

CHAPTER 6

ROLE OF AGRICULTURAL EXTENSION PERSONNEL IN PERCOLATION OF NEW TECHNOLOGY

6.1 Introduction

People are the most valuable resource of any country. Many countries like Japan, South Korea, Singapore, Hong Kong have limited natural resources but developed their economy through planned approach for human resources. Efforts for human resource development for achieving higher and better results were initiated during sixties in India. Long back, former Governor of RBI Sri L. K. Jha while addressing a convocation in Ahmedabad observed that 'Prosperity was a manmade phenomenon', i.e., the prosperity of an organisation or even the country is solely related with its manpower. Efficient manpower is not only essential for innovation of a new idea but also important for its diffusion. Agricultural scientists produce new innovations and their diffusion among the farmers largely depends on agricultural extension personnel. Widespread diffusion of agricultural innovation in a developing country like India ultimately hangs on the effectiveness of the channels of communication between agricultural research and the farming community. Agricultural extension service constitutes the main stay of this communication network. Theodore W. Schultz writes, "The suppliers of modern agricultural factors are, among others, the research people who work in agricultural research stations. Farmers in their role as demander of the new factors accept them when they are truly profitable. But typically farmers in traditional agriculture do not reach for them. In the end much depends on farmers learning to use modern agricultural factors effectively." (Schultz, 1964) In this process of learning the people in the agricultural extension service have a great role to play.

In the process of transfer of technology in agriculture the role of extension service is very crucial. Application of new technology for increased productivity depends on adequate flow of information to the farmers regarding new techniques of

production, new inputs and their availability, marketing facility, price and credit support, preservation and processing and above all knowledge about how to obtain this information (Ghosh, 2003). It remains the function of the agricultural agency to serve the farmers with educational, informational and advisory services so as to motivate and build confidence in them by introducing new practices of farming. This is the function of agricultural extension. Bradfield (1966) summarized the philosophy of the extension approach in the following way:

All people desire higher level of livings. Once people are convinced of the value of new methods of solving their immediate problems, they will change their present practices to work toward the standard of living they desire. Therefore the major task of extension is to convince the people of the value of new and better practice. Extension communication is thought as the vehicle for : (i) transferring innovations from the donor or development agencies to their clients, and (ii) preparing individual recipients for change by establishing a climate for modernisation.

An effective communication is central to the success of any extension programme. The task of communication in invoking the desired changes is to ensure a regular flow of information about innovations, to focus on the needs for changes, the methods and means to bring about change and the raising of aspirations of the people for a better way of life. Basically extension workers are supposed to establish linkage between the research institutions and the farmers in the field. They have to carry the teachings and research findings to the farmers for helping them in the betterment of their standard of living.

Keeping in view the essential of agriculture extension workers for agricultural development, the Government of India launched a number of programmes in a phased manner for improvement of agricultural extension services.

The first phase dates from year 1948-1960 as Extensive Extension Programmes which included (i) Grow more food campaign (1948), (ii) Community Development Programme (1952).

The second phase-Intensive Extension Programme (IEP) (1960-1974) included (i) Intensive Agricultural District Programme (IADP), 1960 and (ii) High Yielding Variety Programme (HYVP), 1966.

The third phase started with programmes for research based extension methodology viz. (i) National Demonstration Programme (1966), (ii) Operational Research Project (ORP), 1971, and (iii) Lab to Land Programme (LLP), 1979.

Fourth phase started with introduction of World Bank aided Training and Visit (T & V), 1974 approach for extension through following three projects:

- (i) State Agricultural Extension Project (SAEP), 1974-75;
- (ii) National Agricultural Research Project (NARP), 1980-88;
- (iii) National Agricultural Extension Project (NAEP), 1985-88 and the latest National Agricultural Technology Project initiated in the year 1998.

After going through past trend of agricultural production and status of agricultural extension system in our country, we find the focus of agriculture remained on achieving higher productivity. The Government's interventions also remained focused to achieve this major goal and provide technological support to farmers through extension service and providing inputs. More and more activities were planned for capacity building for extension personnel to enhance their technical skills and capabilities for transfer of technology to farmers through training and field demonstrations. Agricultural extension as a social innovation and a prominent force has been playing an important role in bringing about agricultural development and socio-economic progress. Over the years, Public Extension System has been playing a crucial role in disseminating technologies and to achieve higher production.

