

## MODELS OF EXTENSION AND COMMUNICATION WITH FARMERS EVALUATION FOR REPLICABILITY\*

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### EXTENSION

Extension Education has become the largest problem solving educational system of the world. In fact, it has become a powerful instrument of change for bringing about socio-economic transformation of rural people based on the latest scientific and technological innovations and know-how.

The term 'Extension Education' was first coined and used in the year 1873 by Cambridge University in England. It was a particular type of educational innovation and its purpose was to take the educational advantage of the University to the people at large where they lived and worked. It was more precisely a university extension movement and gradually spread to other institutions in the U.K. The concept spread and was applied in many other countries within a decade or so, mostly in the form of extension lectures on agricultural subjects.

The American Extension Movement also started from the Universities and large public libraries and the first Director of Extension was appointed at Chicago in 1892 who incidentally was an Englishman named Moulton from Cambridge University (England). He also documented the world's first treaties in Extension in 1885. The movement receded and remained dormant for sometime but revived again early in the next century and its major impact was mostly in agriculture and rural home development programmes in the U.S.A.

The term extension education has been defined in several ways by extension educationists and the author has come across at least eighteen such definitions in the available extension literature. It is not possible nor necessary to quote all the definitions here, but a few of the most commonly

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used are stated below to understand its meaning and concept.

1. Extension education is a behavioral science following a continuous, persuasive and discriminating educational process. It aims at affecting the behavioural components of people in a desired direction through conviction, communication and diffusion by its proven methods. Principles and philosophy resulting in learning involvement of both client and change agent system
2. Agricultural extension is "A service of system which assists farm people through educational procedures, in improving farming methods and techniques, increasing production efficiency and income, bettering their level of living and lifting the social and educational standards of rural people".
3. Extension education is defined as an educational process to provide knowledge to the rural people about improved practices in a convincing manner and to help them take decisions within their specific local conditions.
4. Extension is a continuous process designed to make the rural people aware of their problems and indicating to them the ways and means by which they can solve them. It involves not only the education of rural people in determining their problems and methods of solving them, but also inspiring them towards positive actions in achieving them.
5. Extension education is an applied science, consisting of contents derived from research, accumulated field experience and relevant principles drawn from the behavioural sciences, synthesized with useful technology, in a body of philosophy, principles, content and methods focussed on the problems of out-of-school education for adults and youths.
6. Extension education is an applied behavioural science, the knowledge of which is to be applied for desirable change in the behavioural complex of the people.

The concepts of extension education vary in relative emphasis upon education, service, programme etc. but there is more commonality in them than differences. From these and other definitions and concepts it clearly emerges that Extension Education is:

1. an educational process,
2. aimed at bringing about desirable behavioural changes in the people and helps them making rational decisions
3. These behavioural changes consist of:
  - a) change in attitude, b) change in knowledge and skill,
  - c) change in adoption behaviour using modern scientific and technological innovations, and know-how finally d) resulting in socioeconomic and cultural development and better life for individuals, groups and people at large.

It might also be clarified here that extension education is a discipline in itself and its basic principles, concepts and methodology could be used and are being used for bringing about various types of behavioural changes and successful implementation of developmental programmes. When extension education is applied to agricultural production programmes, it is called "Agricultural Extension, when it is applied to dairy, veterinary, fishery, it is called Dairy Extension, Veterinary Extension and Fishery Extension," respectively. It is being used most widely for promoting family planning, nutrition and child care and development programme and health extension programmes. We even have industrial extension programmes.

Keeping these concepts in view, different countries have organized their extension system in different ways depending upon their own situation, needs, level of development, resources—both financial and trained manpower, government policy, and goals and aspirations of the people. Since the distinguished delegates and experts are present here from different Afro-Asian countries and themselves will present the models of extension operating in their countries, it is not considered necessary here to repeat the same. This paper, therefore, deals with the extension system of India from its inception leading to its present status.

### Extension Education in India

Extension Education in India has passed through several phases. During the pre-British period the aim was to have self-contained, self-reliant and self-governing village societies, and the village panchayat (Council) was the main instrument of achieving the same. During the British period almost until the country became independent, various attempts were made to introduce developmental programmes of different kinds, mostly by individuals and some by recognized institutions. Most of these programmes were of a casual nature and sporadic attempts were made by these individuals, voluntary or government agencies to promote developmental activities.

Among them mention may be made of the efforts made by Rabinanath Tagore at Shriniketan, the Gurgaon Experiment of F.L. Bryan, Spencer Hatch's work at Marathandam, the Rural Reconstruction work of Deniel Hamilton, Rural Reconstruction work by Christian Missions, the Firka development scheme in the, then, Madras State, Mahatma Gandhi's Mahatma Gandhi's Experiment at Sevagram, the Indian Village Service, A.T. Mosher, and the Sarvodaya Programme in Bombay etc. Another project which may be considered as the forerunner of the Community Development Programme and Extension Service in India was the Etawah Pilot Project (1948) initiated by Albert Mayer in 97 villages in Uttar Pradesh where intensive rural reconstruction work covering all major aspects of rural life was initiated and where the multi-purpose concept of Village Level

Worker agents was conceived and experimented with. It was basically on the model of this project and also on the basis of the 'Grow More Food Campaign' Inquiry Committee Report that the first 55 Community Development Projects were initiated in the year 1952 which later on became a community development programme covering the entire country through its 5000 and odd C.D. blocks. The other experiment worth mentioning was the Nilokheri Experiment initiated by S.K. Dey which emphasised agricultural development including poultry, pigs, horticulture etc., small and cottage industries programmes, establishment of polytechnics and engineering workshops, garment manufacturing centres etc.

#### The Community Development Programme and National Extension Service

Based upon the experience of the 55 Community Development Projects initiated in the year 1952, a nation-wide Community Development programme was initiated in the year 1953. Community Development was considered to be a process, a programme with clearly defined objectives to be achieved. Extension Education was declared as the means or method through which the objectives of the Community Development Programme were to be achieved. Thus, officially, the National Extension Service was formed in the year 1953 and gradually covered the entire country by 1963. Through the Community Development programme, India made a commitment to all-round rural development. However, a critical review of the Community Development programme, brought to light a number of factors responsible for its failures. Some of them were:

1. The Community Development Programme focussed more on amenities (welfare activities) than economic development.
2. The programme was expanded too rapidly which robbed the programme of its earlier vigour and vitality.
3. The programme basically became a government programme with very poor participation of the people.
4. The Community Development Programme lacked focus as it took up many activities simultaneously.
5. The approach was mostly bureaucratic rather than educational. The bureaucratic culture has four characteristics:
  - a) Impersonal way of operation and emphasis on safeguarding the formal rules and procedures.
  - b) Only one way communication—mostly downward communication and not upward.
  - c) It did not permit initiative.
  - d) Lack of orientation and commitment to the new programme.
6. One of the most important objectives of the programme, namely solving the food problem, could not be achieved due to a variety of reasons.

