

A PROPOSAL TO INCREASE AGRICULTURAL PRODUCTION THROUGH EFFECTIVE
COMMUNICATIONS BY AGRICULTURAL UNIVERSITIES IN INDIA

by 45

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CHAPTER I

INTRODUCTION

India has been a land of sages, but definitely not a land of sufficiencies in agricultural production in the recent history. Multiplying millions of Indian people who form about 14 percent of the world's total are crowded into just 2.4 percent of the world's land surface. This enormous population of over 500 million has to be fed, clothed and sheltered adequately. Nowhere else do so many linguistically differentiated people so many varying cultures and traditions and so much illiteracy and so many sociological problems exist.

Agriculture is the occupation of over 70 percent of the population. President Zakir Hussain of India, in a national broadcast, August 14, 1968 on the eve of the 21st Anniversary of Independence observed, ". . . a breakthrough in agriculture is in sight, its materialization depends on our ability to tackle the formidable problems of agricultural organization. It needs to be plainly admitted by all that the failure has been on the human side and there lies the greatest challenge to us. . . ."

If agriculture development has to take place in India, with greater momentum, we have to know and understand a little beyond the villages and that it is our responsibility in diffusing agricultural information toward modernization. This need for information applies not only to the farmers, who are fundamental producers of agricultural wealth, but to all concerned in marketing, processing and ultimate consumption of the product.

Agricultural information is a consumable product and perishable too, if not transported in an effective manner. This transportation of information

should result in something more than simply possessing the product (the knowledge)--it has to motivate the farmer to utilize (consume) the information, so that increased agricultural production results.

The farmers of India, with their innate abilities, fine qualities and leadership potential, would make a strong base on which to build a modern nation, only if they change. Otherwise, they will watch technological growth from the sidelines; social change will happen to them rather than their playing an active part in bringing it about; they will be a part of the relatively inert mass out of which the leaders of development in the country are trying to fashion something dynamic and vital.

Effective and efficient communication can offer a possible way to overcome this situation.

This report, dealing with a proposal to increase agricultural production through effective communications by the Agricultural universities in India attempts to discuss the problems of Indian agriculture, the elements, and processes of communication and suggests that communication centers which can teach, extend communication and undertake research in communication are necessities.

1. Communication--A Major Problem in Increasing Agricultural Production

Nearly all authorities on the world food situation have agreed that agriculture is an important occupation in most developing countries. A sound national economy depends on a sound agricultural economy, a sound industrial economy and communication among all concerned. What are the possibilities and prospects of improving communications in achieving increasing agricultural production in a country like India; i.e. how does

communication help increase agricultural production; and how could we communicate to farmers the information needed, and to extension personnel whose suggestions for innovations are accepted?

The results of any agricultural development program basically depend on two factors. First, scientific and rational prescriptions to specific problems (39, p. 1). Second, and more important, dissemination and diffusion of agricultural information to the farmers.

Communication is vital to progress. Ignorance is one of the chief allies of poverty. Ignorance may result from being either uninformed or misinformed. Ignorance and illiteracy are not synonymous. A person who can read, but does not, is no better than a person who cannot read. Literacy can open the door to knowledge, however, and thus may be a big step toward dispelling ignorance. Knowledge of truth is like a great light; it dispels the darkness of ignorance and superstition. (13, p. 1)

2. Agricultural Production--An Interrelated Problem

Dr. S. Radhakrishnan, Indian philosopher and second president of the Indian nation, once said that all culture flows from agriculture; thereby indicating the priority and importance of agricultural development, coupled with development of human resources. Agricultural development and production, however, cannot be singled out from other related development programs. It is an intensely human phenomenon--technology, social organization and both personal attitudes and values are involved. And, according to Mosher (35, p. 40), the relationships are reciprocal, each affecting the other. But the attitudes and values of persons have a measure of autonomy not freely shared by the other factors, because it is persons who invent or develop technologies and it is persons who mold social organizations. This interplay of factors is something completely external, yet highly important,

to the professional agent of change. Man's abilities and values as expressed in personal behavior are a vital process of agricultural development, Mosher stated.

3. Problems of Indian Agriculture

Among many other problems of Indian agriculture, the most serious are:

(i) The basic problem of Indian agriculture continues to be low productivity. Average yields per hectare of some of the most important crops rank among the lowest in the world (Table 1).

Table 1. Yields in 100 Kgs./Hectare

Country	Rice	Wheat	Maize	Millets and sorghum	Sugar- cane	Cotton (lint)
Japan	50.9	24.3	24.2	15.6	608	1.0
U.S.A.	48.5	17.7	45.4	35.0	590	5.9
France	35.7	28.3	45.4	15.9	NA	NA
U.S.S.R.	28.7	14.4	26.1	9.5	NA	7.8
Iran	23.3	7.6	8.8	4.4	292	3.6
Pakistan	15.7	7.5	10.6	4.4	370	2.7
Brazil	14.5	8.6	13.1	NA	463	1.7
Philippines	13.5	NA	6.6	NA	456	3.6
Netherlands	NA	40.4	40.0	NA	NA	NA
India	12.8	8.2	9.9	4.0	398	1.1

Source: Production Year Book, Vol. 21, FAO, United Nations, Rome, 1967.

(ii) Eighty-two percent of India's total population of more than 500 million live in villages where roads and transportation facilities are scarce, and radios, telephones and suitable publications, including newspapers and other communications for farmers, are rare.

(iii) Seventy percent of the population depends on agriculture and the land for their living.

(iv) More than sixty percent of India's farms are small, fragmented, and rarely fertile or productive. About 60 percent of the operational holdings are below five acres (26, p. 10).

(v) Agriculture is carried on more as a way of life than as a business.

(vi) Farming still depends on the crudest implements, and bullocks or humans generally are the primary source of field power in most Indian states.

(vii) Weather is important in determining productivity, and it is most uncertain and unpredictable, as demonstrated during the recent drought years.

(viii) The conditions of production differ a great deal from area to area, necessitating wide variations in productivity techniques and in recommendations.

(ix) The 1961 census enumerated 1652 mother tongues in India; 14 are recognized as official languages in various parts of the country (3, p. 13). Each language, particularly those recognized, carries with it cultural, traditional and sociological problems.

(x) Illiteracy is a foremost problem. Only about twenty-four percent of the total population is literate (3, p. 62). There is only one well

educated person per 10,000 laborers* compared with one per 200 in the United States and one per 400 in other leading countries (8, pp. 22-24).

(xi) The farmers are nearly all economically poor.

(xii) Farmers follow less profitable methods because they are not aware that better methods exist, far from thinking of utilizing better methods on their own fields.

Brown (11, p. 15) suggested that most of the increases in food required to meet the projected increases in demand over the remainder of this century must come from raising the productivity of land already under cultivation. That is the most significant single fact to be considered in seeking a solution to the food-population problem.

Surface (49, pp. 1-3), who worked in India for two years, suggested that:

The basic problem is need for wider application of the advanced knowledge already known in India. Too little advanced information of more productive techniques trickles from the research stations to the hundreds of millions of small cultivators. One of the main reasons the Indian farmer follows less profitable traditional methods is that he simply does not know how to use better ones. In many cases he is not even aware that better ones exist, let alone that he can utilize them on his own land.

In so large and diverse a country as India, almost all methods and media of communication could be utilized in at least one place or another. However, effective communication of useful farming ideas can best be done by

*United States, rather than English, spelling is used throughout the manuscript as it was prepared for a Graduate School in the United States.

carefully selecting media that can give the most benefit in return for the least relative cost--mass communications.

4. Community Development, Extension Education and Communication

India embarked on a program of community development with the fundamental objective of "destination man," when she had thrown off the yoke of British colonialism in 1947. Community development is a movement to promote better living for the whole community, with active participation of the people, on the initiative of the community. However, if this initiative is not spontaneous, community development agents resort to certain techniques to arouse and stimulate the initiative of the masses by educating them. Community development, therefore, has been variously referred to, as a process, a program, a procedure, a method and an objective. It is generally agreed that extension education is the activating force behind community development but it is only appropriate communication that activates the process and programs of extension education.

Extension education teaches the rural masses ways to improve their farms, homes and community institutions and to solve their interrelated problems. Experience in India has confirmed that methods of community development must be those of extension education. "India's program is unique in that it is both a community development and an extension program" (5). It is a community development program in that its major objective is to develop rural communities with greater reliance on self-help. It is an extension program in that it acts as a two-way channel--it brings scientific information to the rural populace and also takes their problems, which often are beyond their comprehension, to the research stations for solutions.

The relatively recent concept of communication is one born of necessity. Many extension workers and agencies in India not only need to know more about the techniques of teaching but also the art of communication. Complex technical or scientific information has been of little use to them. They have difficulty understanding such information and they find little in it to use to solve their problems or the problems of farmers.

"The future . . . is in the hands of two men--the investigator and the interpreter. We shall never lack for the administrator, the third man needed to complete this trinity of social servants. We have an ample supply of investigators. But there is a shortage of readable and responsible interpreters--men who can effectively play mediator between the specialist and laymen," said Glenn Frank (46, p. 11).

The preceding suggests an information gap between the farmers on one hand and scientists on the other. The gap results from a communication lag between the scientist, the extension worker and the farmer. Educating all three, and more particularly the farmer, could shorten the lag in communications.

Current recognition of the crucial role of education and communication in development stems in part from the urgent prodding of world food needs, which arise both from rapid population growth and from lagging agricultural production in developing countries like India.

5. Communication Important

In India's rural development plans communication's importance is evident.

The wide distribution of relevant, specific and practical knowledge of

improved agricultural practices is one of the main reasons for the success of American farmers. The land-grant universities have played the primary role in diffusing agricultural information. Any university that seeks to serve the agricultural community must be sure that its information reaches the farmers in an understandable form, a task of highest priority.

6. Agricultural Universities and Agricultural Communication Services

It is now generally accepted that education of the farmers is the only way for change to be accepted and sustained.

It is in this context that agricultural universities are being set up in India on the pattern of the land-grant institutions of the United States--to teach and train students, practical research workers, and active extension personnel. One of the major objectives of agricultural universities is to provide education for the rural people and help them apply the new knowledge to their conditions, so increased agricultural production results. This approach of the Government, which is the most recent, should help increase agricultural production in India.

To close the gap and supplement the efforts of the extension services, in developing agriculture, an agricultural communication service is needed. Such a service could accelerate agricultural development, not only in the regions near the agricultural universities but in the entire country.

India's future seems to be darkened by two factors--underproduction of food, feed and fiber and overproduction of population. Her leaders must communicate to and educate the masses as to how to alleviate both problems. Technologies are available for both. They must be communicated in an understandable way, and more important and more difficult, in ways acceptable to

the masses. Planned programs of education and principles of communication can light candles for all of India's darkest problems. And after all "It is better to light a candle than to curse darkness."

CHAPTER II

BASIC PROBLEM: BALANCING FOOD NEEDS AND POPULATION

The problems of improving agriculture and increasing food production are largely synonymous and correlated. Food is strength not only to individuals but also to nations. Any nation that cannot feed its people adequately cannot hope to play any great part in world affairs and may not even survive long. The gap between population and food production has been growing wider in India during the last two decades. Many are aware of the difficult food position that India inherited with her Independence. The country continues to depend on progressively large food imports as indicated (3, p. 212):

<u>Year</u>	<u>Food grain imports in thousands of tons</u>
1956	1,443
1961	3,495
1962	3,640
1963	4,556
1964	6,266
1965	7,462
1966	10,358

According to a study (conducted by the Economic Research Service, United States Department of Agriculture in 1965) of the 26 developing nations including India, agriculture is the most important industry and accounts for more than a third of the gross national or domestic product in 19 of 26 of the countries.

Discussing the need for developing agriculture, the report stated (2, p. 3), ". . . some progress has been made during the past decade toward closing the gap between world food needs and food consumption. Even so, food consumption levels, based upon daily per capita intake of calories, are below desirable levels in 11 of the 26 countries studied. India is included among the 11."

The food deficits are great. "For example," the report says, ". . . if the supplies of India were distributed as far as they would go at the rate of 2,300 calories per person per day, about a tenth of the population would be left totally without food. If the same food supplies were distributed at the United States' consumption rate of 3,190 calories per person per day, more than one-fourth (125,000,000) of India's population would be without food."

Alongside the low agricultural production is the rapid increase in population. Less developed or developing countries, including India, are almost by definition those with rapid rates of population growth. This phenomenon, aptly termed the "population explosion," though recent, is making an immeasurable impact on the already low and distressing food output.

Rising food prices, from low production and increased demand, cause inflation and reduce expenditures for developmental activities and economic growth. The effective demand for food is outrunning available supplies even with sharply increasing imports.

As food prices rise, upper and middle income groups increase their expenditures for food, but the low income groups, already using about four-fifths of their limited income to buy food, cannot increase expenditures enough to offset the price rise. They buy less and tighten their belts.

This results in social unrest, demonstrations, and riots with revolution possible.

Over the past several years prices of food grains in India have been sharply rising. That indirectly widens the gap between the have and have-not communities, which is not a healthy situation. Economic and political stability depends more on adequate food production than on any other single factor.

Research bears evidence that lack of proper food in the early stages of life may stunt both physical growth and mental development. The malnourished child of 1968 is the underdeveloped adult of 1988. "Malnutrition is by a wide margin, the world's number one health problem" (11, p. 14).

Industrial growth, which to a large degree depends on the raw material supplied by agriculture, is stunted by low agricultural production.

The visible symptoms of food shortages like inadequate food supplies, rising food prices, less food for the low income classes, economic and political instability, social unrest and even violence in some cases are intertwined with low agricultural and food production trends.

To summarize:

Agriculture is the biggest occupation in India. Agriculture needs to be efficient if the general productivity of the country is to rise satisfactorily.

Agriculture produces most of the food on which human life depends and it produces many fibers and industrial raw materials.

The purchasing power of rural people is a major part of the market for nonagricultural industries. In India, where most of the people are engaged in farming, a considerable amount of the country's purchasing power depends

on the prosperity of the agricultural sector.

A great many people will continue to depend on agriculture for a livelihood for many decades. With the rapid rates of increase in population that characterize India, and with a high capital cost of creating nonagricultural employment, it is unlikely that the absolute number of people engaged in agriculture will drop significantly for a long time.

Changes in agriculture produce changes in people--their knowledge, skills and attitudes--so, improvement in agriculture would improve society.

1. A View of the Present Situation

Agricultural development resulting in increased food production is taking place in India. It is a big job and seems to be going too slowly. To improve the difficult food situation in India, many development programs have been initiated with the intention of further increasing and augmenting agricultural productivity. These are as follows:

(i) Developing major irrigation resources and improving minor irrigation sources resulting in an enormous expansion of irrigation by wells and ground water. Special projects, like the pre-investigation of ground water and development surveys, are also being undertaken with the aid and cooperation of the United Nations organization and other aid programs.

(ii) Effective soil conservation, dry farming and land reclamation schemes have been put into operation.

(iii) Extensive distribution of fertilizers and operating schemes of green manuring, and rural and urban composting.

(iv) Distribution of improved and high yielding varieties of seed, and establishing central/state seed farms to produce the new varieties in

adequate quantities.

(v) Undertaking plant protection work on an intensive and extensive scale.

(vi) Initiation and implementation of intensive agricultural area and district programs, and crop insurance.

(vii) Providing loans in cash and kind to needy farmers.

(viii) Improving existing marketing facilities by introducing regulated markets and storage and warehousing facilities.

(ix) Educating the farmers by adult education and extension.

(x) Electrification of rural areas for water pumping sets to facilitate lift irrigation.

(xi) Providing incentives by crop competitions and honoring the farmers publicly.

(xii) Providing improved agricultural implements and other agricultural inputs at subsidized cost.

As a result of these programs:

(i) Total cropped area has increased by 26.1 million hectares from 1950-51 to 1965-66 (3, p. 207).

(ii) Net irrigated area increased by about 500 million hectares from 1950-51 to 1963-64 (3, p. 207).

(iii) Total area under food grains in 1965-66 was 111,642,000 hectares compared with 97,321,000 hectares in 1950-51, an increase of 11,962,000 hectares, about 14 percent in fifteen years (3, p. 208).

Efforts continue by about 40,000 block level extension workers and 50,000 village level workers in 5,370 community development blocks covering 566,900 villages of India to develop the villages and improve conditions for

the millions that inhabit them.