Although Public Extension Service has contributed for achieving self-sufficiency in food grain production, in recent past, it is generally disappointing in transferring improved agricultural technologies from research to farmers in India. Indian agriculture has recorded an alarming knowledge-practice gap. India has 30,000 Agricultural scientists generating scientific information (Saravanan and

Shivalinge Gowda, 2002). Today we have nearly 1.2 millions extension personnel recruited by the State Department of Agriculture under T & V system to serve 103 million farm families. There are 127 agro-climatic zones in the country with a variety of crops and animal production system wherein there is lot of scopes for adoption of improved technologies. But it is estimated that only 30 percent of the available technologies are adopted by the farmers (Hansra and Adhiguru (1998). Some common causes for the gap are ineffective extension education, inadequate input supplies, inadequate credit support and inadequate marketing infrastructure (Saranan and Gowda, 2002). According to Hansra and Adhiguru (1998) the current public extension system transferring technologies are not economically viable, not operationally feasible, not suitable, not matching with the farmers need and not compatible with farmers overall farming system. Over and above extension personnels are not evenly distributed among the villages. Some villages are still experiencing shortage or even non-existence of extension workers to disseminate new agricultural technology messages. As was observed during our field survey, majority of the sample farmers of both non-tribal and tribal category had to depend on input suppliers and progressive farmers rather than on extension personnel for information of new agricultural technology. The problem was found to be more serious among the tribal farmers.

During field survey, an attempt was made to ascertain the role of extension personnel as well as other sources of information for both tribal and non-tribal farmers. To make an assessment of the role of extension personnel a question was put as to from where did they get the information about new technology. The answers to the question by both non-tribal and tribal farmers are presented in Tables 6.1 and 6.2.

Table 6.1 Role of Extension Personnel in Disseminating New Agricultural Technology Among Non-Tribal Farmers

Sl. No.	Sources of Information	No. of Farmers obtaining information about new technology		
		Large Farmers N=40	Medium Farmers N=40	Small Farmers N=40
1.	Village level extension workers (formal source)	10 (25.00)	3 (7.5)	0 (0.0)
2.	Input suppliers	30 (75.00)	20(50.00)	10
3.	Progressive farmers	5 (12.5)	20(50.00)	15
4.	Radio	5 (12.5)	5(12.5)	0
5.	Television	0 (0.0)	0 (0.0)	0
6.	Newspaper	2 (5.00)	2(5.00)	0
7.	N.G.O.'s	0 (0.0)	0 (0.0)	0
8.	Any other source	0 (0.0)	1(2.5)	0

Source: Field Survey, 2004

Note: Figures within parentheses are percentages.

It appears from the table that out of 120 non-tribal respondents only 13, i.e., 10.83 percent have obtained information about new technology from extension personnel. The majority of the farmers are obtaining information from non-formal sources, i.e., input suppliers and progressive farmers. The table also shows that out of 40 small farmer respondents, not a single respondent has obtained information about new technology from extension personnel. Small farmers are found to have obtained information from non-formal sources, i.e., from input suppliers and progressive farmers. Therefore, it turns out to be a fact that extension personnels do not usually contact resource poor farmers to disseminate knowledge about new methods and practices of cultivation. Similar is the experience in other developing countries also (Nkowani, McGregor and Dent, 1995).

During field survey, the role of extension personnel in disseminating message of new technology among tribal farmers was found to be more negligible and inadequate. Table 6.2 shows the role of extension personnel among tribal farmers.

Table 6.2 Role of Extension Personnel in Disseminating New Agricultural Technology Among Tribal Farmers

Sl. No.	Sources of Information	No. of Farmers obtaining information about new technology		
		Large Farmers N=40	Medium Farmers N=40	Small Farmers N=40
1.	Village level extension workers (formal source)	3 (7.5)	0 (0.0)	0
2.	Input suppliers	12 (30.00)	13(32.500)	7(17.5)
3.	Progressive farmers	14(35.00)	15(37.50)	10(25.00)
4.	Radio	0 (0.0)	0 (0.0)	0
5.	Television	0 (0.0)	0 (0.0)	0
6.	Newspaper	0 (0.0)	0 (0.0)	0
7.	N.G.O.'s	0 (0.0)	0 (0.0)	0
8.	Any other source	0 (0.0)	0 (0.0)	0

Source: Field Survey, 2004

Note: Figures within parentheses are percentages of total number of farmers in each group.