But it would be wrong to say that the Community Development pro-

gramme had no accomplishments. It brought out a unified development administration bringing together all the developments under block administration in a coordinated manner. The Community Development Programme brought a unified administrative apparatus which was more readily accessible to the village people. Also the provision of amenities in the village created new hope and aroused more expectations.

During this period a massive effort was made to train the extension workers in the art and science of extension education by establishing extension education institutes, village level workers' extension training centres, block development officers' training centres, extension wings in agricultural colleges, etc. However, since the expansion of this programme was rapid, the standard of extension education and its professional character could not be maintained, the concept of extension education got diluted and the extension workers were confined mostly to service and supply functions.

#### Other Programmes

Since the community development programmes could not achieve the goal of increasing food production, new programmes like the Intensive Agricultural District Programme (1960–61) and Intensive Agricultural Area Programme (1964) were introduced, the technological base of these programmes remained weak though a sound concept of individual farm planning was introduced and extension workers prepared farm plans for each farm holding. The agricultural production started moving upward only after the introduction of the High Yielding Varieties Programme in 1967 when new high yielding varieties of wheat, rice and hybrids of maize, sorghum and pearl millet were made available. It was not only these varieties which were responsible for breakthrough in agricultural production but also several innovative extension methods like National Demonstrations, etc. which were introduced and adopted by scientists for quick transfer of technology. While the High Yielding Varieties Programme did help in overcoming the country's food deficit problem, a new phenomenon emerged and criticisms were made that the benefits of the new agricultural technology mostly had gone to well-to-do farmers, and the small and marginal farmers did not share these benefits equally. And, hence, the gap between big and small farmers widened. Consequently, several new programmes were designed for the rural poor, like the Small and Marginal Farmers and Landless Labour, Agency, finally leading to an Integrated Rural Development Programme (IRDP) were introduced. In fact on October 2, 1980, all the 5004 Community Development Blocks in the country were brought under IRDP.

## The Extension System: The National Extension Service

The Extension System is primarily responsible for the dissemination of farm information and educating and helping the farmers to integrate such information in their own farming systems. In order to discharge these functions, a series of steps have been taken from time to time by the Government of India and the State Governments to organize their Extension Service. The National Extension Service started in the year 1953 and, since then, a network of this service has been organized at different levels, namely, at the National, State, District, Block and Village level. Figure 1 gives the organizational chart and linkages between local government authorities and field agencies at different levels.

This system has both vertical as well as horizontal communication. Vertical communication is from State level to Division, District, Subdivision, Block Village and, finally, to the farmers. The technical departments follow the same hierarchy but at the block level they work through the Block Development Officer who coordinates the programmes and activities of all the development departments. Horizontal communication is between officers of different departments at the same level.

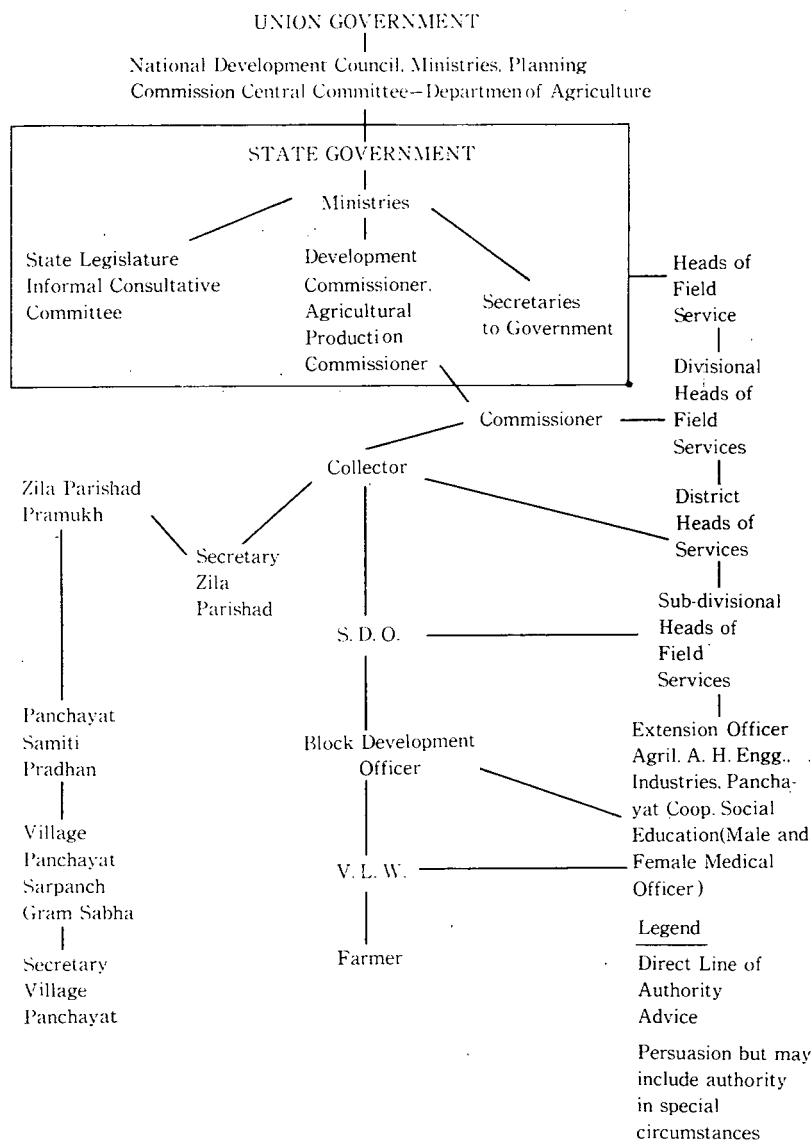
In addition to the general extension set-up, there are a number of specialized extension agencies functioning in the country like the Small and Marginal Farmers Development Agency, Tribal Development Agency, Drought Prone Area Development Agency, etc.