2. Communication Needed

Despite all these efforts in guided social and technological change, results of the program leave much to be desired; and India has not been able to achieve a "breakthrough" in productivity or a "yield take-off" stage, not so much due to inherent defects in the programs as to lack of effective exploitation of total manpower and effective communication between technologists (those who know) and the farmers (those who need to know). Communicating in a manner so that technology of agriculture is received, understood, accepted and applied is needed.

CHAPTER III

COMMUNICATION--DEFINITION, ROLE AND EFFECT

Various authors have defined and discussed "communication." In a recent study, by Minter (34, pp. 26-36), of 12 definitions of communication current in literature, the following by Raesh and Bateson was accepted as the most complete by the National Society for the Study of Communication.

Communication does not refer to verbal, explicit and intentional transmission of message alone . . . The concept of communication would include all those processes by which people influence one another. . . . This definition is based upon the premise that all actions and events have communicative aspects, as soon as they are perceived by a human being; it implies, furthermore, that such a perception changes the information which an individual possesses and therefore influences him.

1. The Role of Communication

The role of communication in the development of agriculture in India is not only to inform and create an awareness among the farming publics but also to implant new ideas that change farming. The success of rural agricultural development depends on communicators to be sure that the transfer of useful ideas are from reliable sources and in tune with farmers' values, culture and other social factors. Understanding those factors continues to be an overriding challenge to extension educators. Useful ideas are useless until they are accepted or until they motivate those involved in the art and science of agricultural production to adopt and practice the ideas. Success lies in communicating the ideas and intended changes so that they are accepted and sustained. The extension worker, in the massive community development program for all purposes, also must be accepted. Therefore, he has a grave challenge and an exciting responsibility. The welfare of people,

and often their very lives, depend upon his skill in conceiving and executing effective agricultural development programs. His responsibility is balanced by tremendous opportunities to be of great service to the rural masses as they improve their social and economic status.

For agricultural development through extension education to be successful, therefore, it is not enough that an extension worker has good ideas. He must also know how to communicate them effectively. His success is determined by his ability to communicate ideas to others so that the knowledge, skill and attitudes are transferred. One has not taught if he has not communicated. He has not communicated if his ideas were not transferred.

2. Effect of Communication

Y. V. L. Rao (38, pp. 97-110) discussed the effect of communication in the development of economic, social and political spheres, the very objective of community development programs in India.

He feels that in the economic sphere:

(i) Communication helps a person find alternative ways of making a living. It is through communication that one gets to know the availability of different types of agricultural occupations. Once a farmer knows the various occupations and their pros and cons, he can make an appropriate decision. Lack of communication, on the other hand, results in stagnation of a man. No developing country can afford to have square pegs in round holes for that inefficiency wastes human energy and funds--not to mention the psychological stress and strain on the individual and on the community.

(ii) Communication helps reduce the pressure on land. Information helps people find alternative modes of activity and employment and thus

moves people into them. This reduces pressure on land--an extremely important prerequisite for industrialization and transition from traditionalism and an agrarian economy to modernization and urbanization.

(iii) Communication helps raise a family's economic status. When information about alternative income producing activities, like the spare time and cottage industries, is taken advantage of, farmers earn more, as do others associated with those industries. This increases family income and raises the economic status of both.

(iv) Communication creates demands for goods. As an isolated and self-sufficient community is pierced by communication flow from outside, desires are aroused. This increases the demands for new things. The demand need not necessarily be merely for consumer goods. It may include such capital investment products as fertilizer for a farm or a water lifting device for irrigation. In either case, communication aids development, for consumption must increase as production goes up and capital investment increases both consumption and production in the long run.

The innate desire to emulate others helps people learn of the good and bad of a new product. In case it is good, the incentive to obtain it may create a saving habit or stimulate higher earning capacity. This may result in circulation unlike the traditional saving habit of rural folks, which results in "dead capital."

(v) Communication motivates local initiative to meet rising demands and broadens the entrepreneurial base. Knowledge communicated is essential for both buyers and sellers, even when agricultural produce is taken to the market for sale. Communication enhances the bargaining capacity of the farmer and also lets him know the market trends so he can plan his production

and know consumers' needs and the market. It may also result in new combinations of agricultural enterprise being undertaken. In a growing or developing economy, such information is not only received but actively sought.

Communication may also enlarge the base of the entrepreneurial class where a few have monopolized trade or business. It may help other groups take advantage of growing opportunities for information about markets and methods of marketing no longer remain a monopoly. Information introduces healthy competition in the trade—a sign of economic development.

(vi) Communication helps economic development become a self-perpetuating process. Communication and economic agricultural development, by mutual help and growth, result in an overall self-perpetuating developing process. The constant interaction of communication and economic development lead to a steady growth.

In the social sphere,

(i) Communication aids in the process of status change from one of heredity to one of achievement. It is a common observation that a better informed person, be it a teacher or priest, is generally more respected in the traditional societies. When communication channels are opened, persons in lower socio-economic classes see opportunities to enter ranks of the "respected."

In India, unlike in its previous generations, caste and creed now have little meaning or importance in achieving change of status. It is no longer the birthright of a few families to rule. Communication creates an equal opportunity to all. Other qualifications being equal, there is no problem in the process of status change. Heredity will no longer be a barrier to achievement, and status positions are no longer the preserve of a fortunate

few, once communications channels are opened and functioning.

(ii) Communication motivates the illiterates to become literate. When the channels of communication are opened and information becomes a status-achieving tool, people are motivated to gain information and thus to make a conscientious effort to become literate. Such a situation may also make adult education more successful. To date it has not been very successful. There is a lack of trained personnel with understanding of rural people's needs to man adult education programs.

(iii) Communication helps shift the influence from age and traditional status to knowledge and ability. With new ideas and new information constantly being communicated to a community, traditional leaders will no longer be the fountainheads of knowledge. Instead, people will look for the "well informed" to lead.

The farmer who hears of better yields elsewhere would not rely on the knowledge of a village grand uncle who has always hitherto been considered an "expert" on farming. He would prefer to discuss the problem with the extension worker or any other better informed person. If someone, though younger, has been a successful innovator in the village, his help and guidance would be sought to increase production, because of his proven ability. Thus information, especially when it is backed by results that are conveyed through indigenous channels of communication, brings about a gradual change in influence patterns, and the closer such information is to the needs of the people and the more immediate relief it affords, the quicker the change is accepted.

(iv) Communication forces the traditional leaders to compete to retain status and motivates them to acquire knowledge and adopt changes. Generally,

no one likes to barter his higher social status and position in the rural communities, unless pressed by circumstances. Pressing circumstances will create a thirst for change and new knowledge so adjustment will result in enhanced efforts to obtain information because social status in a developing community will be earned by knowledge.

(v) Communication helps induce the parents in rural areas to send their children to schools. Though the caste system may be said to be dying in India, the traditional professions and occupations have not lost caste-profession pressures. Invariably, one can still find a barber's son being a barber and a washerman's son being a washerman and so on. It is only through communication that information about the alternative employment and income-producing activities can become known.

If compulsory primary education is to be successful, make an impact, and increase enrollment in village schools, parents must be informed about the more exciting experiences of others who have sacrificed some comforts to get their children educated. If enough convincing information is communicated to a large proportion of a community, efforts may even be made by the residents to build the necessary educational facilities in the village itself.

(vi) Communication helps people find new norms and achieve a balance during a period of rapid change. Any aspect of community or agricultural development programs in India will make a better impact and involve the community only if and when communication is used to explain "what is and what ought to be"; in other words, only when the gap between the two or the need is understood.

It is communication, again, that explains the changes and helps people

find new norms—some uprooting age-old, traditional beliefs and practices.

(vii) Communication helps bring about greater equality and a greater respect for human dignity. Status changes, with better communications and better information flow, make people more aware of situations and more respectful of the "well informed." Class, caste and creed become loosely knit. The individual, irrespective of the economic class he is born into, becomes aware that he too wields the new power of "a vote." The commandments then change into "requests" because now he is somebody who counts. He gains confidence in himself as a human being with potential for advancement. He is noticed in the slowly changing villages of India. For such changes to gain greater momentum, effective communication is needed.

Thus, communication is closely intertwined with social development.

As in the social field, communication also aids in improving political awareness. It helps develop better leadership, including needed changes in the power structure, motivates traditional leaders to defend their power by raising their own information levels; affords stimulus to the masses and helps them recognize their own importance in the power structure.

It also helps government officials to learn the needs of the people, aids program planning and keeps the public informed of the government plans and programs.

Last but not least, it is effective communication that helps a community or nation to achieve unity and better participation in all activities, so that the programs are no more government plans and peoples' participation, but a peoples' plan and peoples' participation with government aid.

In order to realize the various economic, social and political advantages of advancement of rural India, it is appropriate to discuss the

process of communication, elements involved, the critical factors a communicator needs to be aware of, and the channels of communication.

CHAPTER IV

COMMUNICATION--PROCESS, KEY ELEMENTS AND CRITICAL FACTORS

1. Process of Communication

A process is an act of proceeding; a series of actions or operations definitely leading to a desired end. Each episode of communication, according to Legans, has at least three phases: expression, interpretation and response. If the expression is not clear, the interpretation accurate and the response proper, one's effort to communicate will not succeed (30, p.366).

A classical statement of communication process, according to Wilbur Schramm is: "A communicates B through Channel C to D with effect E. Each letter is to some extent an unknown and the process can be solved for any one of them or any combinations" (44, p. 240).

In a continuing human relationship such as the program of agricultural development, successive cycles of communication have a cumulative meaning and effect and, thus, every human relationship is always in a state of change. It is constantly getting better or worse.

Communication involves understanding content. According to Coleman and Marsh, ". . . in a broadest meaning all educational and action programs in agriculture are communications" (15, pp. 93-101). If one is conducting a program designed to obtain the adoption of a new agricultural practice, the extent to which such adoption takes place is in large degree a measure of the success that those responsible for the program have had in communicating their ideas.

There can be no progress in any development program without communication. Some effective method of communication is necessary and is a primary

requisite for human interaction. People have to communicate not only to build but also to maintain any kind of social order. They must come in contact directly or indirectly and this contact must result in the transfer of meaning and mutual understanding.

2. Key Elements in Communication

In the discussion regarding the communication process, it was evident that to successfully communicate, we need:

- (i) a source--a skillful communicator(s) with a clear objective,
- (ii) a useful message,
- (iii) a proper channel,
- (iv) effective treatment,
- (v) an audience or receiver(s),
- (vi) response from the audience.

We shall discuss each of those six elements involved in the process of communication:

(i) Source(s) or the Communicator(s)

All communication must come from some source(s). This might be a person(s) or an institution(s). But it is a key element influencing the effectiveness of a communication process. The credibility of the source or the communicator as perceived by the audience is a powerful determinant in the process. The questions like who or what is the source? What motivations he or it has? What does he or it know about the subject? What are the attitudes and skills involved? And in some cases (of interpersonal communication) even such factors as personality of the communicator, his actions, speech and even his mannerisms, dress etc., may sometimes affect the

communication.

In a program of agricultural development and production, the communicator may be a village level worker, an extension officer or any other person of the extension agency; a friend or neighbor of the farmer; a salesman or an agency.

Legans (30, pp. 373-375) has listed the following as the qualities of a good communicator.

(A) A good communicator knows:

- (a) his objectives--has them specifically defined;
- (b) his audience--its needs, interests, abilities, predispositions;
- (c) his message--its content, validity, usefulness, importance;
- (d) channels that will reach the audience and the channels' influence;
- (e) how to organize and treat his message;
- (f) his professional abilities and limitations.

(B) A good communicator is interested in:

- (a) his audience and its welfare;
- (b) his message and how it can help people;
- (c) the results of communication and their evaluation;
- (d) the communication process;
- (e) the communication channels--their proper use and limitation;
- (f) how to improve his communication skills.

(C) A good communicator prepares:

- (a) a plan for communication;
- (b) communication materials and equipment;
- (c) a plan to evaluate results.

(D) A good communicator has skills in:

- (a) selecting messages;
- (b) treating messages;
- (c) expressing messages--verbal and written;
- (d) the selection and use of channels;
- (e) understanding his audience;
- (f) collecting evidence of his results.

Therefore, a good communicator should develop a high level of professional ability on those critical points.

(ii) Message

A message is the information a communicator wishes his audience to receive, understand, accept and act on. Messages in agriculture may consist of statements of scientific facts about a new or improved variety of seed, fertilizers, plant protection aids, irrigation and the like.

Messages are not precisely the same as the subject matter or technology conveyed. They are rather a generalized idea of what the subject matter says. Eg. "fertilizer, when used properly increases crop yield" or "by washing rice properly its food value is retained." Those statements represent messages a communicator may wish an audience to receive, accept and act upon. Subject matter of a message consists of facts that support or justify the message.

If after a communication, the receiver or the audience remarks, "so what?" or "I do not get the point" or "where do I go from here," it is evident that he did not get the message. The key objective of a communication therefore should be to transmit useful messages so that receivers understand the messages clearly.

A good message, therefore must be:

- (a) in line with objectives to be attained;
- (b) clear--understandable by the audience;
- (c) in line with mental, social, economic and physical capabilities of the audience;
- (d) significant--economically, socially or aesthetically to the needs, interests and values of the audience;
- (e) specific--no irrelevant material;
- (f) simply stated--covering only one point at a time;
- (g) accurate--scientifically sound, factual and current;
- (h) timely--especially when seasonal factors are important;
- (i) supported by factual material covering both sides of the argument;
- (j) appropriate to the channel selected;
- (k) appealing and attractive to the audience--having utility, and immediate use;
- (l) applicable--so that the audience or receivers can apply the recommendation;
- (m) adequate--combining principle and practice in effective proportions;
- (n) manageable--can be handled by the communicator with high professional skill and with the limits or limitations imposed by time or by other factors.

Legans says that, properly applied, the foregoing criteria for selecting and sending messages will contribute much to the goodness of the message. Effective communicators use them skillfully.

(iii) Channel

The other major element in communication is the channel. The source and the receiver or the communicator and the audience have to be connected

or tuned with each other. For that purpose, channels of communication are necessary. "Channel(s)" are defined as the physical bridges between the sender and the receiver, of the message(s). There are many ways we can look at the channels of communication. Perhaps the simplest is to list the five senses that can be used to receive a message. In other words, channels of communication are ways of presenting the message so that the message can be seen, heard, touched, smelled or tasted. Any one or a combination of the senses may be exploited as channels of communication.

Research by Hass and Ewing (23, p. 97) has shown that senses or channels communicate messages in the following percentages: Sight--87%, hearing--7%, smell--3.5%, touch--1.5% and taste--1.0%.

Channels of communication in an extension situation also include meetings of all kinds, radio, television, books, bulletins and small illustrated publications, circular letters, newspapers, organized tours and personal contacts. The list may be further expanded to include other visual and audio-visual aids and other extension methods that make it possible for a communicator to transmit his message to the intended audience.

Generally communication is more effective when more channels are used; i.e., when more senses are stimulated, directly and immediately.

It has been established that as the channel intensity and number goes up, potential audience size usually goes down. In other words, multiple channels with high intensity produce maximum effect on fewer persons. A single channel with low intensity produces minimum effect on much larger groups of people. However, there are many exceptions to that rule (6).*

* Anonymous, Communication Process, material distributed at AID Communication Seminar, Michigan State University, East Lansing, August, 1968.

Whatever the channel(s) may be, it has to be carefully selected and used in the right way, at the right time, to do a job for the right purpose with the right audience, all in relation to the right message. Any of them being inconsistent, the message will have no meaning and only create "Noise" or obstruct communication.

These are some of the factors that create "noise" and distort the message (30, pp. 378-381):

(a) Failure of a channel to reach the intended audience. Usually no one channel can reach all the audience. For example, meetings—all people may not hear; radio—all people do not listen when their radios are tuned to a station and, of course, some have no radio or do not have it turned on; written material to people who cannot read.

(b) Failure on the part of communicator to handle channels skillfully. If a meeting, tour or radio program or any other channel is not used as good procedures dictate, its potential for carrying a message is impaired and/or dissipated. For example, in a meeting everyone must be able to hear what is said and see what is shown; those who do not cannot receive the message.

(c) Failure to select channels appropriate to the objectives of a communicator. All channels are not equally useful in attaining a specific objective. For example, if the objectives were to show a certain group of people how to do something, a demonstration is a good channel of communication, much better than radio, circular letter or newspaper. On the other hand, if the objectives were to inform, give general information, or make them aware, then radio, circular letter, poster or newspaper would be the proper channel.

(d) Failure to use channels in accordance with the abilities of the

audience. Written materials are not useful to those who cannot read or to those unable to understand at the level of complexity or abstraction of some messages.