Proper scanning of Table 6.2 makes it clear that out of 120 tribal sample farmers only 3, i.e., 2.5 percent are provided with information of new agricultural technology by formal extension service, i.e., extension personnel while the figure is 13, i.e., 18.83 percent in case of non-tribal sample farmers. It also appears from the

table that only large farmers that is resource abundant farmers are found to have contact with the extension personnel for agriculture-technology related information. It is evident from the table that non-formal extension services, i.e., input suppliers and progressive farmers are playing a major role in disseminating the agricultural technology related information. Out of 74 information recipients as high as 71, i.e., about 95.95 percent are provided with information by non-formal extension services, i.e., input suppliers and progressive farmers. So farmers are dependent on non-formal sources rather than public extension system for getting advice as well as farming inputs (Schultz, 2000). This appeared to us really astonishing and unbelievable. During our field investigation many tribal farmers particularly illiterate and small farmers reported that they had not even heard the name of agricultural extension personnel, not to speak of being met them. Inadequate and ineffective formal extension services are one of the major causes for slow adoption and non-adoption of agricultural technology both by tribal and on-tribal farmers in Barpeta District.

The diffusion of agricultural technology through agricultural extension did not make much impact on the subsistence farmers in the rural India (Tripathi, 2000, Ghosh, 2003). Ascroft and Gleason (1980) observed that adoption rate in the third world countries were remarkably low when compared with the developed countries. The S-shaped curves that usually show the complete adoption of an innovation in developed countries are far from taking shape in these countries. Scholars have identified several factors that inhibit adoption of new technology by farmers in developing countries.

Development scholars have identified some socio-psychological constraints that usually stand on the way of modernization of peasantry. Rogers (1967) described the socio-psychological constraints as the sub-culture of peasantry and delineated the main aspects of culture as:

(i) mutual distrust in inter-personal relations, (ii) perceived limited good, (iii) dependence on and hostility toward Government authority, (iv) familism, (v) lack of

innovativeness, (vi) fatalism, (vii) limited aspiration, (viii) lack of deferred gratification, (ix) limited view of the world, and (x) low empathy.

Studies have also shown that there may be some structural and resource related constraints like lack of an effective system for delivering knowledge and skills or financial and material inputs, inadequate market development, under development of infrastructure, lack of employment opportunities or lack of peoples' involvement in designing, planning and executing development programmes and projects that prevent the subsistence farmers from adopting new technologies and methods of farming. Agricultural extension in our country is primarily concerned with the following main objectives:

- (1) The dissemination of useful and practical information relating to agriculture, including improved seeds, fertilizers, implements, pesticides, improved cultural practices, dairying, poultry, nutrition etc.;
- (2) The practical application of useful knowledge to farm and home, and
- (3) Thereby ultimately to improve all aspects of the life of the rural people within the framework of the national, economic and social policies involving the population as a whole.

To materialize the objectives, the extension work must be based upon some working principle and knowledge of these principles is necessary for an extension worker. Some of these principles as related to agricultural extension are mentioned below:

1. **Principle of Interest and Need:** Extension work must be based on the needs and interest of the people. These needs and interests differ from individual to individual, from village to village, from block to block and from state to state and therefore, there cannot be one programme for all people.
2. **Principle of Cultural Difference:** Extension work should be based on the cultural background of the people with whom the work is done.

Improvement can only begin from the level of the people where they are. This means that the extension worker has to know the level of knowledge and skills of the people, methods and tools used by them, their customs, traditions, beliefs, values etc. before starting the extension programme.

3. **Principle of Participation:** Extension helps people to help themselves. Extension work to be good must be directed toward assisting rural families to work out their own problems rather than giving them readymade solutions. Actual participation and experience of people in these programmes creates self-confidence in them and also they learn more by doing.
4. **Principle of Adaptability:** People differ from each other, one group differs from another group and conditions also differ from place to place. An extension programme should be flexible, so that necessary changes can be made whenever needed to meet varying conditions.
5. **The Grass Root Principle of Organization:** A group of local people in local community should sponsor extension work. The programme should fit in with the local conditions. The aim of organizing the local group is to demonstrate the value of the new practices or programmes so that more and more people would participate.
6. **The Leadership Principle:** Extension work should be based on the full utilization of local leadership. The selection and training of local leaders to enable them to help to carry out extension work is essential to the success of the programme. People have more faith in local leaders and they should be used to put across a new idea so that it is accepted with the least resistance.
7. **The Whole-Family Principle:** The extension work will have a better chance of success if the extension worker have a whole-family approach instead of piecemeal approach or separate and unintegrated approach. Extension work, therefore, should be for the whole family, i.e., for male, female and the youth.