It is clear from the above brief resume that changes have been introduced in the extension approaches extension programmes, and system from time to time. One of the problems in the extension system was that the grass-root extension functionaries, namely the Village Level Workers, have a large area and a large number of farm families to work with. Also the professional level of these functionaries was not up to the desired level in view of the recent breakthrough in agricultural technology and its sophisticated nature. They were multipurpose workers with multitudes of control. In order to remove these deficiencies, the Agricultural Extension System in this country is being reorganized with World Bank assistance and this reorganized system is commonly known as the Training and Visit System.

## The Reorganized Agricultural Extension System (T & V System)

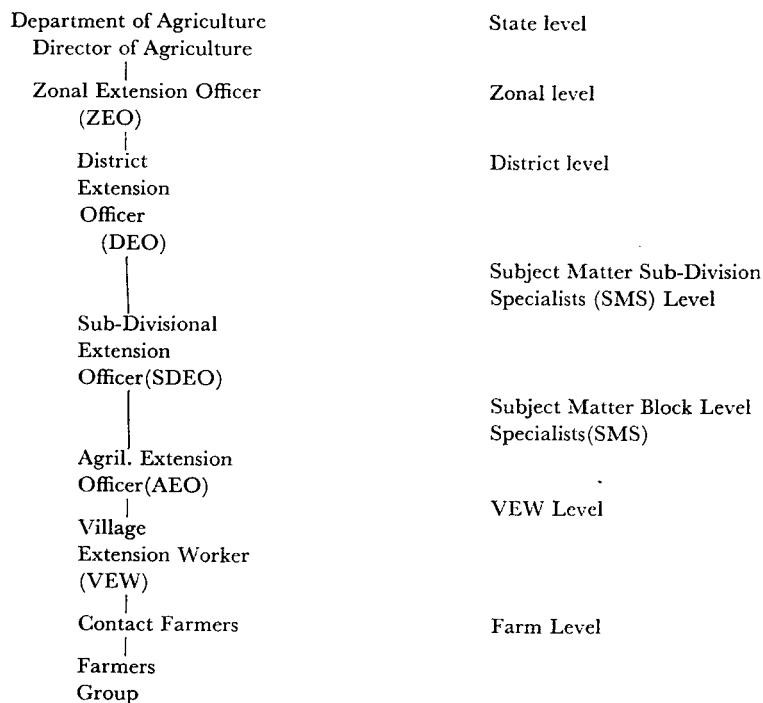
As stated before, one of the problems in the extension system was that the grass-root extension worker, namely village level workers, had excessively large areas and numbers of farm families to contact and work with. Also, their professional level was not up to the desired level, particularly in view of recent breakthroughs in agricultural technology and their sophisticated nature. Further, the V.L.W.s were multipurpose extension wor-

**FIGURE 1 NATIONAL EXTENSION SERVICE AND ITS LINKAGE WITH GOVERNMENT, LOCAL AUTHORITIES AND FIELD AGENCIES**



kers and not only agricultural extension workers. Taking into consideration these and many other aspects, a new system of agricultural extension has been introduced in India recently, commonly known as the Training and Visit (T & V) system. The organizational pattern and linkages of the reorganized agricultural extension system is indicated in Figure 2.

FIGURE 2 ORGANIZATIONAL PATTERN OF REORGANISED EXTENSION



The new methodology is simple in nature and provided for an efficient management system which requires more effective utilization of existing manpower for ensuring agricultural production. The transfer of know-how from the research station to the farmers field is sought to be achieved in two broad stages:

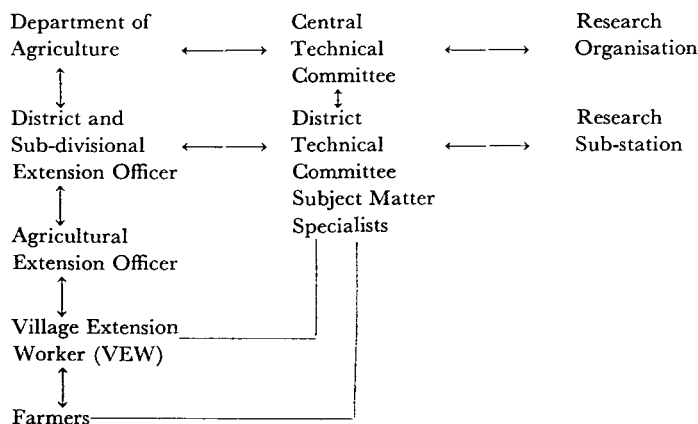
Stage 1—Training: provides for transfer of know-how from research scientists to extension workers through Subject Matter Specialists

Stage 2—Visits: provides for transfer of know-how from extension workers to the farmers

Training of extension workers is organized by Subject Matter Specialists according to a fixed schedule once every fortnight. The village level worker in turn visits the farmers as per pre-planned schedules for four days in a week. The jurisdiction of Village Level Workers (VLW) has also been reduced to 500 farming families in intensive areas and 800 farming families in other areas. One Agricultural Extension Officer (AEO) is provided for supervision of 8 VLWs. A Sub-division headed by a Subdivisional Agricultural Officer and assisted by Subject Matter Specialists covering 3 to 5 blocks having 80–100 VLWs is normally the unit for the implementation of the programme.



FIGURE 3 LINKAGE BETWEEN EXTENSION SERVICE AND RESEARCH



The system has now been introduced in 13 States and other States are also actively considering the same. Though it considerably takes care of the mentioned shortcomings, it also suffers from a number of weaknesses. For example, the contact farmers form a very important link between the extension workers and the rest of the farming community of the area and the success of this new approach depends upon the efficient functioning of these contact farmers. But some of the recent studies have indicated that the selection and use of these contact farmers is not as per the requirement of the scheme and in a number of cases the same well-to-do farmers who have earlier taken advantages of most of the extension programmes are coming up as contact farmers.