(e) Failure to avoid physical distractions. When using the channel of meetings, for example, distractions including people moving in and out, loud noises, uncomfortable lighting or improper seating arrangements often distract. Disturbance or static over the radio, poor writing, and unattractive exhibits are other examples of "noise" or distortion that lessens the effectiveness of communication channels.

(f) Failure of the audience to listen or look carefully. The only messages that get through to an audience are those that are heard, seen or experienced. An unfortunate tendency of people is to give only divided attention to a communicator. This may also obstruct a message from reaching the audience.

No single channel is good for all messages, all audiences and for all times. It is a combination of channels that produces the desired effect in a given situation and at a given time.

Legans (30, p. 380) indicates that up to five or six channels used in combination are often necessary to get a message through to a large audience with enough impact to influence significant changes in behavior.

(g) Use of too many channels in a series distorts the message. For example, if a block development officer, originates the messages to be communicated to a sizeable number of farmers, the series of channels could be as follows:

The block development officer communicates the message to the agricultural extension officer who in turn communicates it to the village level

worker who communicates it to the local farmers. The use of such a series of channels often distorts the message so it does not reach the intended audiences in the original form. The information undergoes a process of levelling, sharpening and assimilation from person to person.

Levelling is defined as shortening, sharpening as the selective perception, retention and reporting of a limited number of details from a larger content. Assimilation, refers to the way in which items in the message are sharpened, levelled or otherwise altered in accordance with the interests, attitudes, cultural themes, stereotypes, biases and beliefs of those handling the message. Assimilation can be roughly equivalent to distortion (33, pp. 275-276). Therefore when lines of communication are too long or numerous, they have to be improved either by using additional channels in parallel and/or eliminating some channels in the series.

(iv) Treatment of Message

Treatment has to do with the way a message is handled to get the information across to an audience. It relates to the expertness necessary, technique or details of procedures, or manner of performance essential in presenting messages.

A message, to be communicated, must be clear, understandable and realistic to the audience.

A communicator is a creator of learning situations who recognizes that only what an audience receives is communicated.

No single technique is suitable for all groups, occasions and subject matter; so one has to select and combine techniques or tools in a logical manner and evolve methods of communicating to get ideas across to the audience.

(v) The Audience (Receiver)

The audience is the receiver or consumer of a message. The "pay off" in communication depends on what the audience does in response to the messages.

A communicator first accepts an audience the way it is--as he finds it. He then has to proceed with attempts to move it towards his objective. Therefore an analysis of the culture of the audience and the existing situation is essential.

An audience in any communication situation may be classified as potential audience, available audience and active audience. However, individuals may belong to one or more groupings. At the primary level, however, there are only two audiences: (A) the one a communicator intends to reach--the intended audience and (B) the others in a geographical area--an unintended audience. In the intended audience there are usually (a) listeners or attenders who act on the message; (b) listeners or attenders who do not act; (c) nonlisteners or nonattenders. The communication cannot be successful to the extent desired, unless the intended audience cannot be properly divided in a descending order from (a) to (c). All grouping in (a) is the goal sought.

Audience participation is voluntary. Consequently, if a communicator, does not transmit useful messages (information), make their meanings clear, and persuade those in the audience to accept the information, they will neither act nor participate in the program. Communicators knowing that their messages are useful is only the beginning. The audience is the judge of a message's usefulness so they must be convinced.

(vi) Audience Response

Response or action is the final or end product of communication. It is the objective of a good communicator. When the other elements are properly selected and skillfully used, the audience response will be desired action. Hence, the resources used and the activities carried on (in the name of community development and extension education to increase agricultural production) are only the means to an end and not ends themselves. The ends sought are desirable actions resulting from educational and communicational activities.

After a message is received, audience response likely will vary, particularly when messages do not meet an emergency in the respondents' view. The different responses have various causes.

(a) Understanding versus knowledge. Knowledge of facts alone does not constitute understanding. Knowledge is only the first step. Understanding is attained only when one is able to attach meaning to facts, see relationship of facts to each other and to the whole proposition and the relationship of the total body of facts to the problem under consideration. Communicative effort often fails because it stops after simply laying facts before people and does not continue in a systematic way to promote an understanding of the facts presented. People usually do not act on facts alone, but only when an understanding of facts is gained. Communication must promote understanding.

(b) Acceptance versus rejection. A free, alert and thinking human mind requires that understanding precede acceptance of facts and propositions. In turn, it insists on mental acceptance before action. For it is what human beings come to believe, not what they merely know or even

understand, that determines what they do when they are free to act as they choose.

(c) Remembering versus forgetting. When opportunity for action is not immediately available or action is delayed, the factor of forgetting what was learned influences the kind and extent of action taken at any point of time. That basic principle has extensive implications for timing in communication programs. Transmitting the right message to the right people at the right time is crucial in successful communication.

(d) Mental versus physical action. Changes in the mind of man always precede changes in his actions. Man's mind controls his overt behavior. Consequently, a message suggesting physical action could receive full cooperation and understanding except for the final decision to act. That kind of "cooperation" is sometimes referred to as "lip service."

(e) Right versus wrong. The intent of communication is to promote desirable action by an audience as determined by the communicator and expressed in his actions. Consequently, resulting action in line with intended objectives is assumed to be "right" action. But the problem is more complex. Unfortunately, "noise" often plays a disturbing role at this point. For a variety of reasons people often fail to behave precisely according to instructions, even when they understand and accept them. Assume, for example, that a message giving five steps in seed-treatment has been transmitted to a group of cultivators. Assume further that the cultivators understood, accepted and acted on the message. But the results were disastrous, as they well might be if the cultivators, contrary to the instructions, decided among themselves that if one ounce of chemical in treating a maund of grain (as instructed) was good, two ounces would be

better. Individually and in groups, human beings have their own ideas about how to act (30, pp. 387-389).

In addition to the above, audience response is also influenced by many other factors like the receiver's skill and his ability to read, listen, understand and think. If one of those is limited, the whole process of communication is limited.

The closer the match in communication skills between the source and the receiver, the more effective the communication will be.

3. Critical Factors in Communication

Successful communication in programs of rural and/or agricultural development requires a series of acts planned in effective sequence to become socially and culturally integrated.

Communication starts with recognition of needs, that new ideas can help, and proceeds until people have acted on them. Communicators, must skillfully combine the unit acts into an integrated whole. Only when that is done can communicators influence large numbers of farmers to change their behavior, adopt improved techniques, and increase agricultural production substantially.

Questions and comments from the audience and their observations may help in assessing whether one has really communicated. Such interaction or feed back between communicators and the audience is necessary at each step in the adoption or acceptance process, to insure success.

The critical factors in communication may be broadly classified as social and cultural.

(i) Social Factors

Communication is an essential prerequisite for increasing agricultural production and is basically a human activity. Farmers are members of a society and social systems, as are all human beings.

To make communication more effective and to be able to predict communication behavior of the audience, it is necessary that we have a basic understanding of the social organization or structure and such social institutions as the family, groups and cliques, social norms, positions of individuals, their roles, conflicts and other social factors. Such social factors vary from group to group and area to area.

In India, farmers do not live apart from others nor independent of their influence. They are members of many social groups or systems—consciously or unconsciously. It is evident, therefore, that farmers can make few decisions without regard for others.

Messages concerning agricultural production are not received in a vacuum. Ryan and Gross (43) have indicated that the social context in which the receiver finds himself is a determining factor in exposure, evaluation and action.

Social or cultural influence is seen by observing that:

- (a) Farmers who are members of certain groups respond differently to messages than farmers who are not group members.
- (b) Farmers in the same group react differently to the same message at different times.
- (c) Group membership may prevent or deter exposure to a message.
- (d) Farmers who are members of groups with norms favorable to the message are more likely to respond favorably than those who are

members of groups with other norms.

(e) Response will vary with the importance a group attaches to a message.

(f) Overt response is related to the accessibility of appropriate social mechanisms to express suggested plans of action.

Farmers also are members of locality groups like neighborhoods and communities. Family and its members as a group wield influence in the decision making process.

Social cliques are groups composed of a small number who accept each other as a social equal and associate as close friends, largely excluding others and often placing high values on each other's opinion in matters quite unrelated to agriculture.

There are also people to whom farmers in India always go for advice and help in making judgments. These reference groups may be informal in structure but they play important roles in acceptance or rejection of messages.

Formal groups like the village panchayat, panchayat samithi, zilla parishad or any other similar group that elects officers, appoints committees and functions with a formal plan of action can wield enough influence to get a message accepted or rejected quickly. They are composed of individuals who have social status and get things done.

Caste groups, age groups, professional groups, economic groups, status groups and others all contribute to the process of message acceptance or rejection.

A communication, to be accepted, must be in tune with the social norms, positions and roles of individuals in a group and with groups in a society.

Norm is implied to be accepted and correct behavior. Position in this sense is a set of behaviors required to achieve objectives and goals. Role is behavior expected of persons in particular positions in a given set of circumstances.

Violating the existing norms or no consideration shown towards the various positions and roles may automatically eliminate any consideration of a person's message by the audience. Communication should therefore be planned in congruence with the norms prevalent to make the change effective.

A knowledge of the composition, attitude and functioning of the various groups greatly helps a communicator plan messages for favorable reactions. An understanding of the conflict of roles and of social and informal channels of communication will greatly aid in executing effective communications.

(ii) Cultural Factors

The normative aspect of human society and human behavior enhances both value and sanctions. Values are the goals or principles in terms of which specific norms are claimed to be desirable. Sanctions are normative aspects that include inner and outer compulsions.

Culture provides the rules that define roles of persons in various relationships, alone or in groups. Culture both derives form and lends form to social life.

Lundberg et al. say that the cumulative production of interhuman learning is "culture." So culture is the social heritage of a given society that marks its distinctive way of life. They define culture as "a system of socially acquired and transmitted standards of judgment, belief and conduct as well as symbolic and material products of the resulting conventional patterns of behavior" (33, pp. 171-172).

Culture has three components:

First is the action system, which includes customs, folkways, and a variety of other performance patterns. Second is the normative system which specifies how people are supposed to act and spells out their duties, responsibilities, rights and privileges. Third is the system of symbolic and material products that result from human interaction; the products are organized into intricate complexes such as libraries, communication networks, and industrial plants or agricultural developments that have an important influence on the mode of life. The culture of any given society may be described and analyzed in terms of those components.

Culture, therefore, may be viewed as an organization of ideas, principles and rules. Obviously anyone ignoring the cultural patterns of an agricultural community will be tolerated at best. More likely, he and any communication from him will be rejected rather than accepted.

(iii) Cultural Patterns

There are variations in every culture, but each has patterns that can and need to be detected. A person remaining in one culture often will not notice culture patterns.

It is, however, important to recognize cultural patterns as we go from one culture to another. Each social group, even within one culture, has certain kinds of unconscious habit and thought patterns. If a communicator hopes to carry new ideas into new groups, unconscious habit patterns may interfere.

Various speakers at the Communication Seminar of the Agency for International Development at Michigan State University (1968) suggested the following to make communication effective and acceptable:

(a) Base any change on needs. People do not vary customary behavior unless they recognize needs that existing ways do not satisfy. What is important is to base the program on the felt and recognized needs of people who are to be affected by changes. Often that requires considerable work with people to help them identify their problems, objectives and goals and to stimulate them with the possibilities for improvement.

(b) Provide for participation. While a specific culture may limit the kinds of participation possible, people involved should take part in planning, determining methods, action and in evaluation.

(c) Identify with social organization or structure. Any culture has established channels of communication and cooperation, representing generations of effort. Through social organization, we find ways to communicate, work together, and mobilize resources.

(d) Recognize varying degrees and rates of change. What may seem a simple change to an innovator often is perceived as a radical change by a person who has no opportunity to travel far, much less to other lands. Moreover people differ in both willingness and ability to grasp and apply new concepts or practices.

(e) Avoid resistance to manner of introduction. Often, the resistance to a new idea(s) may be traced to peoples' dislike of the person or organization presenting it or the way in which it is presented. Resistance that continues over a period of time may form antagonistic groups. Attention to the four preceding points helps avoid the pitfall of resistance to the introduction.

(f) Avoid cultural bias. In agricultural development, communicators, to be more effective in communicating, must understand the culture of

farmers, their ways of thinking and doing and reasons they relate to their actions.

4. Communication and Attitude Change

An attitude is simply an inclination to respond in a given way to a given issue or situation. Opinion is an expression of an attitude on a controversial topic. It implies controversy and dispute. Fact implies general acceptance (16, p. 71).

Wiebe (16, p. 70) thinks, "Opinions adapt attitudes to the demands of social situations; but having adapted them, opinions appear to become ingredients in the constant, gradual reformulation of attitudes."

So, attitudes of individuals provide raw materials from which a consensus develops. Attitudes affect (i) ways we develop messages to be communicated and (ii) the way we evaluate and respond to communications received from others.

Influencing an individual's attitude is the prime task of a communicator. Consequently he must know the source of a person's attitudes and the attitudes' social and cultural backgrounds, as reflected in the person's value system before attempting to change an attitude.

There are two schools of thought on what determines a man's attitude. One is that man is irrational, with limited powers of reason and thus susceptible to emotional appeals. The second is that man is rational with strong powers of reason and discrimination.

A good communicator, recognizing emotions, relies on the second school of thought, that powers of reason in a man may be appealed to and brought into play by two-way communication of information that changes opinions

permanently.

Experience and observation confirm the ideas presented by various speakers at the Communication Seminar, Michigan State University (1968) that people tend to organize their beliefs, attitudes and resulting behavior in ways logical and consistent to them. Any situation where a person feels that his beliefs, attitudes and behavior are inconsistent or out of balance produces tension. Man tries to overcome tension and restore balance (6). For example, farmers who believe that fertilizers are harmful to soil and deplete soil nutrients find it uncomfortable to accept as fact the idea that "fertilizers increase crop yields."

Some will not accept the idea and will not use fertilizers, at least for a time. Other farmers may use much less fertilizer than recommended and seek satisfaction with the idea that they used too little to deplete soil nutrients. Others seek balance by seeking more information, probably going to other farmers who are better informed or an agricultural extension agency or a research station and then acting on the basis of the information they get.

To deal with the first two groups and the potent force of their attitudes is a challenge to communicators. The communicator must study each situation, individuals and groups to find the source of their opinions. That requires almost endless exploration of heredity, environment, motivations, and past experience, particularly of members of the first two groups, because people act on the basis of pictures in their minds rather than in accordance with reality.

To understand those with "negative attitudes," as we may call members of the first two groups, we must get to the roots of the pictures in their

mind.

Harwood Childs (16, p. 74) classifies factors that shape a person's attitudes into two categories, primary and secondary. Primary factors are the things we read, hear or see, ". . . the channels of communication and what comes through them--the ideas, reports, news, representations that constitute our world of verbal symbols." The secondary factors are those of environment--where we live, how we live, how old are we, how prosperous are we, our social and psychological heritage, etc. Primary factors are active; the secondary are latent.

In most attempts to enumerate and classify primary and secondary factors, heredity or environment is a common starting point. Environmental factors of culture, family, religion, schools, social and economic groups interact with active and direct influence with what people see, hear or read. As Cutlip and Center (16, p. 81) put it, "Environmental factors provide the glasses through which we see and interpret."

Change in attitudes may be brought about by:

- (i) effective programs of community development and social welfare
- (ii) positive efforts of extension services and personnel
- (iii) salesmen and social organizations
- (iv) religious leaders of various faiths
- (v) efficient communication, including mass media.

However, communicators have to keep in mind the continuing interaction of all the forces and factors for, "Man is a creature of culture, yet creates his culture. Attitudes shape opinions--expressed opinions, in turn, reformulate attitudes. The family influences the child, who, in turn, influences the family. Group norms guide the behavior of group's members, yet the

members determine the norms" (16, pp. 83-84). Mass communications, through mass media's content and emphasis of messages, build and change opinions. On the other hand, opinions have a great role in changing the content or emphasis or both in messages. A host of variables, interacting on one another with varying effects as time passes, make or break attitudes.

For agricultural development in India, attitude changes are needed among farmers, extension workers, administrators and others who are directly or indirectly involved. Such changes can be achieved more by direct than by indirect contact.

CHAPTER V

DIFFUSION AND MASS COMMUNICATIONS IN AGRICULTURAL DEVELOPMENT

Inventions and new ideas arise from on-going activities of man. They may occur without planning and/or incidental to other activities; or they may occur as the result of consciously directed efforts of agricultural and other research institutions. The invention and development of new ideas by agricultural research scientists are of little use, unless the information is communicated or diffused to farm people.