8. **Principle of Satisfaction:** The end-product of the effort of extension is the satisfaction that comes to the farmer, his wife or youngsters as the result of solving a problem, meeting a need, acquiring a new skill or some other changes in behaviour. Satisfaction is the key to success in extension work. "A satisfied customer is the best advertisement."
9. **The Evaluation Principle:** Extension is based upon the methods of science and it needs constant evaluation. The effectiveness of the work should be measured in terms of the changes brought about in the knowledge, skill, attitude and adoption behaviour of the people but not merely in terms of achievement of physical targets.

In recent years, there has been new development world over and shift in agricultural cropping pattern from subsistence to commercial agriculture; our farmers are taking up more and more cash crops. The situation demands new extension approach for benefiting farming community.

6.2 Imperatives for New Strategies and Methodologies for Extension Service

Looking into the development of Indian agriculture and changes taking place to domestic as well as international environment, during the last few years, the strategies and methodologies for agricultural extension will have to be modified. The traditional extension methods are expensive, time consuming, quality of message distorted as it passes through different channels, poor quality of communication by extension personnel. Thus we can say that traditional extension methods are very limited, and cannot reach in all the villages and all the farmers. Review of literature also support the proposition of poor extension service in our country. According to World Bank supported, Government of India, Ministry of Agriculture sponsored study (1990), "with few brilliant exception the village extension workers are neither an educated nor a knowledgeable lot and some of them are even illiterate, they will continue to be so are the most unlikely persons to become the engine of technology transformation. Public extension system being inadequate and ineffective, farmers are more dependent on other than public

extension system for getting technical advice as well as farming inputs. (Sharma, 2000)

The extension is now becoming more diversified, more technology intensive and more demand driven. This requires the extension worker at the cutting edge level to be master of so many trades, which is wellnigh impossible. The use of Information Technology will help the extension workers to be more effective in meeting farmers' information needs. It is going to play a pivotal role in extending agricultural extension service more effectively to farmers. It is now possible to furnish the latest information to farmers by developing an interactive multimedia for finding solution to various problems faced by farmers at different stages of their farming operations.

Access to information and improved communication is a crucial requirement for sustainable agricultural development in 21st century. Modern communication technologies when applied to conditions in rural areas can help improve communication, increase participation, and disseminate information and share knowledge and skills. It is said that we live in the information age. It is also said that technology will change the world and the people who adopt and use technology make the changes. In this age of information, computer based multimedia is a tool for communicators of all trades and an effective catalyst for change. The computer application in extension will be the major force of technology dissemination in future. Some of them are called "Cyber Extension." Cyber Extension means, "using the power of online networks, computer communication and digital interactive multimedia to facilitate dissemination of agricultural technology. The advent of INTERNET on communication scenario offers enormous potential for two-way on-line communication between distant parties via the telecommunication and computer network spread over the entire globe. The world is rapidly shrinking to a global village. The merger of communication (audio and video) and computer technology has made this combination so powerful that no sector of human activity can afford to ignore it.

Improved communication and information access is directly related to social and economic development. There is a concern that the gap between the information rich and information poor is getting wider. New information and communication technologies are generating possibilities to solve the problems of rural poverty, inequality and giving an opportunity to bridge the gap between information rich and information poor and support sustainable development in rural and agricultural communities. Therefore, computer aided knowledge dissemination mechanism help to reach the un-reached and foster new voices and new leaders. Any kind of effort in this direction will be highly effective way to empower the rural population with the most needed commodity, i.e., information. Computer based information thus can be used as a complement in conjunction with existing extension and rural development. It will widen the scope of extension and improve quality.

In India, more than 70% of the farm work is done by the women (Sulaiman and Sadamate, 2000). In the study area also both tribal (Bodo) and non-tribal women were found to perform more than 60 percent of the farm work. But it appears from existing literature that share of women extension personnel in extension service is very insignificant. As per report of Ministry of Agriculture (1995) only 0.59 percent of all extension officers are women (including Kerala where 25% of extension officers are women). In our study area also not a single extension worker was found to be a woman extension personnel. Men extension workers mainly concentrate on male farmers and it is not easier to communicate by male extension agent to women cultivators in rural area due to socio-cultural difficulties. Public Extension Policy and extension personnel never consider women cultivators as independent entities, they always treat women cultivators in rural areas as part of household or appendage to men (Saravanan and Gowda, 2003). Agricultural technologies are often designed and disseminated without considering women cultivators. Public extension system targeting women should take concerted efforts to promote women access to ownership of land; access to credit; to build technical competency on skill based technologies; to increase participation in decision-making; to organize them into self help groups and; to develop their leadership abilities. The TANWA model, which is