One important contribution of the T & V system is establishing a close linkage between research and extension through the Subject Matter Specialist (Figure 3). The Subject Matter Specialists (SMS) as part of their work are required to spend one third of their time visiting the nearest research station every month. On the other hand, the SMS are responsible for the training of Extension Officers and village level workers, informing of the latest development in agricultural research and bring back the farmers' problems to the attention of research workers. The systematic visits of village level workers (VIWs) and other extension functionaries provide regular contact and effective linkage with the farmers. In this process, contact farmers play a key role.

### Some Observations on Extension Achievements

While extension education has played a key role in many ways in agricultural development in general and in increasing agricultural production in particular, the same has not been adequately recognized and the

credit for a breakthrough in agricultural production from about 50 million tons in 1950-61 to 134 million tons in 1982-83 has, by and large, gone to the research workers. There has not been adequate recognition of the role extension education has played and the contribution extension scientists and extension workers have made. It would, therefore, be quite appropriate at this stage to mention some of the accomplishments of extension education besides the outstanding contribution in increasing agricultural production.

1. Extension education has introduced a new philosophy of education and has brought about a peaceful revolution particularly in the agricultural sector. It has succeeded in introducing science and technology through agriculture to the vast rural community and has helped them to plan and implement agricultural and other development programmes in a scientific way. In other words, it has helped the farmers to think and act more on scientific lines rather than the traditional way of thinking and acting.
2. It has enabled agricultural universities, colleges and research institutes to extend their frontiers beyond their four walls and look towards the real situation in the country side.
3. It has given orientation to agricultural research and has helped it to become more problem and programme based.
4. It has brought both the scientists as well as the farmers closer to each other and has demolished the artificial line of demarcation existing between them.
5. Extension has made the rural community, particularly the farming community, aware of its importance, rights and value and has created a feeling of self-confidence and self-respect.
6. It has emphasized that, for bringing about socio-economic transformation, it is not only the transfer of technology that is important but also changes in the social structure.
7. The concepts of developmental communication and developmental organization have successfully been introduced through the efforts of extension education.
8. Another important contribution of extension education has been to introduce successfully the inter-disciplinary approach for agriculture and also bring social science into the sphere of agricultural education, research and development.
9. Manpower development: One of the other major contributions of extension education has been to develop scientifically trained manpower for agricultural research, education and development. Today a large number of M.Sc.s and Ph.D.s have been produced from different universities and institutes who are manning key positions. The extension directorate of agricultural universities, research institutes and departments are also organizing a large

number of training programmes for continuous training to extension workers and farmers on scientific lines.

### Future Challenges of Extension

Extension education has always been engaged in helping people to solve their problems and accept new technology. These problems and challenges will now be more sharp and extension personnel will have to equip themselves to meet these challenges more promptly. Their attention is drawn specially to the following:

1. There will be increasing specialization in farm technology and, therefore, they will have to keep themselves up-to-date with respect to these trends and evolve and use matching extension technology and methods for taking the same to the farmers' field.
2. The existing knowledge and production gap between what the scientists have successfully demonstrated and what the farmers are practising will have to be thoroughly studied and ways and means found to bridge the gap.
3. As against the earlier approach of transferring individual farm technology, a stage has come where the transfer of technology has to be viewed in light of the total farming system. In other words, there has to be an emphasis on a system approach.
4. There is increasing income inequality among farmers resulting in growing discontent. The factors responsible for these situations and extension strategy needed to meet this challenge have to be worked out.
5. There has always been emphasis on the developing package of technological practices and, recently, the emphasis has also shifted to a package of services and government policies. That there is a need of developing a package of extension methods and communication media to reach all categories of farmers with a new package of technology and also a government policy have not been duly emphasized. A stage has been reached when extension educators must pay attention to this aspect.
6. The linkages between extension and the research system are still very weak and of an ad-hoc type. A stage has been reached where a regular mechanism has to be established for satisfactory communication between these two systems.
7. Since extension education is engaged in the transfer of scientific farm and other information, its own methods, techniques and approaches should also be matching and scientific in nature. This needs strengthening of extension research in the country.
8. The extension teaching programme both at the undergraduate and postgraduate levels needs reorientation. The recommendations

made by the Randhawa Committee (1976) should be implemented. The extension programmes and syllabus should have a well-balanced mix of subject matter as well as extension education and other social sciences. The area of training, communication and management need special attention.

9. The research in extension education is relatively a recent endeavour. After the initial emphasis on concept, philosophy, adoption and diffusion there is a shift towards more research in the area of communication, extension methods, training and developmental administration, which is a very happy sign. The recently completed All India Coordinated Research Programme in Extension Education in eight States of India has brought out many interesting results and there is need for continuing this kind of research programmes on a regular basis so that the problems and constraints of extension education are brought to the notice of planners, policy makers and administrators.

Since it has now been accepted that extension service is a professional service all efforts should be made to make it more professional by providing necessary training opportunities and supporting equipment and facilities. It is also necessary that extension scientists, specialists, and professionals are put in charge of various extension programmes at national, state and other levels.

In conclusion, it may be said that Extension Education now rests on a solid scientific foundation, has grown into a full-fledged discipline, has its own professional society—'The Indian Society of Extension Education'—with over one thousand members and is publishing its own research journal, 'The Indian Journal of Extension Education.' It has played a key role in India's development programmes, particularly rural and agricultural development programmes, and has come to stay. Its future is bright—let us make it brighter.

### Constraints of Extension/Advisory Service

Almost all the developed and developing countries have evolved their own extension or advisory services. They may differ in form and organizational structure but their goal is the same, viz., to bring about socio-economic transformation and qualitative change in the life of the people through application of science and technology. But it is difficult to find in many developing countries a really effective extension service. There are many reasons for this. Some of the important ones are:

*Organizational constraints:* Most of the extension services suffer from lack of a single, direct line of command and technical support. The extension workers at the village or farm level have to perform multipurpose roles and work under a number of supervisors at the same time with the result that

they get little time for production oriented agricultural extension activities. The crop production extension work is a specialized technical job and farmers need technical advice and guidance regularly and not casually. The agricultural extension worker, therefore, should be directly under the technical and administrative control of the agriculture department.

*Jurisdiction and mobility:* Usually field level extension workers have large jurisdictions and numbers of farm families to work with. In India, the number varies from 2000–5000 farm families per worker spread over a large area. This makes it impossible to establish close contact with farmers and render timely advice. Their mobility is also restricted for want of transport facilities. This has to be reduced both in terms of area and number. One extension worker could manage 500–700 farmers, depending upon the cropping system, crop intensity and agro-ecological condition of the area.