Linton (31, p. 324) defines diffusion as "a transfer of culture elements from one society to another." An invention that has been achieved and socially accepted at one place can be transmitted by diffusion to other cultures.

1. Diffusion Process

The diffusion process involves spread of any new cultural elements, factors responsible for the spread, reactions evoked by the new element in different societies, and adaptations that acceptance of new traits into various cultures entails.

There are three important principles of diffusion (31, pp. 332-336):

(i) Time and contact. Other things being equal, elements of culture will be taken up first by societies close to the elements' points of origin and later by societies remote or with less direct contact.

(ii) Marginal survival. A new appliance, or an improved method in agricultural development spreads to neighboring societies with time and content. At the same time it may very well be undergoing change and

improvement at the point of origin. Such improvements, in turn, will be diffused to neighboring societies.

(iii) Functionally related. While elements of culture may be diffused alone, they are more likely to travel in groups of functionally related elements.

Diffusion occurs through three phases (31, p. 336):

- (i) Presentation of the new cultural element(s) to the society.
- (ii) Acceptance (or rejection) by the society, and if accepted,
- (iii) Integration of the accepted element(s) into the preexisting culture.

Each phase is influenced by many factors. Presentation of a new element presupposes contact, and contact can be through various media. According to Barnett (7, p. 7), diffusion is acceptance and acceptance is diffusion, the one being conventionally appropriate to the description of a collective response to a new idea, the other to an individual reaction. Psychologically he observes no difference between the two.

A new farm practice arising from an existing practice often is accepted because of its relative advantage over and slight change from the existing or old practice. Simply comparing output per unit of input may show improved efficiency and result in acceptance of an innovation.

Communication and diffusion are facilitated by understanding the process of adoption, types of adopters, and sources of information that come into play.

2. How Farmers Accept New Ideas

The United States Department of Agriculture has been working at this

longer than other governmental units in other countries. The USDA learned that getting new ideas accepted is not the simple process of discovering a new or improved practice and publicizing it. The ideas must be accepted by farmers.

Lionberger (32, pp. 3-4) summarized the research dealing with acceptance of technological change in agriculture and concluded that acceptance of innovations goes through five stages:

(i) Awareness. An individual learns of the existence of an idea or practice but has little knowledge of it.

(ii) Interest. The individual develops interest in the idea. He seeks more information and considers its general merits.

(iii) Evaluation. The individual makes mental application of the idea, and weighs its merits for his situation. He seeks more information and considers trying it.

(iv) Trial. The individual actually applies the idea or practice, usually on a small scale.

(v) Adoption. If the idea proves acceptable, it is adopted.

Those five stages are not necessarily a rigid pattern people follow. They are not a set of exclusive and discrete categories with no overlap. Rather, they represent five sequences that can be clearly identified very frequently.

But that is not all that is involved in getting a technological change accepted. An individual will accept an innovation more rapidly when he sees it as congruous or consonant with previous favorably evaluated practices than when he fails to see it as congruent with a previously evaluated practice. Brandner and Kearn (10, pp. 288-303) found that individuals use

previously adopted practice to evaluate subsequent innovations and will adopt the subsequent innovations much more rapidly when they see the new as like the old. For example, good results with hybrid corn led to rapid acceptance of hybrid grain sorghum, even before the latter was dependable. Good results with one chemical on a crop will lead to rapid acceptance of other chemicals. Good results with one ration additive will lead to rapid acceptance of another additive.

Brandner (9) hypothesized that congruence also could be a strong negative influence that might retard rather than accelerate change. That is, if a person had poor results with hybrid corn, he might be one of the last to try hybrid grain sorghum. The same would be true of chemicals on crops or ration additives. That being possible makes it doubly important that results are good from acceptance of a first innovation in our programs for change. Good results with first innovations accepted would accelerate acceptance of subsequent innovations but poor results might retard or prevent acceptance of subsequent innovations.

3. Sources of Information at Various Stages of Adoption

Evidence shows that farmers use different sources of information at various stages in this process of adoption of new practices. The information sources used at each stage in the process represents only one type of many influences operating in changes considered and made by individuals.

It was also concluded that the information about new farm and home practices are communicated by these agencies in order of appearance:

- (i) Mass media--radio, television, newspapers, magazines, films.
- (ii) Agricultural agencies--extension agents, vocational agricultural

teachers, etc.

(iii) Friends and neighbors--mostly other farmers.

(iv) Dealers and salesmen--purveyors of commercial products and equipment.

Media, or agencies, and persons have varying impacts at each stage of the process. The mass media have their greatest impact and usefulness in creating awareness. For farmers and farm wives, at least the mass media become less and less influential as the acceptance process advances towards adoption. In the interest stage, mass media still play an important part. But, to learn more, the farmer turns to agricultural agencies and friends. In the evaluation stage, friends and neighbors play the dominant role. In the trial stage, agricultural agencies, friends and neighbors all are important. Dealers and salesmen are influential in the interest stage when commercial products are involved. The time span of each stage varies (32, pp. 21-31).

Research conclusions demonstrate that communicating a new idea or practice is a long, tedious task. Different media are effective at different points and in different ways. The influence of the innovator or influential leader is great in some communities. It is important for the communicator to know what media and techniques to use at different stages and how to mobilize the various influences effectively. Effective communication is expensive in time, in understanding, and in emotional control. The cost is higher than is commonly supposed (16, p. 153).

4. Farmers' Categories in Relation to Agricultural Information Sources

It is a common observation that farmers adopt new ideas or practices at

different times, not all at the same time. The factor of time is expressed in terms of years between first knowing about the practice and adopting it. The farmers can be classified according to the time taken by them to adopt.

A committee of rural sociologists (48) indicated that farmers can be classified into four categories, viz., innovators, community adoption leaders, local adoption leaders and later adopters, according to the sequence in which they adopt new practices. A fifth class is that of non-adopters, who do not adopt the practice at all.

Rogers (40) classified farmers into five categories according to the relative time at which they adopt a new practice, essentially as in the preceding paragraph. He called them innovators, early adopters, early majority, late majority and laggards or nonadopters.

5. Mass Communications and Their Present Status

An understanding of the mass communication process will improve dissemination of information and thereby accelerate agricultural development, when mass communications in the form of mass media are employed.

"Mass communication," according to Lundberg et al. (33, p. 449), "refers to the relatively simultaneous exposure of a large scattered and heterogeneous audience to stimuli transmitted by impersonal means from an organized source for whom the audience members are largely synonymous." Mass communications among villages in India, for the most part, remain to be developed.

The modern practice of communication takes into account relay and reinforcement roles played by individuals, which Cutlip and Center say, mean less reliance on mass publicity and more on reaching thought

leaders (16, pp. 148-149) who may be very well compared to innovators in agricultural development.

Roper (41) also emphasizes using opinion leaders to get messages accepted.

Laswell (29, pp. 178-190) says, that in measuring the efficiency of communication in a given situation, it is necessary to consider the value at stake and the identity of the group whose position is being examined. In democratic societies, as with Indian farmers, reasonable choices depend on enlightenment, which in turn depends on communication, especially among leaders (opinion and action leaders), experts (in agriculture and communication) and those being lead (the farmers and others engaged in agricultural development).

Sapir (43, pp. 162-166) classifies three main techniques that can facilitate communication. He feels that we can:

(a) Create a new type of symbolism by which messages are paraphrased to convey only the main meaning.

(b) Transfer language into writing, coding and other types of pictures, or into an expressive symbolic process, which he calls direct transfer.

(c) Create more effective physical conditions by using radio, television and the printed word in addition to improving railways, telephones and allied means of communicating. Because the place of the printed word in Indian agriculture is limited by low literacy of the agricultural population, we must use more pictorial representations than words.

(i) Newspapers and Publications

According to a report of the Registrar of Newspapers, Government of India (4, p. 2), newspapers and periodicals have increased by 701 and

about 200,000 in circulation during 1967. Taking into account periodical publications numbering 2,363, the total number of newspapers and periodicals in 1967 was 11,678 compared with 10,977 in 1966, an increase of 7.8 per cent. Between 1962 and 1966 a 25.9 per cent increase was registered.

The Indian Press in 1967 consisted of 646 dailies, 2,697 weeklies and 5,972 other periodicals. Hindi has the most newspapers (2,207), followed by English (1,958), Urdu (864), Bengali (595), Tamil (403), Telugu (314), Kannada (229), Malayalam (310), Punjabi (188), Assamese (23), Sanskrit (31), Oriya (86), Sindhi (63); bilingual (691), multilingual (168) and other languages (99).

The most newspapers (1,452) were published in Maharashtra, followed by Uttar Pradesh (1,406), West Bengal (1,050) and Delhi (1,016).

But few newspapers carry any stories or articles regarding agriculture. The reason often given is low literacy among villagers. But literate people in urban and rural areas must become aware of potentials for agricultural development. Food is scarce for the vast majority, and improved practices in agriculture can improve the lot of all citizens. Also pictorial stories ^{increasing} could be of interest and could have a great effect on agricultural production.

In a country with high illiteracy, use of the printed word, from necessity, will be limited. But the literate section of villages cannot be ignored. In opinion formation and in dissemination of ideas, the literates have a vital role. Useful literature for them is not being produced in adequate quantities. The situation in regard to the neo-literates is worse. In actual practice anything printed on coarse paper and in big type passes as material suitable for rural readers. Periodicals produced

especially for villages, if any, contain more news on politics than information relevant to development programs. Pamphlets and books tend to be very heavy and pedantic in style and language and they are not suitable for rural readers. Publications must be a pleasure to read; not a challenge.

(ii) Radio

Radio seems to offer the most potential at present. It could be used effectively to reach farm populations in extensive areas. There are already 200,000 community listening sets in the villages of India. But only 5.6 per cent of total broadcast time is used for rural development programs, including agriculture (3, p. 125). That is pathetic in view of India's crucial food problem. Despite its almost ignoring village people, radio has been, at least indirectly, a powerful source of information to them. Innovative use of this medium is beginning to show some impressive results. Programs aimed at rural audiences, in the past and even today, are generally dull and statistics ridden but they have a happier aspect also. Some stations of the All India Radio have given personality to their programs by building them around a central character who can arouse and maintain interest by adopting the folk idiom and by interpreting the more pedantic and dull information to the rural masses through language suitable to the audience.

Radio Farm Forums, i.e., organized listening groups of agriculturists, are also a useful innovation. It has been found that the message conveyed by radio penetrates deeper when it is followed by discussions between village people and some of their opinion leaders after the broadcast. Two-way communication between the broadcasting station and the village people also stimulates interest.

Data from research in Indian villages by Kivlin et al. (27, p. 56)

encourage use of Radio Farm Forums. Nearly all innovations studied were adopted faster in villages exposed to the radio forums than in control villages or villages exposed to literacy classes.

In radio, as with other media, choice of idiom, themes and manner of presentation are crucial. Production of inexpensive, trouble-free receiving sets also must precede wide use of this medium. The government must consider subsidizing the cost of radio sets and transistors for use by farmers in rural areas.

(iii) Television

Television, inaugurated in 1959, has not yet been extended far in India. By reaching the eye and the ear simultaneously, it has great potential for communicating messages to the mass agricultural population. But to do so, it must go beyond the borders of the Indian capital, Delhi, into villages where the farmers live and produce India's food.

The recent decision of the Government of India to permit the production of 10,000 television sets a year at Kanpur and 30,000 a year at Pilani in Rajasthan (5, p. 6) to begin by 1969 is laudable. But unless TV stations are set up to produce and telecast suitable programs for farmers, the receiving sets will not be purchased or used by the vast majority, and they may retard rather than accelerate food production. With food more desperately needed, television programs aimed at increasing food production would be wise use of scarce funds. If used solely as an entertainment medium, television would be difficult to justify at the present time.

(iv) Films or Motion Pictures

The popular image of films or motion pictures in rural minds is that:

(a) they provide entertainment and (b) they have a corrupting and deruralizing influence. Only limited use has been made of this medium to teach detailed practices; their principal use so far has been to build certain images and to convey information regarding specific programs and innovations. Most of the films have an urban bias. When they seek to entertain as well as to educate, the emphasis on entertainment is so great that the educational part frequently is ineffective. Or, alternatively the instructional element is so heavy and drab that the film bores village people. Choice of themes, mode of treatment, and use of language and symbols too often are not those of village audiences.

(v) Film Strips

The use of film strips has been nominal rather than widespread. This medium could be used to illustrate processes, but costs and lack of trained personnel to produce the strips has precluded wide use of them.

A country, especially like India, which is trying to extend its educational opportunities rapidly and where the number of expert teachers, authorities and communicators is limited, must make better use of mass media. The initial cost of mass media, especially radio and television, seems high. But once the cost of production is covered, they can be used with many classes and groups and as many times as desired by the help of audio and video tapes.

(vi) Traditional Folkways and Folklore

Besides sophisticated communication media, traditional communications media provide considerable scope for innovation in India. In their conventional form, the media are used primarily to entertain or to recreate the

mythological and historical past. But the traditional media have been successfully geared in some parts of India to the requirements of developmental communication. Folk form of communication for entertainment and education, like drama and "Burrakatha" in Andhra Pradesh, Katha Kalakshepam in the south (especially in Madras), and Kavigan in Bengal have been adapted to disseminating information. Here the setting and the principal characters are familiar to the audience. The actors know the rural mind and have a firm grasp of their idiom. In the hands of talented and resourceful actors, the treatment of development themes, either as a main or an incidental attraction can be really forceful. Interpolations in the form of Bol (words spoken at regular intervals) during the Bhangra dance in the Punjab, and in the form of dialogue during the singing in Laoni and Powada in Maharashtra, have been successfully used to convey development messages. Puppet shows also have been effectively used in some parts of India.

What is needed is to find suitable persons in the present generation who can be effective in agricultural development. They exist but need to be found, encouraged, and suitably rewarded.

CHAPTER VI

AGRICULTURAL COMMUNICATION CENTERS--A SUGGESTED ORGANIZATION

The new, emerging agricultural universities in India are among the most promising potential source of leadership for spreading agricultural development, as well as helping to build cultural and social resources in rural areas of the nation.

However, they can be a tremendous short and long-range force only if effective communication supplements research, resident teaching, and extension efforts and becomes an integral part of the Universities' structure and a total university commitment.

Now, results of much agricultural research are largely unused, lying dormant in scores of laboratories and experiment stations. Only a trickle of this useful knowledge is disseminated to those who can use it. Instead of that situation, all who might use it should have the knowledge. They include scientists, extension workers, and other professional personnel, literate and illiterate farmers and representatives of industries allied with agriculture. Communities must prevent such wasted opportunities, manpower, ingenuity, funds and facilities.

A dearth of well-trained communicators, knowledgeable in agricultural sciences exists and no agricultural university in India is teaching young men at both undergraduate and graduate levels to fill the void. In-service training in agricultural communications for professional personnel also should be tied into an academic program at the university level.

The third need in this trinity is communication research applied at first to practical, operational problems in agriculture so that a "target

audience" can be reached with assurance and confidence, rather than trusting to intuition or hunch. Agricultural communication should, like any other field of serious study, have a research base. A research program could strengthen both the academic and informational service functions at a university. No new agricultural university has yet established such a concept of agricultural communication research, academic instruction, in-service training and extension. Such a strong unit dedicated to serve the needs of agricultural development would pay tremendous dividends on the investment. Fortunately agricultural universities are taking over the research responsibilities in agriculture and allied areas; each should recognize the importance of research in communications, so results of all other research can be applied to India's problems, particularly in food production--and to acceptance of other new ideas by Indian villagers.

1. Communication Training Greatly Needed

A well developed university will have to incorporate into its academic program a complete curriculum in communication arts. Adequately trained communication specialists will be needed for the important job of taking knowledge to where it can be applied, which will be cropping up in the near future.

As Wilbur Schramm stated (45):

Essential to operation of the mass media is skilled personnel. A developing country will therefore need training programs for professional and technical staff in all media.

Development of mass media calls for full use of research to determine the relative effectiveness of the various mass media and the differing needs of the audiences. Such information is essential if the media are to be employed efficiently in

easing the process of social change and maintaining close contact between the media and their audience which themselves change rapidly in a developing society.

2. Objectives, Functions, and Responsibilities of the Communication Centers

The major objectives, functions and responsibilities of the communication centers would be to assist the agricultural universities become alive and vibrant and to fulfill their basic purpose as a "Land-grant type institution." That can be achieved by:

(a) Developing a strong Agricultural Communication Service, staffed by able communicators to interpret results of research and to disseminate such useful information through various mass media to farmers and others (agri-business organization, government officials, politicians, processors and distributors and those interested in agricultural development) who need the results.