quite a success in Tamil Nadu can be expanded further to cover all the villages in Assam. The success achieved in agricultural development till date can be attributed largely to the efforts of the public sector extension. However, in the present era, with the growing importance to cutting edge technologies it becomes difficult for the public sector extension to deliver the goods. Besides, the financial crunch is also adding to the pressure on the government to maintain the extension network. As effective alternative would be to delink certain services from the public sector and allow the private sector to handle those services. The draft policy framework for agricultural extension (2000-2001) states that wherever possible subsidies will be phased out in order to stimulate emergence of a private input supply network to provide hybrid seeds, artificial insemination services, fertilizers, bio-fertilizers, agro-chemicals, animal feed, machinery and equipment and other agricultural supplies and consultancy services to farmers on a full cost recovery basis.

A study conducted in Bihar, Kerala, Maharashtra and Rajasthan showed that the participation of private sector in agricultural extension activities is limited to only few crops (especially horticulture crops) and selected geographical regions (having high potential) (Sulaiman and Sadamate, 2000). An investigation in Tamil Nadu State indicated that the private agricultural consultancies have emerged after mid 1990s. Most of these consultancies are non-registered, mostly run by a single technical person, covering small area, mainly concentrating on all aspects of horticultural crops. Further, the study indicated that 95 percent of farmers had favourable attitude towards privatization (Saravanan, 1999). Similar results have been reported in Haveri district of Karnataka where 76.59 percent of farmers had favourable attitude towards privatisation of extension services (Hanchinal et al, 2000). In our study area of Barpeta district of Assam where Public extension services are found extremely inadequate and ineffective there is every possibility that farmers will support private extension services. Under the T & V system the technology dissemination regime was more supply driven. Research and extension agendas were pre-set based on assumptions about issues in the rural areas. An important reason why research and extension were insensitive to farmers' problems

was due to the lack of effective feedback system. The vast majority of small and marginal farmers especially women, are not in a position to influence research and extension priorities. Therefore, what is required is a demand driven extension system that is driven by farmers' needs. For the purpose of improving the feedback systems, farmers need to be organized into functional groups Like self help groups (SHGs). These groups can provide an effective channel for both the dissemination of technologies and they can provide an effective feedback to research and extension.

Public sector extension has undergone several changes since independence. The most significant recent development was the introduction of the Training and Visit (T & V) system starting in the mid 1969-70s. The T & V system profoundly influenced practices and registered impressive gains in irrigated areas but failed to create an impact in rainfed areas. The T & V system was a top-down approach which generated uninformed rather than specific and has lacked focus on location specific needs of regions, disadvantaged areas, target groups, enterprises etc. Linkage between research extension and farmers remained weak. Its achievements have remained far less than adequate. This system has not proved to be successful in making adequate use of the available technology.

By the early 1990s, it was recognized that extension department should broaden its programmes by utilizing a farming systems approach. Attention should be given to diversifying extension programmes into livestock, horticulture and other value based commodities that would increase farm incomes. Present day agriculture is defined by key concepts of stability, sustainability, diversification and commercialization. There is need for reorientation of the philosophy of extension from technology transfer mode to technology application.

T & V system of extension, though failed in materialising desired objectives in technology dissemination in Indian farming system, it has been found successful in many countries of the world. A good example is provided by Indonesia, which has been introducing the Training and Visit (T & V) system, and has been able to build on a number of traditional groups. Rural people in Indonesia have lived and worked for centuries with strong communal groups or co-operatives such as subak

(farmers' associations formed for use of irrigation water), gotong royong (farmers' self-help association) and mapulus (farmers' mutual assistance association). These have a membership, and high loyalty to the leader, and for introducing T & V extension; these farmer groups have become the focus for guidance and technology transfer (Hanchinal, Sundaraswamy and Ansari, 2000)

Historically, they had been rather hierarchical with a tendency to operate in a top-down fashion, and so when the T & V system was introduced the traditional leader often became the contact farmer. Now, however, they have moved to identifying subgroups in adjacent field areas, and matching up farmers with different resources levels to have more representative contact farmers. They discuss and agree their seasonal extension programme, decide on technology appropriate to their situation, and monitor feedback from questions posed at the regular visit of the extension worker. In this way they have become much participatory. The village receives special training in maintaining group dynamics and the local administration gives active encouragement.