*Professional competence:* Due to the multipurpose nature of the work, larger jurisdiction and inadequate and outdated training facilities, most of the lower level extension workers are professionally weak and possess poor agricultural knowledge and skill. In order to keep the extension workers technically sound and up to date with modern crop production technology, their training programme has to be reorganized and made more purposeful, practical and linked with various crop production operations. For this, the research institutes and agricultural universities have to play an important role. In this connection, the methodology developed in the 'Training and Visit System' appears to be quite effective.

*Lack of effective linkage between research and extension:* One of the main constraints in crop production is little or no linkage between research and extension which is detrimental to the effectiveness of both. Without a continuous and free flow of crop production technology from research institutes to farmers' fields, the extension service becomes non-professional and loses its credibility and has nothing new to extend. Similarly, for want of feedback from extension workers and farmers, the research becomes mostly academic and unrelated to farmers' real problems. It is, therefore, necessary to have a built-in mechanism for effective linkages and communication between research institutes, agricultural universities and extension services.

*Duplication of services:* It has been observed in many developing countries, including India, that a number of agencies function in the same area, with the same objectives and try to reach the same target groups, i.e., the farmers. This amounts to duplication of efforts and activities, wast of scarce resources and sometimes even competition and conflict. This should be avoided. The specific areas of work and roles of various agencies should be delineated and defined and responsibility fixed in order to rectify the above situation.

*Status of Extension Service:* As a result of the above mentioned con-

straints and problems, the extension service occupies a low status, has low morale and low salary which ultimately affects its productivity, initiative and credibility.

To make the extension/advisory services more dynamic and productive, their professional, social and economic status must be raised and they should be treated at least on a par with research and other services, if not better.

## COMMUNICATION WITH FARMERS

Communication viewed in the larger context is multi-disciplinary in nature and operates within a unique social, psychological, economic, political, cultural and administrative milieu. All communicators, therefore, particularly those engaged in rural communication for bringing about the socio-economic transformation of rural masses based on science and technology must recognize the importance of these dimensions. This is more important for developing countries with so much diversity in their farming systems, agroecological situations, level of development and extreme variations in socio-psychological, economic, communication, educational and adoption behaviour of the people. Communicating with the farmers for increasing agricultural production by using new agricultural technology and efficient and economic use of modern inputs, particularly chemical fertilizers, pesticides, H.Y.V. seeds, credit etc. depends upon the communication and application of new knowledge and skills through appropriate extension methods and techniques and communication media. In fact, there is need for a communication strategy which should be an integral part of any overall planning for developmental and promotional programmes and it should be recognized by planners, policy makers, administrators, scientists, extension personnel, industrialists and others as an ingredient of equal importance as compared to the other components of the developmental process.

Before discussing in detail how to communicate effectively with farmers and the transfer of technology mechanism, it would be appropriate to discuss the models of the communication process, methods of communication with farmers and problems of communication for agriculture and rural development.

### Meaning and Models of Communication

There are several definitions of communication given by communication scientists. But the one given by Leagans (1961) has been quite close to extension concepts. According to him 'Communication is a process by which two or more people exchange ideas, facts, feelings or impressions in a way that each gets a common understanding of meaning, intent and

use of the message.'

Hovland (1964) defined communication as 'a process by which an individual the communicator transmits (usually verbal symbols) to modify the behaviour of other individuals the communicatee.'

There are many other definitions of communication. Although there is no complete agreement on a single definition, most of them imply process, interaction and effects and recognize that there are several elements in the communication process.

Each communication situation differs in some way from every other one, yet certain elements that are common to all communication situations can be isolated. It is these ingredients and their relationships that are considered while trying to construct a general model of the communication process.

Many attempts have been made by communicators and social scientists to develop models of the process (i. e. description and listing of ingredients). These models vary. None can be said to be perfect or complete. Some may be more useful than others. Some may correspond more than others to the current state of knowledge about communication. A few of these models are discussed here to give some insight of the process.

- I. Aristotle (1946)
  1. The speaker
  2. The speech
  3. The audience
- II. Shannon and Weaver (1947)
  1. A source
  2. A Transmitter
  3. A Signal
  4. A Receiver
  5. A Destination
- III. Schramm (1954)
  1. Source
  2. Encoder
  3. Signal (message)
  4. Channel
  5. Decoder
  6. Receiver
- IV. Rerlo (1960)
  1. The Communication source
  2. The Encoder
  3. The Message
  4. The Channel
  5. The Decoder
  6. The Communication Receiver
- V. Leagans (1963)

1. Communicator
  2. Message
  3. Channel
  4. Treatment of Message
  5. Audience
  6. Audience Response
- VI. Fano (1963)
1. Source
  2. Source Encoder
  3. Channel Encoder
  4. Channel
  5. Channel Decoder
  6. Source Decoder
  7. User

There are other models of the communication process developed by Westlay and MacClean (1957), Fearing (1953), Johnson (1953) and others. A comparison will indicate great similarities among them. They differ partly in terminology, partly in the addition or subtraction of one or two elements and partly in the differences in the points of view of the disciplines from which they emerged as will be seen from the following discussion:

*Aristotle's Model:* In the Rhetoric, Aristotle said that we have to look at three communication ingredients:

- the speaker
- the speech, and
- the audience

He meant that each of these elements is necessary to communicate and that we can organize our study of process under the three headings: (i) the person who speaks, (ii) the speech that he produces, and (iii) the person who listens. Most of our current communication models are similar to that of Aristotle.

*Shannon and Weaver's Model:* One of the most widely used contemporary models was developed in 1947 by Shannon (a mathematician) and Weaver (an electrical engineer). In their model they were talking about electronic communication. Yet behavioural scientists have found this model useful in describing human communication. The ingredients in their model include:

- a source
- a transmitter
- a signal
- a receiver, and
- a destination

The Shannon-Weaver's model certainly is consistent with that of Aristotle. If one takes the source as the speaker, the signal as the speech, and the destination as the listener, one gets the Aristotelian model, plus



two added ingredients, a transmitter which sends out the source's message, and a receiver which catches the message for the destination.