(b) Working with agricultural scientists to get their research published in popular form.

(c) Conducting communication research to help agricultural information communication programs function better, and gradually become a chief source (custodian and disseminator) of agricultural communication research knowledge.

(d) Offering at first a basic academic program in agricultural communication at the undergraduate level to help find and train young men in this new profession in India and then move into graduate programs, thereby providing a source of competent personnel for other such organizations, government ministries and other agriculturally related industries and businesses.

(e) Organizing in-service training courses for agricultural extension and information workers at state, district and block levels in cooperation

with the State Development Departments, Ministry of Food and Agriculture, Government of India and other interested parties.

(f) Maintaining good public relations with representative organizations of various mass media, to create a favorable and receptive attitude toward materials produced and distributed by the agricultural communication services of the agricultural universities.

(g) Maintaining good relations with cooperating groups, including civic, social, and farm organizations, and government agencies to gain support and acceptance of agricultural universities and of the Agricultural Communication Centers.

(h) Providing results of research, including their own in communications, to administrators, decision makers, commercial media and others.

3. Organization and Administration

Organization

Heckmann and Humeryager (24, p. 53) define organization as, "a social group in which members are differentiated as to their responsibilities for the task of achieving a common goal."

The concept of organization, therefore, implies differentiation of responsibility and indicates relationships between members who are coordinating their efforts to achieve a common goal.

Administration

Walters (52, p. 3) defines administration as "a process of planning, organizing, managing, appraising and controlling an enterprise." It involves the thinking and doing, from plans to profits to accomplishing a purpose.

Simon (47, pp. 1, 2) defines it as, "the art of 'getting things done.'" Emphasis is on processes and methods to insure incisive action.

Newman (36, p. 4) expands the definition as the analysis of what the administrator does in terms of the following basic administrative processes:

(a) Planning--that is determining what shall be done. As used here, planning covers a wide range of decisions, including clarifying objectives, establishing policies, mapping programs and campaigns, determining specific methods and procedures, and fixing day-to-day schedules.

(b) Organizing--grouping activities necessary to carry plans into administrative units, and defining relationships among executives and workers in such units.

(c) Assembling resources--obtaining executive personnel, capital, facilities and other things needed to execute the plans.

(d) Directing--issuing instructions, including the vital matter of indicating plans to those who are responsible for carrying them out, between the "boss" and his subordinates.

(e) Controlling--seeing that operating results match, as nearly as possible, the plans. That involves establishing standards, motivating people to achieve the standards, comparing actual results against standards and taking necessary corrective actions when performance deviates from plan.

Gullick et al. (22, p. 13) adds the staffing, reporting and budgeting to the administrative process.

(a) Staffing--the function of bringing in and training the staff and maintaining favorable conditions of work.

(b) Reporting--is keeping those responsible to the executive informed as to what is going on, which includes himself and his subordinates--through

records, research and inspection.

(c) Budgeting--includes all fiscal planning, accounting and control.

Clark (19, p. 24) adds evaluation and relationships to the administrative process.

(d) Evaluation--is continuous appraising of the progress made in achieving goals and objectives.

(e) Relationships--he stated, is relating and communicating policies, objectives and aspirations of the organizations, internally and externally.

(i) Principles of Organization and Administration

McCamy (17) enunciated the following six principles of organization and administration.

(a) Definite and clearcut responsibilities be assigned to each executive.

(b) Responsibility be coupled with authority.

(c) No person occupying a single position be subjected to orders from more than one person.

(d) Reasonable staff service be provided to executives.

(e) No administrator have reporting to him more subordinates than he can supervise adequately.

(f) Main subdivisions that are alike be put together keeping in view local needs and conveniences.

(ii) Key Factors

Newman (36, p. 132) says that in the organizing process there are certain key factors that should be considered in arriving at a sound and workable arrangement of activities. They are:

- (a) Take advantage of specialization.
- (b) Facilitate control.
- (c) Aid in coordination.
- (d) Secure adequate attention.
- (e) Recognize local conditions.
- (f) Reduce expenses.

A few guideposts

Kearl and Read (28, p. 24) have indicated a few guideposts that resulted from a conference of agricultural administrators and editors of U.S. Land-grant Colleges and Universities, to reappraise the role of agricultural information work as a part of agricultural education in the United States. The guideposts are modified here to suit conditions in Indian universities.

(a) The head of the agricultural communication center would be responsible to the Vice-chancellor or the President of the University.

(b) All sectional heads in the Communication Center would be responsible to the Head of the Communication Center, staff members to the sectional heads.

(c) Agricultural Communication/information work would be coordinated with other institutional or agency subdivisions by the head of the Center.

(d) The Head of the Communication Center would of necessity participate in all the development programs and policies of the university, to be aware of communication possibilities emanating from them.

(e) The Communication Center would be composed largely of specialists assigned to a particular job. They also would teach courses, and conduct research in their fields of study and activity.

(f) A Publications Council, one each for research and extension

publications, to be certain that information to be published was valid. The Councils would also decide financial problems beyond the administrative control of the Agricultural Communication Center which might come up from time to time. The publications council might be abandoned once the communications centers were well established, and academic discipline heads automatically were responsible for the validity of information from their departments.

(iii) Qualifications of Personnel

Thomas (19, pp. 161-167) and Chapman (13, pp. 23-33) have discussed the qualifications of personnel required for the various positions in similar organizations.

The following attributes, in general, are desirable:

- (a) A college degree in agriculture, home economics or allied fields.
- (b) A college degree in journalism or other communication arts.
- (c) Competence and practical experience in mass media and rural or farm background and administrative ability.
- (d) Cooperativeness, congeniality, liking people and the ability to establish good relationships with groups and individuals inside and outside the Communication Center, in general.

4. Organization Proposed

With the concepts, principles, key factors and guideposts previously recorded, an organization is proposed, as shown in Appendices I to III.

The proposed arrangement indicates the position of a Communication Center in the agricultural university including research and extension publication councils. Appendix II indicates the proposed sections of the

Communication Center. Appendix III shows relationships of the Communication Center to various disciplines of the agricultural university and to outside agencies.

There is nothing sacred about any such organization or arrangement proposed. The suggested set-up is intended to be helpful only to those planning information or communication centers in agricultural universities. Those making such plans will, of course, establish their own versions of the basic communication organization. They could add or delete positions or alter the set-up to suit their own needs and conditions. However, work of the Communication Centers will expand greatly as research and extension work increases and the expanded situation will call for staff additions, until the communication centers are fully organized. Future growth then will be primarily adding more staff members in each category to handle the increasing volume of work.

5. What to Write About and Publish^{*}

Generally faculty and staff members engaged in research and extension work of an institution like an agricultural university are expected to produce material for the public as a part of their jobs. Faculty members who cannot produce such material may reasonably be assumed to be accomplishing little. After three years of such nonproductivity, it may be assumed with some degree of validity that the individual's efforts should be examined critically by his superiors.

Every new project, program or a scheme or completed research project on

^{*} Much of the material for this has been adapted from the references 12, 20, 25, 37, 49, and 50.

which a researcher has been engaged for a year or more will have some interesting and reportable results. To have reportable results, it is not always necessary that researchers produce positive results, or announce a new or exciting discovery. Even if results are negative, they serve as a basis for a news story. Much early research in United States land-grant universities produced data showing that what was thought to be true (as fruit trees on the plains) was not true. In that sense results of research may produce more negative than positive results, but such negative findings aid programs by showing that a popular practice has no scientific backing. Reliable research data not published serve no useful purpose. Besides, a research worker using public funds has the moral obligation to release promptly significant results of his research efforts.

Likewise, extension workers and extension education specialists should be in positions to produce both original publications and adaptations, a reasonable volume of timely and current publications, press articles and mass media releases. Farm and home demonstrations, farm days, field trips, seminars, short courses, workshops and in-service training camps or classes and such activities provide ample opportunity for reporting through the mass media and using the information produced as bases for educational materials for farmers in the form of simple, lucid, visual, interesting and understandable messages in various appropriate forms.

(i) Publications--A Classification

Possible publications that could be brought out by the communication centers of the agricultural universities include the following:

Research bulletins

Research bulletins could form a series in every area and aspect of

agriculture, animal husbandry and home economics. They are relatively technical, detailed, scientific and professional. They present highest levels of scientific writing and should meet highest requirements for research reporting by the university. Generally speaking, research bulletins contain new data, and new analysis or new conclusions. They should establish conclusions beyond doubt or questions. They should follow approved scientific journal language and style. Such reports are generally much longer than is suitable for journal articles and contain complex and technical data. Distribution of research bulletins generally is limited to other researchers or professional people familiar with the vocabulary of research and technical communication.

Material from research bulletins often should be popularized in extension-type outlets.

Research journal papers

Research workers frequently have occasion to report results of their studies to fellow scientists and other interested persons. A good way to do that is to prepare an article for publication in a professional or scientific journal. Examples include the Indian Journal of Agricultural Science, the Indian Journal of Horticulture and others like those. Journal articles are well suited to reporting and recording results, techniques and scientific application of research. Manuscript length and content depend upon the policies and requirements of the particular journal for which the article is written.

Popular articles

Popular magazine articles provide excellent opportunities for distributing information. Any topic of importance or interest to the readers is

suitable for popular articles. The primary purpose of such articles is to present results of farm and home research and to offer suggestions for their practical application. Material for such publications needs to be presented in easily readable form. Suitable illustrations help make the message understandable. The authors should emphasize results, conclusions, recommendations and facts of interest and use to readers. The articles written could be largely used for agricultural magazines and even could be reproduced in congruent geographical areas.

Special papers

Staff members often have an opportunity to appear as participants on programs at professional meetings, seminars, field days, workshops, and other similar functions. Papers prepared for such occasions may also contain information for publications as either popular articles, nonuniversity periodical articles, press releases, radio talks, leaflets, pamphlets or circulars. The university staff should consider every opportunity to publish their materials as a contribution to the educational and research programs of the university.

Periodic reports

Agricultural universities require various departments and individuals under their jurisdiction to report periodically on their work. The reports provide evidence to governing and financing agencies and the public that funds used were invested wisely. More important, yet often ignored even in developed countries, the reports are a gold mine of information for communication experts. Since most of those reading the reports will not be scientists or educators (especially the annual reports), it is very important that the material be presented as graphically as possible. The

language should be simple, concise and clear. Above all, it should be based on facts and should avoid giving a false picture of accomplishments or of activities and programs under way. False propaganda has a way of boomeranging and of causing more harm than good. The best public relations always is doing a good job and then telling about it in a way that is understood and appreciated.

Programs, projects and activities completed one year should not be reviewed and retained in the next year's report. An annual report deals with what has happened in one year.

Special publications

All institutions occasionally need to publish reports and other materials that do not fit into the classifications described. A good example would be a report compiling information of particular significance to a group of individuals who may be influential supporters of the institution. Such reports are essentially special-purpose publications, intended primarily for audiences with specialized needs or interests. Other examples of such audiences might be community level extension workers, vocational agriculture or home science teachers, conservation technicians, farm leaders or special interest groups in business or industry. Materials issued in the interest of public relations, histories and promotional brochures might also be described as special reports.

Popular bulletins

Popular bulletins can also cover every aspect of agriculture, animal husbandry, home science and related fields, as do research bulletins. But popular bulletins must be written for common men, not for scientists. Such bulletins present material that has practical application, that supports

efforts to improve agriculture and to increase agricultural production, to increase use of agricultural products to improve techniques. Extension personnel often can help write such bulletins in collaboration with research workers, or alone, and have research workers check the extension version for accuracy only. They may prepare original manuscripts based on demonstrations or thoroughly tested research. The language of such publications needs to be simple, easily understood and relatively nontechnical. Good graphic illustrations help them communicate.

Brochures are usually fancy, cost more to produce, and are therefore selectively distributed.

Pamphlets, leaflets, folders and handbills

Pamphlet is two or more sheets folded or not and printed on one or both sides, stitched or pasted together or not, containing a number of steps or recommendations on a problem. Preferably they have covers.

Leaflet is a single sheet of paper, generally printed on both sides and folded to make a four-page piece of printed matter containing accurate and specific instructions on how to do a job.

Folder is a single sheet of paper generally printed on both sides with two or more folds conveying an idea or giving instructions on doing a job. Leaflets are more economical to produce and easier to read than are folders.

Handbill is a loose printed sheet announcing some information of immediate importance, written in a brief, simple and lucid style to be distributed by hand.

Pamphlets, leaflets, folders and handbills should publish facts and results in a form carefully and concisely written and to the point. Illustrations or photographs may use much of the space. Subject matter of such

publications is usually limited to one problem or sometimes one aspect of a problem.

Posters and wall newspapers

Posters are important visual aids used for specific jobs. They are single paged, bold lettered, colored and often have an attractive picture.

Wall newspapers are similar in size and appearance to posters. They are different in that wall newspapers usually attempt to communicate more than one fact or idea, so they have more illustrations and written material.

Posters and wall newspapers serve essentially the same purpose. They are usually displayed publicly, on walls or other places of heavy traffic.

Circular letters

One of the best communicating devices is a circular letter on a particular subject to an audience of like interests. Such circular letters must be brief, simple, informal and have a personal touch. Such information can be inexpensively sent only to persons interested. Mass media attempt to use information and entertainment that pleases the highest percentage of people. Circular letters deal with subjects their selected audience is interested in. They may deal only with poultry and go only to poultry producers, with only greenhouses and go only to operators of greenhouses, etc.

Charts, flip books and flash cards

Charts are graphic representations of facts and data on one or more subjects to help in group education.

A flip book is a series of large photographs or drawings on pages of at least 11" x 16" printed on one side and stitched at the edge. They also may be produced in bold letters (steps in a process, for example). A flip book usually hangs on a rod so that the speaker may flip pages as he completes

his remarks about the page.

Flash cards are cards of at least 11" x 14" with photographs or drawings presented in a series, one at a time. They are a good teaching device for quick understanding of a problem presented by a skilled speaker.

Agricultural calendars

Agricultural calendars easily could be published in regional languages, with recommendations from agricultural universities for each region. Each page could call farmers' attention to tasks that need to be done during that particular month to improve farming. Such timely reminders are chief advantages of calendars. They can be used for campaigns or for general agricultural information.

Agricultural magazines

The agricultural magazine, which could be issued once a month from agricultural universities, can effectively communicate agricultural progress, programs, and projects, if all authors know the magazine's audience. Literacy rate of India will determine when it is appropriate for universities to inaugurate agricultural magazines. They should be in regional languages and use simple and lucid style. To insure proper use and encourage continued readership, nominal subscription fees may be used. Such a project should be on a nonprofit basis. Costs might be offset by accepting advertisements of agri-business firms. However, the editorial board should be absolutely free of any pressure from advertisers. Often a magazine, like other university communication media, is ethically bound to report research that shows advertised products as worthless or nearly so, so it is preferable for university publications to be subsidized as education and to avoid accepting advertisements from commercial concerns.

Possible topics for an agricultural magazine include editorials, feature articles, forecast of events, letters from farmers telling their experiences, questions and answers, the man of the month (who increased agricultural production), news of the month, improved agricultural practices, what is new in agriculture, review of agricultural publications, and other related topics like market forecast and weather forecasts.

The entire publication must be in popular form to cater to the needs of the farmers; and the language and idiom should be that of the farmers. Accepting public funds in their salaries obligates scientists to communicate to the public, so no honoraria should be offered.

News letters

News letters with practical scientific, agricultural information are most effective when regularly issued every month free to all university extension workers and district staff.

Mass media news releases

News should be issued regularly to local newspapers, radio stations, and other commercial news media. Special efforts must be made by communication centers to show newspapers how important food production is in the lives of their subscribers so space will be given to agricultural topics. Special care should be taken to see that simple language is used. Successful experiences of farmers may be used as materials to present "recommendations" in highly acceptable form.

In preparing material for release to the newspapers, nonuniversity periodical articles, or the All India Radio, staff members of the university should work closely with the staff in the universities' agricultural communication centers. Materials for the press or radio may be advance notices,

current activity, or follow-up types. The communication centers may at times specially solicit materials from research workers and extension education specialists.

(ii) Procedure for Publication

(a) The head of the Communication Center, who is also the secretary of the Publication Council (one each for research and extension publications) will issue a letter each year to all the heads of departments of all colleges in the agricultural university requesting material for publications.

(b) Authors of various publications will prepare manuscripts.