Another example is from a pilot project in the Midlands of Zimbabwe that has been running for the last few years. Here again there is a strong tradition of work associations for sharing agricultural labour, and more recently of savings groups that have been especially strong among women. Here farmer groups organized for extension purposes are normally sub-divided when numbers exceed thirty, to keep practical demonstrations effect and retain the groups' cohesiveness. A key feature is that the final stage of dissemination of improved technology is done by farmer representatives themselves, two of whom are selected to attend each training session fortnightly and to report back to the rest of the group. This is a tenet of the T & V system but rarely it is institutionalized and done so effectively. The chosen contact farmers rotate amongst group members depending on their individual attributes related to the topic under discussion. This enables several members of the group to be both trainee and trainer, and by going together it reinforces their mutual knowledge of the lesson being discussed. The fortnightly training sessions, which other farmers may attend as well as group leaders, are conducted on members' plots,

and group leaders rotate their training of fellow group members around different member farms. Slogans in the vernacular and songs about the lessons have all helped to motivate keep participation by all members, especially the women. Whereas less than 10 percent of farmers were in groups before the pilot scheme started few years ago, groups covered about 70 percent by mid 1985 (Hanchinal, Sundaraswamy and Ansari, 2000).

If we apply the experiences of Indonesia and Zimbabwe in Indian T & V system we can expect at least some improvement in the existing extension services.

Agricultural extension through T & V system is pertinently one-way top-down communication. Under this system, decisions regarding adoption of new agricultural practices deemed desirable for farmers are taken by the officers who are at the top of the administrative hierarchy and then those recommendations are disseminated among the farmers by extension workers. The down-up approach in communication is thus absent in the system which very often leads to ill-adoption of innovation that does not fit local requirements. Agricultural extension to be effective and fruitful must be based on co-equal sharing of knowledge where both the extension officers and the farmers have equal chance of influencing each other not only in solving problems during the adoption of a technology but also in deciding the suitability of adopting the technology. Gentel (1989) pointed out that the extension system should be managed by the state and farmer groups in cooperation with each other.

In recent years role of Non-Governmental Organizations (NGO) in dissemination process of new agricultural technology has assumed special significance. In this regard a pilot control government scheme, agricultural extension through voluntary organizations was launched in 1994-95 to increase the involvement of NGOs in an effort to strengthen the research extension delivery system. The scheme initially involved 14 NGOs in eight states. Experience has been encouraging both in terms of physical targets and in targeting NGO efforts with those of the main extension system (Govt. of India 1996). The number of NGOs under this programme is being increased to 50 in the Ninth Plan covering more

number of states. The states are also encouraging the NGOs to take up the extension activities where an encouraging response has been on the cards.

From our field investigation it appeared to us that the NGOs can be made to contribute significantly to the development of their respective areas/people in many ways such as:

- (i) awareness generation, extension and motivation;
- (ii) experimentation, innovation and developing micro models;
- (iii) organizing farmers, women and others for participating in development activities;
- (iv) organization and social audit, making government to work; and
- (v) influencing policy making and programme designing (Hirway, 1997).

The technical manpower to cultivator/people ratio of NGOs is generally very low but then these normally operate with only few selected groups of clients. Their funds come from foreign donors or government departments. Several ministers of Government of India have separate provision to fund specific projects and NGOs are availing these opportunities. Mostly the NGOs operate independently in their own areas. NGOs can play effective role in their areas in promoting the adoption of the new agricultural technology through better self-involved education of the farmers and other groups.

Farmers are not only producer of commodities but they also play a role of agri-preneur in coming years for which they will certainly require support from existing extension system. Our field survey experience suggests that to make agriculture a remunerative activity, need for a strong marketing extension has been felt in recent years. With changing scenario extension personnel will require skills in certain areas related with agri-business such as cost/benefit analysis of production and its marketing, handling agriculture marketing intelligence, demand supply analysis of commodities and value addition to agriculture produce etc.

The type and extent of organizational, management and communication skills to be given to extension can be decided according to the framework of organization and management of agricultural extension system likely to emerge in the 21st century. In order to develop a demand responsive extension system for Indian agriculture “National Agricultural Technology Project” is initiated in six stages on experimental basis, suggesting a lot many changes in present systems and organization of research and extension services to farmers. This will also add many new capabilities required for extension personnel, in the agenda for Human Resource Development. To emerge as leaders in agriculture sector, human resource development of extension personnel and farmers will be the most potential area for attention in the new millennium.