*Ferlo's Model:* All human communication has some source. Given a source with ideas, needs, intentions, information, and a purpose for communicating; a second ingredient is necessary for communicating. The purpose source has to be expressed in the form of a message. How does the source's purpose get translated into a code, a language? This requires a third ingredient, an encoder. The communication encoder is responsible for taking the ideas of the source and putting them in a code, expressing the source's purpose in the form of a message. The fourth ingredient needed in a communication act is a channel. A channel is a medium, a carrier of a message. The choice of channel is an important factor in the effectiveness of communication. When we talk, somebody must listen; when we write somebody must read. The person/persons at the other end can be called the communication receiver, the target of communication. Just as a source needs an encoder to translate his purposes into a message to express purpose in a code, the receiver needs a decoder to retranslate, to decode the message, put it into a form that the receiver can use. So according to Berlo (1960), the ingredients in a communication process include:

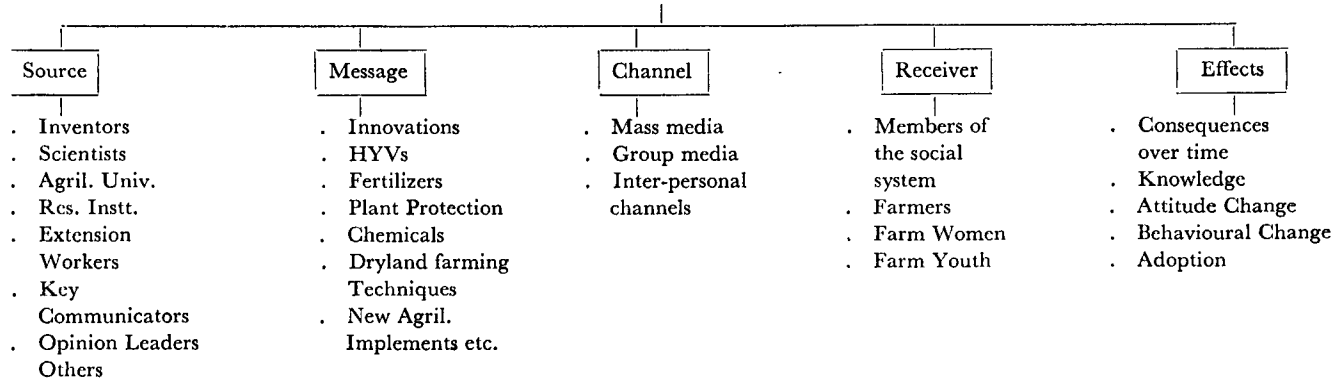
- the communication source
- the encoder
- the message
- the channel
- the decoder
- the communication receiver

*Leagans Model:* This model is not different than the Schramm or Berlo model. What he has done is to make it more clearer and usable by extension personnel and the common communicator. He uses the terms "treatment of the message" and "the audience response" to make the model clear and simple. In the Feno model, the role of encoding and decoding has been made more explicit and clear.

*Communication process:* From discussion of these models it is clear that communication is a process having continuity and distinct elements such as communicator (researchers, scientists, extension workers, key communicators, etc.), message (new discoveries, innovations, new ideas) and its treatment, channel (mass communication media, interpersonal and other communication channels) and recipient (towards eliciting a specific intended response from the recipient).

In order that the process be complete and bring the intended response (a desired behavioural change), it is crucial that these elements are well-balanced, one fitting into the other. A defect in one may lead to the breakdown of the entire process. The balance, however, is seldom found in rural or farm situation. The problem is aggravated by scores of factors operating at each element—the determinant of communication effectiveness—the

FIGURE 4 ELEMENTS OF THE COMMUNICATION PROCESS



fidelity of the process. These elements of the communication process are presented in Figure 4.

### Major Communication Systems in a Society

Taking an overall view, the major communication system may be summarized as follows.

- the governmental, administrative structure, composed of ministries and other central authorities, as well as regional and local government agencies. This system of communications must be seen as operating in two dimensions: horizontal in terms of the information flows between the government agencies and vertical in terms of the information flows of the authorities to the citizens.
- the communication systems represented by the major public, semi-public or private organisations and interest groups such as religious establishments, labour unions, co-operative movements, women's and youth associations, etc.
- the educational systems, both the formal system and the adult education system.
- the cultural and mass media system including not only the press, cinema, broadcasting etc., but also other organized cultural channels such as theatre, leisure groups, etc.
- the change agency system which is, of course, closely related to the first two but still is important enough to warrant a category of its own: it often consists of special networks established for special purposes such as agricultural development and extension rural health development and family planning etc.
- the traditional and informal communication systems: village councils, markets and fairs, etc.

### Farm Information Communications Systems in India

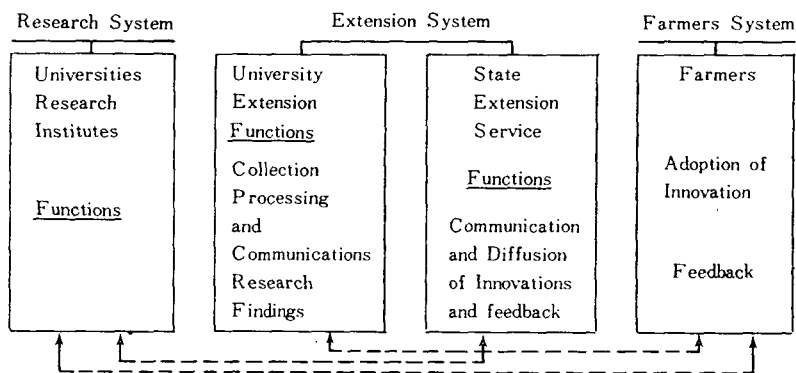
With the preceding discussion of concepts and models and systems of communication, it would be appropriate here to take up some specific examples here of agricultural communication and how these concepts and models have been put in actual practice. It is proposed to discuss the Indian Farm Information Communication System—engaged in communicating with farmers.

#### The Linkage between Agricultural Research, Extension and Farmers for Effective Communication

For bringing about increased agricultural production there has to be remunerative and appropriate farm technology evolved through scientific research and its timely and quick communication to the farming com-

munity. This requires a series of integrated and communicable linked systems to generate and diffuse farm information and innovations which, in turn, involves three systems: a) Research systems—responsible for generating and evolving new agricultural technology and innovations, b) linking (Extension) system—responsible for transfer of new technology, facilitating its adoption and also bringing back the field problems to the research systems (feedback) and c) the client systems (farmers)—the ultimate users of technology. Figure 5 represents these systems and their linkages. It would be appropriate at this stage to discuss in brief these three systems and their role in the agricultural development process.