(c) The concerned publication council will review publication for authenticity of the material presented in the manuscript, including the illustrations. The financial outlay will come from the Communication Center's budget.

(d) The Communication Center will duly edit the publication in consultation with the author.

(e) Galley proofs will be corrected by the author.

(f) Once final galley proofs are approved, a pasteup or dummy of the publication is completed by the editorial staff of the Communication Center and sent to press for printing.

(iii) Pretesting

Pretesting of publications with extension workers and villagers is necessary. It is the responsibility of the Communication Center to do this important task before the publication is put out on a large scale. However, the extension specialists could be of great help in this work, as they go to the villages quite often.

(iv) Distribution

Bringing out various publications is only the beginning. The only valid reason for publications of any kind is to communicate information, so all, including visual aids, must be distributed. The staff of the Communication Center must see that the published materials reach intended readers at the right time. To do that precisely and effectively, Distribution Center must have sufficient staff, including at least one or two technical assistants, two dispatching clerks and one class IV attendant with adequate furniture to sort and store the publications.

A specific distribution list for direct mailing to all the Heads of the Development Departments, District Officials, Block Development Officers, Extension Officers (of each of the concerned subjects), Youth Clubs, Mahila Mandals and Gram Panchayat libraries (where they exist), various Gram Panchayats and such other interested organizations should be compiled and maintained on an up-to-date basis by the Communication Center.

Arrangements should also be made for bulk shipments to District Officers and Block Development Officers. They are in the best position to pass single copies onto the village workers and appropriate literate cultivators.

It is important that the Head of the Communication Center or his deputy periodically visit outlying offices to see that the publications are being distributed properly and used. Such inspections provide an opportunity for evaluation by the Communication Center regarding how the publications are being received. Extension specialists also will be a source of evaluation as they continuously visit the villages.

If the publications are sold, necessary arrangements should also be

made for their regular and proper sale. United States offices are beginning to offer selected ones for sale after providing them free for about 50 years.

6. Research in Communication--Problems and Challenges

Agriculture has two main functions: providing food, feed, and fiber; and providing industrial raw materials. Under the present circumstances, the production of the three F's is the critical need in India.

Talk that food production should be immediately raised by all means is neither new nor novel. It has been, and continues to be, the exhortation of political leaders, recommendations of economists, advice of the extension workers and administrators, demand of consumers, and desire of farmers. However, it is quicker said than achieved. Rapid change, or for that matter change itself, does not appear to be that easy, as Wilkening (53, p. 16) pointed out:

(i) Forces to maintain existing behaviors are stronger and more pervasive than those for change. Stability and security are just as essential to the well being of individuals and groups as are flexibility and change. Every change carries with it at least a tremor of cultural shock.

(ii) Change in techniques and methods of production, marketing etc. nearly always change relationships with others and norms that are valued. So change of individual patterns require changes in a group's norms and actions. The extent to which an individual is prone to make changes without reference to other groups or to a higher authority needs to be determined for each type of change and for each type of social situation.

(iii) Behavior patterns of people are developed over long periods, usually a lifetime, hence are not changed easily or quickly. Change in

behavior requires time, time for an individual to see the need for new solutions to his problems, to learn about the solutions, and to adjust them emotionally and physically through thought patterns so he can perform them without fear of failure or ridicule and without losing the security that old norms provided.

(iv) Promotion change through an institutional structure requires that activities are organized into an occupational role that is both effective and attractive.

The results of our efforts rest not only on understanding the factors that affect change in agricultural patterns but also on the ability of agents of change to learn to organize knowledge into a role that satisfies the change agents as well as the farmers the agents work with.

Since communication about new ideas tends to follow existing patterns of interaction, it is essential to understand the interaction patterns and the extent to which agricultural development is a part of the interaction patterns.

It is also important to know the direction of communication in interacting groups. Interaction patterns will help define

- (i) who seeks information from whom about what matters and
- (ii) who is looked to for opinion on courses of action.

The principle of linkage pertains to whom and how persons in one group relate with other groups and agencies. To what extent do opinion and action leaders, village teachers, priests and peddlers or community businessmen perform the function of approving and passing on new ideas? All play parts, consciously or unconsciously, so their understanding and cooperation (or lack of resistance) can be important to increased

agricultural production.

Farming in India has been, and for the most part continues to be, a traditional pursuit. But it is not yet considered to be a satisfactory position.

As Wilkening (53, p. 16) said, "Our primary problem is that of how the organization and manipulation of words and symbols affect agricultural development, marketing methods and management practices." Answers to these questions require knowledge of techniques of communication as a whole and the elements involved in the process of communication: the Source(s), Message(s), Channel(s) and Receiver(s) in particular.

Needed are adequate conceptualization of the role of communications in technological change, a more adequate definition of specific research problems, and development of more reliable and precise techniques of collecting data, and of measuring and analyzing the variables used.

Since effective communication is an interdisciplinary problem, collaboration in defining, conceptualizing, and devising techniques is needed among sociologists, psychologists, anthropologists, and political scientists. Collaboration for joint application of their disciplines also is essential.

Research, the key to modernizing farming and the very foundation of advancement, has to be initiated and pursued to get valid answers to the various challenges of a communicator.

(1) Research on Human Factors in Communication Also Needed

Human factors involved in effective communication in agricultural development include:

(i) The farmer himself. Farmers are the center of all efforts to increase food production. They are the ones who are to be reached, their

interests are the ones to be stimulated, and it is they who are to be educated regarding better farming methods and provided with inputs to raise agricultural production.

Education and communication for change, or for that matter change itself, in any socio-economic system should anticipate correlated resistance.

Programs of rural reconstruction, education and communication that are inconsistent with basic attitudes, beliefs and cultural values of people will be met with rejection rather than acceptance. For that reason detailed knowledge of socio-economic conditions, family systems, power structures in the villages, beliefs and value systems in villages, personality characteristics and problems, needs, desires and existing skills (profiles of farmers) can help show planners and communicators how to avoid resistances. Such profiles are also necessary to personality problems of dissonance and of intergroup and intragroup conflicts that otherwise should be expected from disequilibriums induced by technological changes in rural communities in India.

That we have not constructed a profile of the Indian farmer and his problems may at least partially explain why our development programs have not accelerated up to now. Such research should be given top priority by the Government of India and her universities as well as by foundations and other governments and agencies that are cooperating with India in her efforts to become self sufficient.

(ii) Basic factors. Basic to agricultural production are inputs. The knowledge of farmers regarding soil, water, seed, manures, plant protection measures and other similar inputs and their interrelationships is far less than desirable.

That means that farmers should be equipped with knowledge of better farming techniques or the technical know how necessary. Only when they realize that there are alternative methods to increase production and when they acquire the skills necessary to apply such knowledge to their own situation will farmers be able to increase production on a sustained basis.

The challenge is to demonstrate (communicate) the improvements convincingly under local conditions, in local language and idiom so they will understand and want to use the improvements demonstrated.

(iii) Facilitating factors. Another set of factors indirectly influence farming efficiency. They include the supply of external physical resources, organization of technical services required, availability of cheap and timely credit, dependable marketing facilities, proved research information and efficient educational service which not only translates complicated technical knowledge into useful, simple agricultural practices, but also continuously strives to secure answers to the new problems of farmers.

Questions regarding facilitating factors that need to be honestly answered affirmatively are: Is the farmer getting adequate supplies, services and credit? Does he get reasonable prices for what his farm produces? Are storage or warehousing facilities and transportation arranged? Does he have a dependable source of knowledge that he can put to use on his farm? Is the communication he is getting capable of helping him with the needs he gives high priority?

(iv) Too much work for field functionaries. It is common knowledge that agricultural extension work in India today is but one facet of the multi-purpose educational approach of community development programs.

Agricultural development cannot go far without coordinated development in rural life, yet extension workers are overloaded with noneducational work items unrelated to developmental activities. That situation makes it difficult for extension workers to do much or any "Extension" and "Education" work. Agriculture unfortunately has "top priority" only on paper.

A challenge, therefore, is to find ways to help field functionaries devote more attention to educational work. Communicating materials and methods could help them influence more people and spread more knowledge more efficiently.

(v) Better services. Another problem affecting the progress of extension education work is related to supplies and services. As increasing numbers of farmers become aware of improved and approved methods of farming and accept or adopt them, the demand for extra help, advice and guidance will increase. Trained persons are not available, so native Indians should be made aware of their potential for such service and should be trained to provide it.

(vi) Unwieldy charge. There is another important challenge often met by extension workers and administrators. A development block or a panchayat samithi consists of about 70,000 people. Each one of the 10 (average number in each block) village level workers or gram sevak will normally have 7,000 people or about 1,200 farming families to serve. Even if a gram sevak were to maintain contact with only half that many families, he would be in more or less continuous touch with 600 families. He also has extension officers and supervisors (perhaps 6 or 7) to whom he is answerable; consequently he has little time, limited freedom of operation, and unwieldy responsibility--to state it mildly. Change agents in rural U.S. have a

ratio of about 1 to 12 farm families, if one considers those in the Soil Conservation Service, Rural Electrification Associations, Farmers Home Administration, County Extension Agents, Vocational Agriculture Teachers and others.

In addition, Indian extension workers must deal with a mass of non-literate and a few semi-literate farmers, who for various reasons, including bad and unfavorable past experiences in certain cases and their marginal existence, are much less inclined to accept and try innovations than are farmers in most other countries.

Obviously, a communicator in India will have to meet the challenges of enormous tasks with limited means at his disposal, and without research in communications at the local level.

Hovland (53, p. 18) has indicated four types of communication problems:

- (a) those that pertain to the communicator,
- (b) those that pertain to the message or the content of the communications,
- (c) those that pertain to the target of communications and
- (d) the interrelationships among the first three.

Communicators in India have a surplus of all four of those types of problems.

It is apparent that research is needed in developing countries like India on:

- (i) Availability and characteristics of different agents or channels of communication; i.e., the mass media, formal groups and agencies;
- (ii) The role of outside sources with respect to:
 - (a) The extent to which the messages draw attention, inform,

support and prescribe action,

(b) the degree of generality and specificity of messages,

(c) the topic or topics, i.e., the enterprise, the technique, credit, markets, etc.

(iii) Characteristics of people that might affect their receptivity to communications, such as:

(a) demographic,

(b) interests and aspirations,

(c) level of knowledge and sophistication,

(d) predisposition toward change, other attitudes and values relevant to receiving information.

Studies in communications also need to be related to other social processes. Improvement of agriculture in most countries depends on educational, political and welfare policies. How people obtain information in these areas should be included in communication research. Communication research is, therefore, needed for effective education. Improvements in education are needed if agriculture is to improve greatly in most rural areas.

Nations farthest behind in agricultural production need to make their biggest budget sacrifices for education, if they are to develop sustained food production and raw materials for industry.

7. A Proposal for In-service Training in Communication

(i) The Need

The need for training in communicating to others and use of communication materials and methods extends to all professional people in programs as well as volunteers who seek opportunities to improve village conditions.

Change in a democracy must be viewed and understood to be both a social and an economic process.

Since India's people have long been suffering and are now awakening to the fact that they no longer need to live in deprivation, it is both logical and necessary that the tried and proved methods of bringing about change be communicated in getting village people to change from their traditional ways of thinking, of living and of making a living. Dissatisfaction with the old (or awakening to the new) predisposes people to accept change.

There is no question that the ideas and extension programs of both government and the agricultural universities in the social and economic fields are characterized by their magnitude, their objectives of radical and rapid transformation and their sense of urgency. All need to be communicated to rural audience and farmers. It is necessary, therefore, that in-service training of personnel be planned and executed to meet the needs of change agents and to orient them toward the needs of farmers and villages.

Douglas Ensminger (18, p. 65) presented an overview of the situation and need:

Standards for professional proficiency are constantly rising in all fields of endeavor. Professional skill and know-how found adequate last year in the field of rural development will not be adequate this year. The trend is likely to continue. It is an intricate and complex educational task to design and execute . . . programs that significantly change the action of large numbers of rural people. This process challenges the artistry of the greatest leaders in rural development.

Education is the central force in effective extension work for rural development. That is so because the mark made on people by such a program is measured not by what is done for them but by what the program causes them to do for themselves. For effective extension educational leadership for community development, a gap must exist between what professionals know and can do and what the followers know and can do. That is the primary condition from which all professional leadership ultimately derives its usefulness and sanction.

Therefore, in-service training will further educate those already in service and can achieve change in their knowledge, skills and attitudes regarding the concept and use of communication processes.

The fundamental purpose of any training program should be to teach and train people how to think, not what to think. It is the function of extension agents and community leaders, to determine accurately their own needs and solutions of their problems. But communication training will help them overcome communication deadlocks.

(ii) The Problems

Rural and urban sectors still coexist in almost all states of India as separate entities. Physical isolation has led to dissimilar values.

In their rush for achievements, through development plans, extension personnel in India, frequently forget to clearly and emphatically explain to rural dwellers how important (absolutely) rural people are in fulfilling the hopes of the country. Nevertheless rural people's understanding of their importance is indispensable to motivate them. It is necessary for India to develop rewards (besides crop competitions and Krishi Pandit awards) that demonstrate that farmers truly are important. The rewards can be recognition in public and by mass media. Sustained markets, of course, must furnish financial rewards also.

Government and/or university extension agencies face various and complex problems. They encounter much lack of understanding about the importance of their work, just as the importance of food production is not understood well.

In addition to dialects and various languages prevalent, the language of extension personnel often is somewhat strange to rural people, more for the conceptual content than for the words used. That results from extension

agents using language they acquired in nonrural settings, and it often causes a communication break-down.

As Amaya (1, p. 48) put it: In spite of our efforts to understand their (rural people's)* language, most of us fail to penetrate more than the surface of the culture of the rural world. One must live in a culture to master a language and the same is true for understanding rural language.

In spite of everything, over and over again, we come up against the absolute loss of our messages, against ignorance or resistance, wrong or slanted interpretation, misinformation of communication by persons who have gone to the same "compasino" but who consciously or unconsciously misinterpret the message.

Also it is common to come across individuals and groups in villages of India who for some reason have foregone conclusions about programs and activities of the government and/or agricultural universities, and interpret the projects as a new assault against their good faith and inferior condition.

Such opposition, which may be imperceptible or visible, is strong because it always has the advantage of having village selected leaders propagate it and give prominence to it.

In-service training of extension personnel in the vocabulary, idiom and language of rural people (and in use of communication materials and methods) would go a long way toward correcting such situations.

(iii) What Is Proposed?

A comprehensive survey of communication problems of extension personnel

* Words in brackets are author's.

should be undertaken, to have a better and fuller grasp of the situation and of communication problems. Based on the findings, in-service training program of about four weeks could be arranged at the university campuses, during slack seasons in the year, in a phased program to cover all the personnel in batches of not more than thirty each.

It is suggested that the training cover communication processes, social and cultural factors in communication, interpersonal communication, salient features of news or feature writing, role of mass communications and mass media, audio-visual aids, community structure and functions, effective listening, principles of teaching, educational objectives and how to evaluate teaching, program planning, group mechanics and dynamics, photography and related topics; operating and maintaining equipment, radio rural forums and topics suggested by those who attend.

8. Proposed Courses in Communication Arts

For successful implementation of programs of communication to aid agricultural development, personnel trained in communication arts are desperately needed. Wilbur Schramm (46, pp. 217-218, 220) rightly pointed this out when he wrote:

"Trained persons are needed in a great variety of communication fields: information and development field officers, news personnel, program and production personnel, editors for book and periodical publications, teachers of mass media and information service personnel, broadcast and film engineers, printers, maintenance personnel, and others. The need is almost as universal in developing countries as the need for capital, and the supply of trained persons usually runs far behind the provision of communication

channels.

Ultimately any nation wants to train its own communication personnel, although it may still want to send some of its promising people abroad for experience. But it may be a long time before many developing countries have a sufficient training institutions such as schools of journalism, professional courses or institutes for film and broadcast training, professional training for publishing, technical schools for broadcast and film engineers and technicians, a school for printing, and perhaps a center for advanced training and research in mass communications.

Increasingly in the economically well developed countries, training has come to be conducted in schools of journalism. This is based on the belief that the essence of an enlightened profession is to have educated, ethically responsible men in it. Therefore, if the most essential craft (training in reporting, editing and the like) can be combined with a broad course of college or university study, and this experience set in the perspective of the history of human communications, freedom of speech and of the press, and the ethics and responsibilities of the communication profession, a truly professional education is obtained. In most schools of journalism, the technical and professional work takes up 25 per cent or less of the total curriculum. Sometimes the technical training is scattered throughout four years of college education; sometimes it comes as a graduate year following four years of broad college study, sometimes during third and fourth years only. In any case, the major part of a student's time is devoted to history, science, sociology, economics, literature and other subjects that will help him to write with understanding of the world he lives in.

