchange between stake holders
- Increase the use of modern technologies and methods to reduce the space and time barriers in communication.

Conclusion

Considering the past experience with different extension approaches and the present global perspective of agricultural sector, the basic requirement for success of agricultural extension system is to improve its organization and management. In this context, the SAUs must redefine their extension roles to meet changing needs of farmers through system based sustainable technology development and dissemination. It calls for restructuring of roles and relationships with key stake holders and re-orienting research and extension programs in the light of the suggested strategies.

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