FIGURE 5 LINKAGE BETWEEN RESEARCH, EXTENSION AND FARMERS



It is necessary to understand the nature of linkages and communication patterns between and within the three systems. This understanding, unfortunately, is poor and inadequate at present, resulting thereby in distortion and loss of messages in the process.

*The National Extension Service:* The Agricultural Extension Service is primarily responsible for dissemination of farm information to and education of farmers and helping them to integrate the same in their farming system. The organizational set up and functioning of the Extension System have already been discussed in the first part of this paper. The Extension Service with its network at national, state, division, district, block and village levels is responsible for horizontal as well as vertical communication. It takes the new farm technology from Research Institutes, and Agricultural Universities to farmers and brings back their reaction and problems to the scientists.

As described earlier, the Extension Service has been recently re-organized to make it more professional and help in accelerating the flow of farm information. It uses extension methods and communication media of all types—individual and group contact methods as well as mass media in-

dividually and in combination according to the nature and characteristics of the technology and farming community.

*Directorate of Farm Information Government of India:* The Ministry of Agriculture and Irrigation, Govt. of India has had its own Farm Information Directorate since 1958. This unit is handled by the Director, Farm Information, assisted by three Joint Directors for audio-visual aids, publications and organization of exhibition duly supported by other subordinate staff. This unit is responsible for providing technical information and communication support to the different divisions under the Department of Agriculture and Rural Development, State Departments of Agriculture, Extension personnel at different levels and to the farmers. This Directorate plans and produces different kinds of information and communication materials including extension literature, audio-visual aids and organizes from time to time agricultural exhibitions throughout the country.

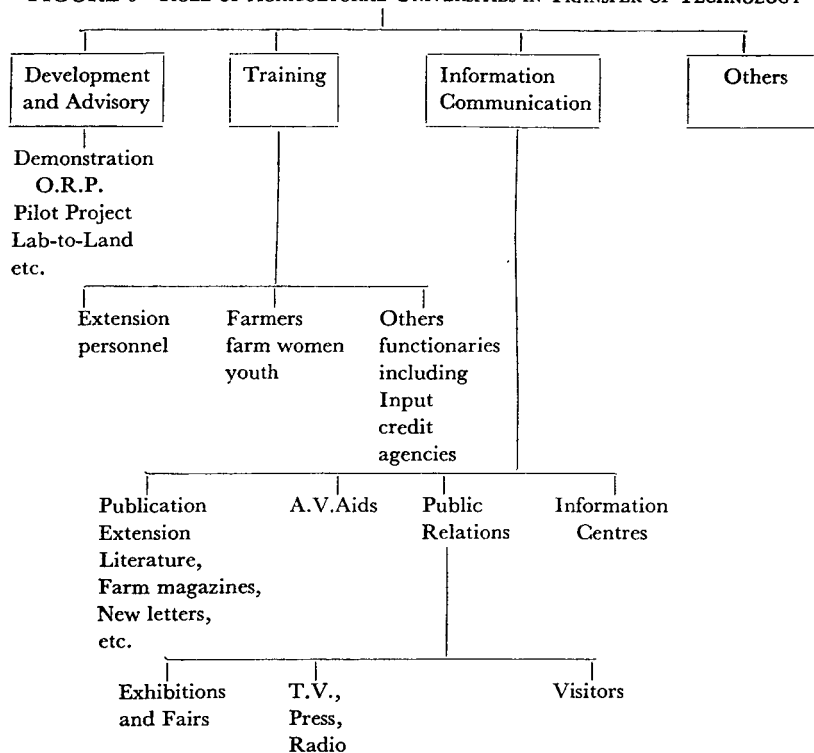
*Information Communication System of ICAR:* The Indian Council of Agricultural Research with its 39 Research Institutes also has its own information units. Three of the Institutes—Indian Agricultural Research Institute, Indian Veterinary Research Institute and National Dairy Research Institute—have regular divisions of agricultural extension and others have extension units for communication and transfer of new agricultural technologies evolved by the Resides. Programmes like National Demonstrations, Operational Research Project, Krishi Vigyan Kendras, Lab-to-Land Programme, Krishi Vifiyan Melas etc., are also playing an important role in transfer of farm technology and education of farmers.

*Communication System of Agricultural Universities:* The 23 agricultural universities in India have departments of extension education and communication with the responsibility of farm advisory service and transfer of technology in their respective states. Some of these universities have also their own communication centres for the production of information materials, extension literature, audio-visual aids and recording of programmes for radio and television to support their own extension education activities and agricultural extension programmes run by the Department of Agriculture (Figure 6).

*Other Agencies:* Considerable agricultural extension work is also being done by public and private industries like fertiliser and pesticide companies, farm implement and machinery manufacturers and suppliers, and the nationalized banks. Many voluntary organizations are also making efforts to educate farmers about new farm technology and to help in rural development. The 61 All India Radio Stations and 31 Television Centres play an important role in communicating agricultural technology to farmers. There are over 250 farm magazines engaged in information transfer and feedback.

It will be evident from this resume that there are a large number of agencies and organizations engaged in disseminating agricultural techno-

FIGURE 6 ROLE OF AGRICULTURAL UNIVERSITIES IN TRANSFER OF TECHNOLOGY



logy. But there is inadequate coordination of their efforts though they are all trying to reach the same target audience, namely the farmers.

#### Problems in Agricultural Communication: Production and Knowledge Gap

In spite of a well-organised and established network of research and extension systems in India, there is a wide gap between experimental results achieved by scientists and National Demonstration one hand, and the National Demonstrations and farmers' fields on the other, which can be seen from Table 1. Even though the overall food production in India has increased

TABLE 1 YIELD GAPS IN MAJOR CEREAL CROPS, (1977-78).

Crop	Average Experimental yield (q/ha)	Average National Demonstration yield (q/ha)	National Average (q/ha)
Rice	80	51.77	23.17
Maize	90	34.30	10.43
Pearl Millet	40	26.22	4.27
Sorghum	70	42.95	7.26
Wheat	75	36.65	14.77

remarkably from about 50 million tons in 1949-50 to about 134 million tons in 1982-83, there is a wide gap between the known agricultural potential and its adoption on farmers' fields.