We have been discussing mostly journalism training, because that aspect

of communication training is more highly developed than others. However, it is only one of several important fields of training that developing countries need if they are to train communication specialists."

It is fervently hoped that courses in communication will be added in agricultural universities. Better communicators would result for they also would have professional training in agriculture, animal husbandry or home economics coupled with training in communication arts. Graduates of such a school would be eminently qualified for information service jobs not only in agricultural universities but as agricultural information officers in all government services, as newspaper and radio reporters and editors, and as information and public-relations officers for every type of agribusiness, agriindustry or government agency.

Courses proposed to be offered

As an initial and maiden attempt, the following courses would be offered to the third and fourth year students in the Agriculture, Veterinary Medicine or Home Economics bachelors degree programs. Language requirements in India are completed at the pre-university stage, before students enter professional colleges.

This is only a proposed list of courses to be offered in collaboration with the only department of journalism, established recently at Osmania University, which is situated at another campus about 25 miles from the campus of the Andhra Pradesh Agricultural University. Courses will be added or deleted, depending on what Osmania University offers.

Other agricultural universities may introduce suitable courses depending on facilities available.

Communication Theory--3 credit hours; to be offered in two trimesters.

Introduction to the basic theories of communication, communication process, elements of communication.

Audio-visual Aids in Communication--2 credit hours; to be offered in two trimesters. Principles and techniques in the use of visual and audio-visual materials; operation and maintenance of equipment and sources of supply.

Reporting--2 trimesters; two credit hours. Covering news style and how to use existing mass media.

Agricultural Journalism--3 credit hours; three trimesters. Survey of agricultural information techniques with emphasis on principles of news and feature writing for the agricultural columns.

Editing--3 credit hours; two trimesters. Theory and principles with arrangements made with local newspapers for practical work.

Communication Lectures--1 credit hour; all three trimesters. Weekly addresses by practicing communication workers, radio, newspaper and television men (when it becomes feasible within the state).

Magazine Article Writing--2 credit hours; to be offered in two trimesters. Study of technical, trade and general publications, writing for general magazines, agricultural (assuming they appear) and business publications, and women's magazines.

Introduction to Mass Communication--3 credit hours; one semester. The social organization and change as influenced by the control, structure and functions of mass communications.

Public Relations--3 credit hours; to be offered in two trimesters. Media, methods, principles and practices of public relations.

9. Library

Besides the main library of the agricultural university, it is proposed to set up a small library of communication reference books and materials. The books suggested are listed in Appendix IV.

10. Equipment Needs

Equipment needs proposed are shown in Appendix V and the list of firms that could possibly supply the equipment is given in Appendix VI.

11. Housing

A suggested plan indicating space requirements is given in Appendix VII.

12. Finances

Approximate budget needed is submitted in Appendix VIII.

CHAPTER VII

CONCLUSIONS

Communication is essential to all human activity. One's ability to influence others is closely linked with his ability to communicate useful ideas. Of all the influence man is subjected to, the influence of ideas is probably the most important. Preparing and distributing messages of agricultural development and production to the millions of Indian farmers and villagers in ways that they are received, understood, accepted and applied, therefore is the greatest challenge to all extension workers in the Community Development Program in India.

For a rapid revolution in agriculture in India, therefore,

(i) Communicating agricultural information to farmers is a necessity.

(ii) Agricultural communication is not an educational extra but a way to interpret and diffuse agricultural research to farmers and others interested in agricultural development in a manner that it is accepted and acted on.

(iii) Communication to farmers has to be in line with their social and cultural patterns and needs. That requires an understanding of their ways of thinking and doing and reasons for both.

(iv) To gain better knowledge and insights into agricultural information needs and problems, research in communication is a must.

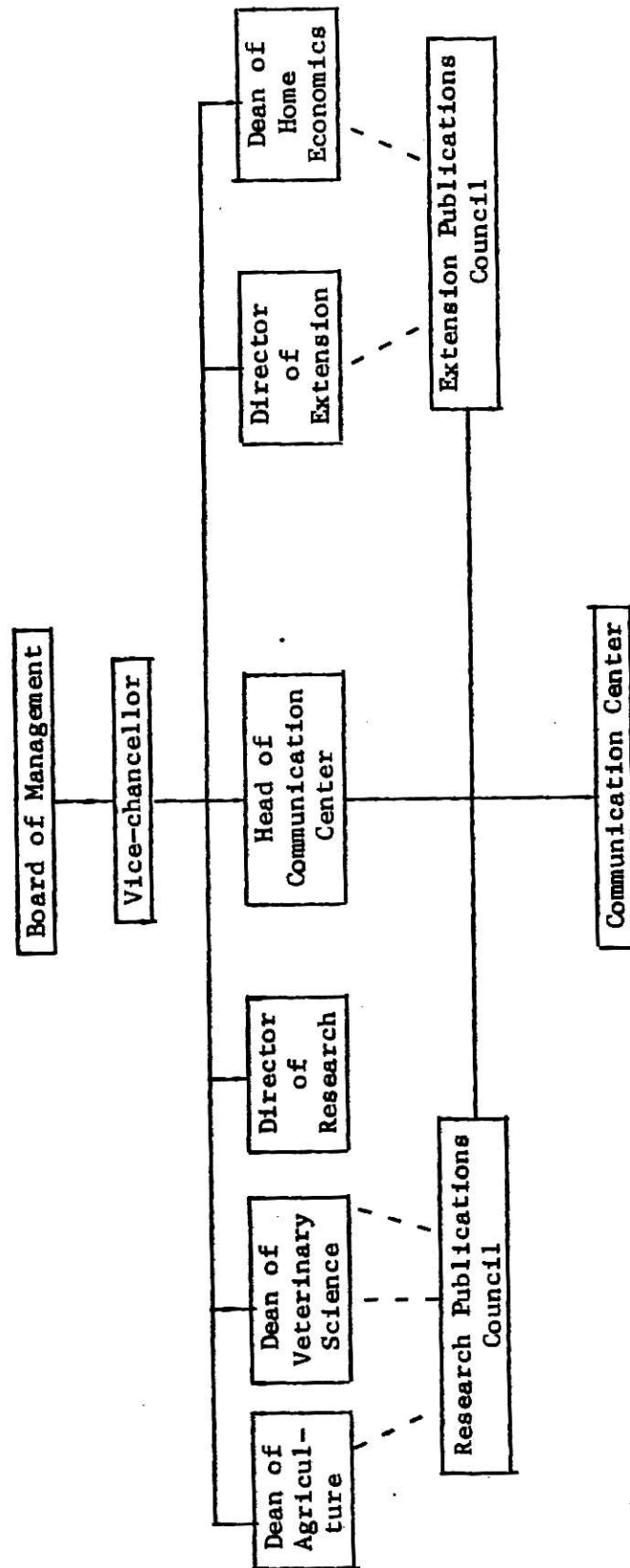
(v) Lack of trained personnel is a drawback. In-service training to existing men and women and offering courses in communication arts in agricultural universities would alleviate the problem.

(vi) Agricultural communication centers should be established, to cater

to the needs of this neglected input all over the country and particularly in agricultural universities.

APPENDICES

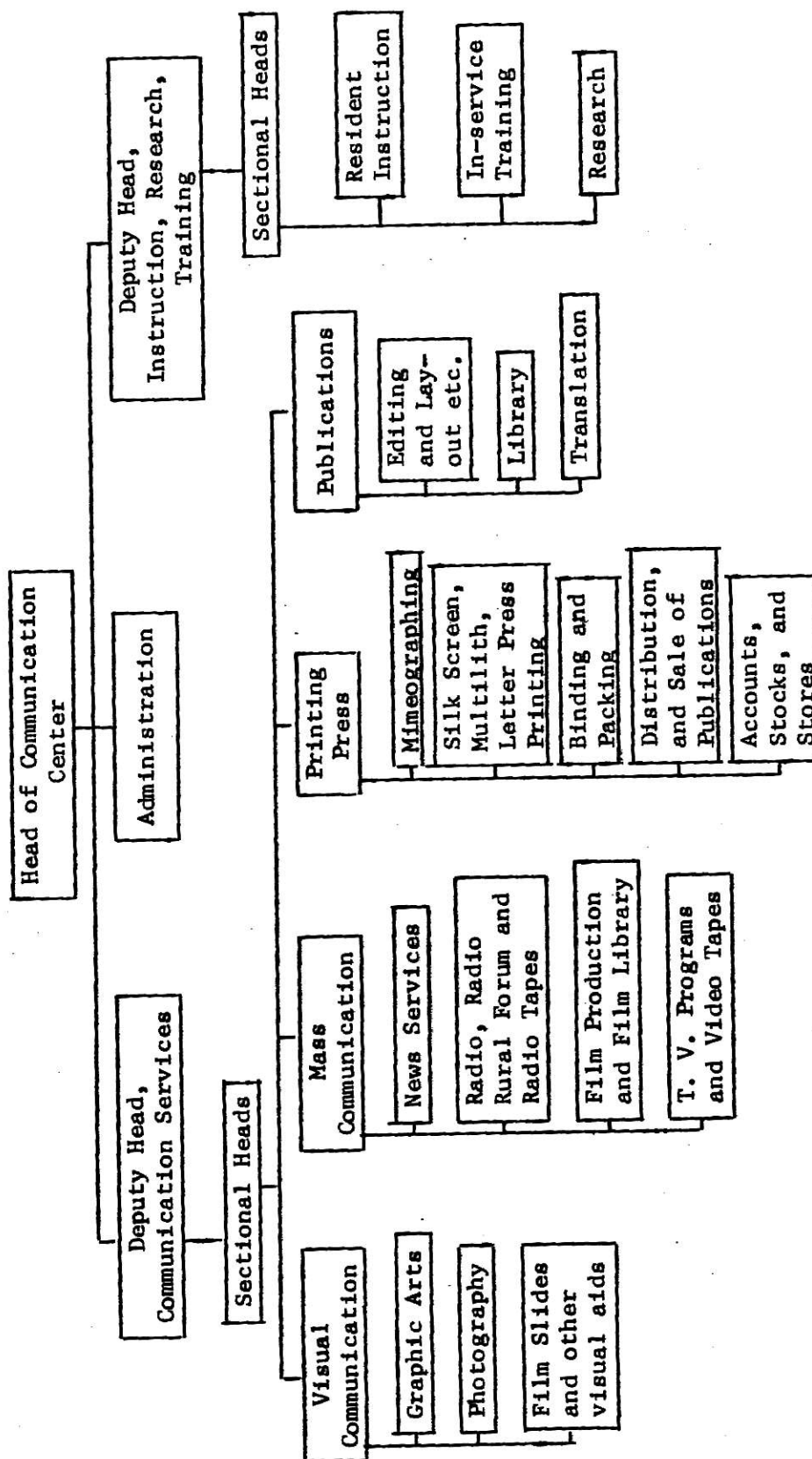
APPENDIX I
A University Communication Center



— Administration
- - - - - Coordination

APPENDIX II

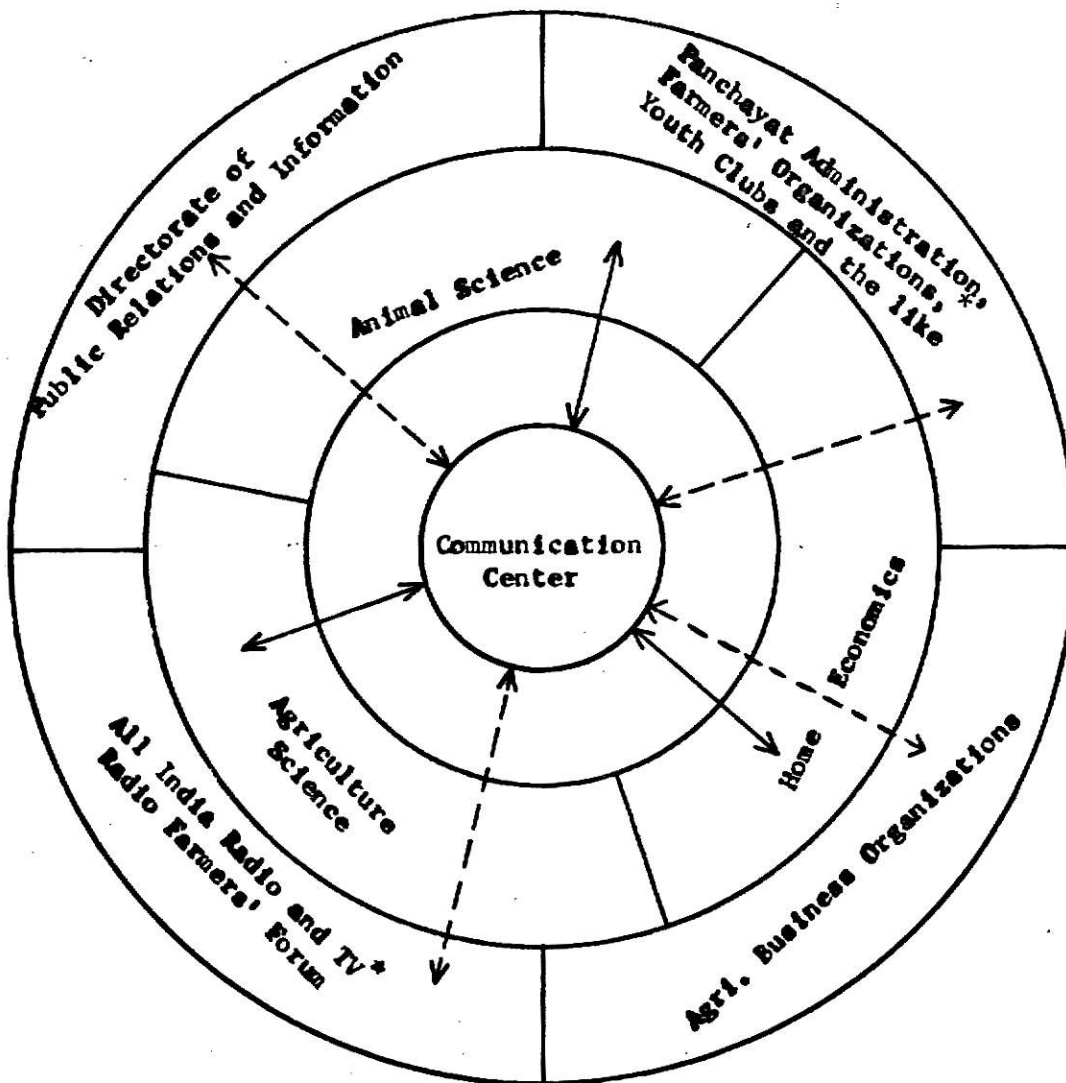
A Proposed Structure of Communication Center (sections indicated)



The personnel needed for each section may be determined depending on the volume of work, budget resources and the like. A minimum of one Officer with secretarial assistance is needed for each Section.

APPENDIX III

Communication Center and Its Relationships with Various Departments
in the University and Outside Agencies.



* Proposed. The other organizations already exist.

———— Administration
 - - - - - Coordination

APPENDIX IV

Books for the Agricultural Communications Library

1. Adoption of New Ideas and Practices, H. F. Lionberger, Iowa State College Press, Ames, Iowa, 1966.
2. Advertising Agency and Studio Skills, Tom Cardmone, Watson-Guptill Publications, New York, 10036, 1959.
3. Basic Developing, Printing and Enlarging, J-2, Eastman Kodak Company, Rochester, New York, 14650.
4. Basic Drawing, Louis Priscilla, Bramhall, New York.
5. Caligraphic Lettering, Ralph Douglas, Watson-Guptill Publications, Inc., New York.
6. Clip Art, 2 Books, American Association of Agricultural College Editors, Interstate Printers and Publishers, Illinois, 61832, 1967.
7. Commercial Art Techniques, Ralph S. Maurello, Tudor Publishing Company, New York, 1003, 1967.
8. Communications Handbook, The American Association of Agricultural College Editors, Interstate Printers and Publishers, Illinois, 1967.
9. Color Photography Indoors, E-76, Eastman Kodak Company, Rochester, New York.
10. Dark Room Design and Construction, K-13, Eastman Kodak Company, Rochester, New York.
11. Color Photography Outdoors, Eastman Kodak Company, Rochester, New York.
12. Shanker Nayaran English to Telugu Dictionary.
13. Shanker Nayaran Telugu to English Dictionary.
14. Kondal Rao Telugu to Urdu Dictionary.
15. Kondal Rao Urdu to Telugu Dictionary.
16. Standard Dictionary Urdu.
17. Standard Dictionary Urdu to English.
18. Standard Dictionary English to Urdu.