One of the main reasons for the production gap is weak linkage between research and extension and a poor communication system, with the result that there is a loss and distortion of the original message in the communication process. And Table 2 clearly brings out this fact.

TABLE 2 LOSS OF INFORMATION FROM RESEARCH TO EXTENSION SYSTEM

Levels	Message 1	Message 2	Message 3
Research System			
Original message	100.00	100.00	100.00
Extension System			
District level	55.27	70.12	80.77
Block level	52.16	62.20	71.24
V.I.W level	28.74	43.73	56.62

Message 1. Floiar sprayer of urea on wheat crop.

Message 2. Control of stem borers in maize crop.

Message 3. Use of 2·4-D Weed control.

#### Methods and Techniques for Narrowing (technological) and Production Gaps

Though there are many factors responsible for technological knowledge and production gaps like poverty, lack of resources, non-availability of inputs and credit, high cost of inputs, unremunerative prices etc., the farmer's ignorance and lack of knowledge and skill of modern agricultural technology is crucial and impedes agricultural progress. This is, in turn, due to weak linkages between research, extension and client (farmers) systems, a weak information and communication system, failure to use appropriate extension methods and techniques, the farmers' characteristics and level of development and, above all, a lack of understanding and emphasis on the role of extension education and communication in the transfer of technology.

In order to narrow the technological knowledge and yield gaps, a thorough understanding of the communication process, knowledge and skill in selection and use of appropriate extension methods and communication media is essential. Studies in the field of communication indicate the existence of differential communication and source-channel credibility as perceived by different categories of farmers. Tables 3 to 5 very clearly bring out these facts.

#### Media Mix Approach

It is a well known fact that no one communication method, source, or channel could be effective for all situations. It is always exposure to the same idea through proper combinations of suitable media and methods in logical

TABLE 3 FARMERS' CREDIBILITY OF INFORMATION SOURCES (SINGH-1981) ALL TYPES OF FARMERS

Source	Credibility score
1. Demonstration	2.09(1)
2. Scientists	1.93(2)
3. Block Extension Agency	1.65(3)
4. Progressive Farmers	1.73(4)
5. Television	1.27(5)
6. Radio	0.68(6)
7. Folders, leaflets, bulletins	9.11(7)
8. Newspapers	—(8)

Figures in brackets indicate ranks.

TABLE 4 DIFFERENTIAL CREDIBILITY PATTERN OF INFORMATION SOURCES

Progressive Village/Farmers	Non-Progressive Village/Farmers
1. Specialists	1. Demonstration
2. Radio	2. Progressive Farmers
3. Progressive Farmers	3. Specialists
4. Block Extension Agency	4. Block Extension Agency
5. Demonstrations	5. Radio
6. Folders	6. Folder
7. Newspapers	7. Newspapers

TABLE 5 EFFECTIVENESS OF AUDIO-VISUAL AIDS

Film strip	Slide	Photograph	Flash cards	Flannel graph	Film show
Mean value	15.30	14.85	10.86	8.95	6.80

sequence which increases communication efficiency. Some such media mix based upon recent work done at I.A.R.I. (India) are summarized in Table 6. These are just a few of the examples; there could be many more of 2, 3, and sometimes 4, media-mix combinations depending upon the situation and technology. It might be, however, mentioned here that

TABLE 6 SUITABLE MEDIA MIX

Media Mix	Overall effectiveness score	Rank	Remarks
1. Radio + Slide show + Field trip	14.58	1	Found statistically similar in terms of effectiveness
2. Wall painting + Slide Show + Field trip	14.45	2	
3. Poster + Slide show + Demonstration	14.25	3	
4. Exhibition + Group discussion + Demonstration	12.96	4	
5. Film + Group discussion + Demonstration	12.60	5	
6. Wall painting + Group Discussion + Demonstration	11.76	6	
7. Radio + Folder + Demonstration	11.64	7	
8. Film + Folder + Demonstration	11.25	8	



though there are variations in the effectiveness of channels their effectiveness could be optimized by taking steps towards making qualitative changes in content, mode of presentation and relevance of message to various categories of people.

#### **Need for Integrated Communication Strategy**

The foregoing discussion has highlighted the growing and undispendible role of communication in transfer of technology to promote and facilitate agricultural development. The essence of communication is to bring to the farmer and his family in a unified, coherent, usable form the information they need for participating in the agricultural production programmes and sharing the benefits of modern agricultural technology. A well-balanced communication strategy based on an integrated communication approach, therefore, must form an essential part of integrated rural and agricultural development programmes. The integration may take the form of a national official memorandum of agreement between the concerned Ministries like Agriculture, Rural Development, Information and Broadcasting etc. Or it may be informally at official levels, (i.e. between officers of different departments at supervisors and extension agents levels). The essential requirement is agreement at whatever level to harmonize the official programme in which the farmer is asked to participate. Integrated communication strategy can support farm information transfer more effectively than the present disintegrated approach. This can be achieved in three ways: (1) by integration of messages in the case of mass media like Radio, TV, and Press etc. (ii) in inter-personal communication, and (iii) inter-agency and intra-agency communication.

The studies in the field of communication indicate the existence of differential communication patterns and source-channel credibility as perceived by different categories of recipients. For example, for illiterate and semi-literate farmers with small landholdings and a low level of adoption, demonstration on farmers' field, use of audio-visual aids like slides and film strips, and communication through informal local leaders and progressive farmers as key communicators and interpersonal communication appear to be more effective and rewarding whereas for progressive farmers, Radio, T.V., printed materials, specialists and scientists were found to be more effective and helpful. It might also be mentioned here that no one communication method can be most effective under many given situations. It is always the exposure to the same idea through proper combinations of suitable media in logical sequence which increases the communication efficiency.

In order to formulate the communication strategy, more information on extension methods and techniques and communication media based on scientific studies is required. There is, therefore, a need for collaborative research and experimentation to perfect the existing media and research

and to evolve new ones, find out their effectiveness individually and in various combinations and develop a package of media and methods for different situations and types of clientele. This role can be performed very well by agricultural universities and research institutes. Along with the new agricultural technology and package of practices we must also develop a package of extension methods and media duly tested and perfected and supply the same to field extension workers.

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