19. Webster's New World Dictionary, World Publishing Company, New York, 1958.
20. Figure Drawing for All It's Worth, Andrew Loomis, Viking Press, New York, 1967.
21. Flash Pictures, C-2, Eastman Kodak Company, Rochester, New York.
22. Getting Agriculture Moving, A. T. Mosher, Frederick A. Praeger, Inc., New York, 10003, 196 .
23. How to Organize and Operate a Photographic Service, P-17, Eastman Kodak Co., Rochester, New York.
24. Ink Drawing Techniques, Henry C. Pitz, Watson-Guptill Publications, New York, 1967.
25. Kodak Color Films, E-77, Eastman Kodak Company, Rochester, New York.
26. Magnetic Sound Recording, P-26, Eastman Kodak Company, Rochester, New York.
27. Mounting and Displaying Large Color Transparencies and Prints, E-55, Eastman Kodak Co., Rochester, New York.
28. Perspective for Sketchers, Ernest W. Watson, Reinhold Publishing Corp., New York, 10022.
29. Planning and Producing Audio-visual Materials, Jerrold E. Kemp, Chandler Publishing Co., San Francisco, California, 94105, 1967.
30. Practical Lettering, Robert Shaw, Tudor Publishing Co., New York, 1967.
31. Preparation of Inexpensive Teaching Materials, John E. Morlan, Chandler Publishing Co., San Francisco, California, 94105, 1967.
32. The Poster, Ervine Metzl, Watson-Guptill Publications, 1967.
33. Producing Slides and Filmstrips, S-8, Eastman Kodak Co., Rochester, New York.
34. Professional Printing, G-5, Eastman Kodak Co., Rochester, New York.
35. Silk Screen Techniques, J. I. Biegeleisen and Max Arthur Coh, Dover Publications, Inc., New York, 10014, 1967.
36. Techniques in Photography for the Screen Process Printer, R. O. Fossett, Signs of the Times Publishing Co., Cincinnati, Ohio, 45202, 1967.
37. Taking Surveys Among Farm Families, Harold D. Guither, University of Illinois, College of Agriculture, 1960.

38. Work Book for Writers, Sachs and others, American Book Co., New York, 10003, 1967.
39. Effective Writing for Engineers, Managers, Scientists, H. J. Tichy, John Wiley & Sons, Inc., New York, London, Sydney, 1967.
40. Audio-visual Materials and Techniques, James S. Kinder, American Book Co., New York, 10003, 1967.
41. Audio-visual Education, Cross and Cypher, Thomas Y. Crowell Co., New York, 10003, 1967.
42. Audio Visual Methods in Teaching, Edgar Dale, Holt, Rinehart & Winston, Inc., New York, 10017, 1967.
43. Co-operative Extension Work, Kelsey and Hearne, Comstock Publishers Associates, Ithaca, New York, 1963.
44. Copy Reading and News Editing, Howard Tyler and Jacob Schurr, Prentice Hall, Englewood Cliffs, New Jersey, 1965.
45. An Overview of Adult Education Research, Edmund DeS. Brunner (Ed.), Adult Education Assn. of U.S.A., Illinois, 1959.
46. Ways of Thinking of Eastern Peoples, Hajime Nakamura, East West Centre Press, Hawaii, 1964.
47. The Co-operative Extension Service, H. C. Sanders, Prentice Hall, Inc., Englewood Cliffs, New Jersey, 1966.
48. Audio-visual Instruction: Materials and Methods, Brown, Lewis, Harcelroad, McGraw-Hill Book Company, New York, 1964.
49. Interpretative Reporting, McDugal, Macmillan Company, New York, 1965.
50. Audio-visual Resource Guide, International Council of Religious Education, Council Press, New York, 10027, 1967.
51. USICA--All series 1 to 4.
52. Evaluation in Extension, Bryant.
53. For More Effective Teaching, Alfred H. Krebs, The Interstate Printers and Publishers, Illinois, 1967.
54. People, Society and Mass Communications, Lewis Anthony Dexter and David Manning White, Editors, The Free Press, New York, 1968.
55. Methods in Adult Education, Barson Morgan and others, Interstate Printers and Publishers, Inc., Illinois, 1963.

56. Campaigns Against Hunger, E. C. Stakman and others, The Bellknap Press of Harvard University Press, Massachusetts, 1963.
57. Successful Practices in Adult Farmer Education, Lloyd Phipps, Interstate Printers and Publishers, Inc., Illinois, 1954.
58. Mass Media and National Development, Wilbur Schramm, Stanford University Press, California, 1964.
59. Communication and Change in the Developing Countries, Daniell Lerner and Wilbur Schramm, Editors, East West Center Press, Honolulu, 1967.
60. Sociology, Lundberg and others, Harper & Row Publishers, New York, 1968.
61. Effective Feature Writing, Clarence A. Schoenfeld, Harper & Row Publishers, New York, 1960.
62. Reader in Public Opinion and Communication, Bernard Berelson and Morris Janowitz, Editors, The Free Press, New York, 1967.
63. Agricultural and Technical Journalism, Rodney Fox, Prentice Hall, Englewood Cliffs, New Jersey, Latest available edition.
64. Reporting Agriculture, William B. Ward, Comstock Publishing Associates, Ithaca, New York, 1959.
65. The Elements of Style, William Strunk Jr. and E. B. White, The Macmillan Company, New York, 1962.
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80. Besides the above publications, Delbert T. Myren, Information Specialist, Mexican Agricultural Program of the Rockefeller Foundation, has prepared a 101 page bibliography on Communications in Agricultural Development. The book contains 8 sections with over 1000 publications.
81. Similarly, Indiana University, Bloomington, Indiana, has brought out a 21-page list of more than 300 publications on teaching materials and aids in communications.

APPENDIX V

Equipment Needs^{*}

The following equipment is needed as a minimum.

1. Suitable desk and chair for each member of the staff.
2. Typewriter for each editor, translator, stenographer and typist.
3. Regional language typewriters at least one each in Telugu and Urdu.
4. Modern filing facilities for all working editors and clerical staff.
5. Miscellaneous office supplies commonly used (staplers, rulers, pencils and other such items).
6. One special typewriter for preparing copy for multilith reproduction--special ribbon required. Also, it should allow justifications of lines to produce straight margins.
7. At least one double-lens reflex camera with electronic flash equipment for black and white pictures mainly; for news releases and publication illustrations.
8. One 35 mm single lens reflex (SLR) camera with electronic flash equipment for making colored slides for teaching purposes.
9. One 35 mm camera for general slides and film strips production.
10. One 16 mm movie camera with accessories.
11. One photo process camera, complete with lighting equipment and accessories.
12. One photo-type, composing machine to prepare copy for reproduction, in offset plates.
13. One professional photographic enlarger and supplementary equipment for all sizes of negatives from 35 mm up.
14. One slide duplicator, or copying attachment for SLR camera.
15. Developing tanks and trays (commercial size and quality)
16. Photoprint washer, commercial.

^{*}From: References numbered 13, 21, and 37.

17. Photo print drier, commercial.
18. All photographic supplies required.
19. Drawing tables and instruments for each member of the visual aids' artists.
20. Letter guides and lettering sets, of various types and sizes.
21. One Pentograph large size.
22. Miscellaneous art and design tools and accessories (scissors, knives, straight-edges, brushes, scales, curves, etc.).
23. 35 mm slide and film strip projectors.
24. 16 mm motion picture projectors.
25. Projection screens.
26. Flannel boards, or felt boards.
27. Opaque projectors.
28. Overhead projectors.
29. Mobile vans (2) for transporting portable exhibits and audio-visual equipment to rural areas fitted with a power generator for using in areas lacking electricity. (Design to be taken from USIL, Hyderabad.)
30. One broadcast quality tape recording machine, preferably completely portable, but adaptable to electric line operation if suitable service is available. To meet standard broadcast requirements along with index meter and head phone.
31. At least two tape recorders for production of audio-aids for teaching purposes, with head phone and index meter.
32. Audio mixers and amplifier audio mixers.
33. Record players at least two.
34. Public address systems (transistorized and for electricity), 2 sets, quality type like RCA.
35. Field public address system incorporated into mobile units.
36. Portable transistorized megaphones.
37. Recording tapes.

38. Tape de-magnetizer (eraser).
39. Tape editing equipment.
40. Motion picture film servicing equipment.
41. Suitable racks for stocking publications.
42. Suitable racks for stocking films.
43. Suitable cabinets for film strips, slides, equipment, etc.
44. An offset press (model 500-S-Z) Fairchild Davidson 11" x 15" with capacity of 10,000 sheets per hour, with automatic ink roll cleaner, built-in chain gripper bar, automatic blanket throw-off, micrometer adjustment, variable speed control, automatic sheet counter, reset style, removable segments, both plate and impression, auxiliary ink vibrator attachment, light attachment, pneumatic-automatic pile receding stacker, automatic controls for stacker attachment, slow dampening oscillator attachment, quick change master segment, automatic ink ductor control attachment, extra plate segment for two-sided lithography to operate on 50 cycle 220 volt 3 phase power.
45. NuArc Platemaker (Model FT-18-A), 17" x 22" self contained unit, permanent reflector, central control panel, unobstructed frame, to operate on 50 cycle, 220 volt, 3 phase power.
46. Michael Lith Model No: 17 paper folder, with automatic feeding, variable speed selector, with capacity of 15,000 to 18,000 per hour, belt conveyor receiving tray, perforating and slitting attachments, with dust cover to operate on 50 cycle, 220 volts and 3 phase power.
47. Colitho direct image paper offset plates, size 11" x 15" for use on Davidson 500s offset press.
48. 3M Type E metal photo offset plates, size 11" x 15" for use on Davidson offset press.
49. Type fronts and furniture for hand compositions and makeup (include English, Urdu, Telugu languages).
50. Makeup or make ready tables.
51. Proof press.
52. Paper cutting machine.
53. Stitching machine (electrically operated).
54. Punching machine.

55. Ruling machine.
56. Addressograph, complete with racks and plates.
57. Mimeograph (cyclostyle) machine (electrically operated).
58. Book binding equipment.
59. Display cases and bulletin boards.
60. Silk screen equipment.

APPENDIX VI

Dealers and Distributors of Printing Equipment and
Supplies in India

The list is prepared by M. G. Kamath, Farm Information Director, Directorate of Extension, Ministry of Food and Agriculture, Government of India and is reproduced from The Agricultural University and Communication in a Developing Society, by J. P. Chapman (13).

Letter Press Printing Machines, Paper Cutting Machines, Stitching and Binding Machines, Automatic Folding Machines, Offset Printing Machines, and Print Shop Accessories.

1. M/s. Graphic Machinery and Appliances (P) Ltd., Calcutta - 13.
2. M/s Indo Europa Trading Co., Delhi - 6.
3. Standard Type Foundry, Chowri Bazar, Delhi.
4. Linotype Machinery Ltd., Calcutta - 13.
5. J. Mahabeer and Co. (P) Ltd., Delhi - 6.
6. Manubhai Sons and Co., Chowri Bazar, Delhi.
7. Eurasia Trading Co., Chowri Bazar, Delhi.
8. Vickers India (P) Ltd., Bombay - 1.
9. Standard Type Foundry (P) Ltd., Asifali Road, New Delhi.
10. Indo-European Machinery Co. (P) Ltd., Delhi - 6.
11. Monotype Corporation Ltd., Church Street, Bangalore.
12. Express Printing Service, Baroda - 1.
13. East Asiatic Co. (India) (P) Ltd., Asif Ali Road, Delhi.
14. Beekay Industries (India), Agra Road, Aligarh, U.P.

Paper

1. M/s. Banerjee (P) Co., Asif Ali Road, New Delhi.
2. Delhi Paper Trading Co., Delhi - 6.
3. Doomimal Ramchand, New Delhi - 6.
4. Jai Dayal Kapoor and Sons (P) Ltd., Delhi - 6.
5. Janata Paper Mart, Delhi - 6.
6. Mohan-lal Harikishenlal, Delhi - 6.
7. Oriental Paper Co., New Delhi.
8. Ramnath and Sons, Delhi - 6.
9. U. P. Paper Corporation (P) Ltd., Delhi - 6.
10. Eurasia Trading Co., Delhi - 6.

Offset and Letter Press Inks

1. M/s. Standard Type Foundry, Delhi - 6.
2. Modern Printer's Store, Delhi - 6.
3. Eurasia Trading Co., Delhi - 6.

4. J. Mahabeer and Sons (P) Ltd., Delhi - 6.
5. Raghubar Dayal Pannulal, Delhi - 6.
6. Printers' Emporium, Basti Harphool Singh, Delhi.

Accessory Supplies, including dampening covers, rubber blankets, solvents, chemicals and zinc plates

1. M/s. Process Chemical Co., Delhi - 6.
2. Raka Trading Co., Delhi - 6.
3. Photogoods Service, Ratehpuri, Delhi.
4. Alpha Trading Co., Calcutta - 13.
5. K. N. Seal and Co., Calcutta - 13.
6. Gunvantray and Co., Tamarind Lane, Bombay.
7. Scientific Supplies Corp., Delhi - 6.
8. Chemical de-universal, Phatak Habash Khan, Delhi.
9. Delhi Scientific Works, Ajmeri Gate Delhi.

Photo Process Film, Dark Equipment and Supplies

1. Kodak Ltd., Netaji Subhash Road, Delhi.
2. OR WO Films Pvt. Ltd., Asaf Ali Road, New Delhi.
3. Allied Photographics Ltd., Asif Ali Road, New Delhi.

Type and Type Casting Machinery

1. M/s. Monotype Corporation Ltd., Church Street, Bangalore.
2. Standard Type Foundry, Delhi - 6.
3. Kamla Type and Machinery Co., Delhi - 6.

Composing Machines for Photographic Reproduction

1. M/s. IBM World Trade Corporation, New Delhi - 1.
2. Printers' House Pvt. Ltd., New Delhi - 1.

Mimeographing and Duplicating Equipment

1. M/s. Roneo, New Delhi - 1.
2. Gestetner Duplicators Pvt. Ltd., New Delhi - 1.
3. Shourie Duplicators (P) Ltd., New Delhi - 15.

Adhesive Gum (also called rubber solution, rubber cement and gum paste) Used in Multilith Process

1. M/s. Calmin (P) Ltd., Bombay - 16.
2. M/s. Weldon Inks, Delhi - 5.
3. M/s. Griplex India Ltd., Calcutta - 1.

Firms Specializing in Materials and Supplies for Offset Printing

Dr. C. S. S. Rao, Joint Director of Information for the Package Program, Directorate of Extension, Ministry of Food and Agriculture, New Delhi and Dr. R. Lyle Webster, Acting Team Leader, IADP, Ford Foundation, New Delhi, prepared this list and it is reproduced from The Agricultural University and Communication in a Developing Society, by J. P. Chapman.

1. M/s. Monotype Corporation Ltd., Bangalore.
2. Alpha Trading Corporation, Calcutta - 13.
3. Linotype Machinery Ltd., Calcutta - 13.
4. Photogoods Service, Delhi - 6.
5. Eurasia Trading Co., Delhi - 6.
6. Standard Type Foundry, Delhi - 6 (Inks specially).
7. Modern Printing Stores, Delhi - 6.
8. Process Chemical Co., Delhi - 6.
9. Printing Material Stores, Delhi - 6.
10. Indo-European Trading Co., Delhi - 6.
11. Indo-European Machinery Co., Delhi - 6.
12. Standard Type Foundry (P) Ltd., New Delhi.
13. J. Mahabeer and Co., Ltd., Daryaganj, Delhi (Ink).
14. Raghubir Dayal Bansilal, Delhi - 6.

APPENDIX VII

Space Requirements

Suitable office space should be provided for the following:

- (i) Head of the Communication Center.
- (ii) Deputy Head, Communication Services.
- (iii) Deputy Head, Resident Instruction and In-service Training.
- (iv) Sectional Head, Visual Communication.
- (v) Sectional Head, Mass Communication.
- (vi) Sectional Head, Printing Press.
- (vii) Sectional Head, Publications.
- (viii) Sectional Head, Resident Instruction and Teachers.
- (ix) Research Publications Editor.
- (x) Extension Publications Editor.
- (xi) Local Language Translators and Typists.
- (xii) Administrative and Secretarial Staff.

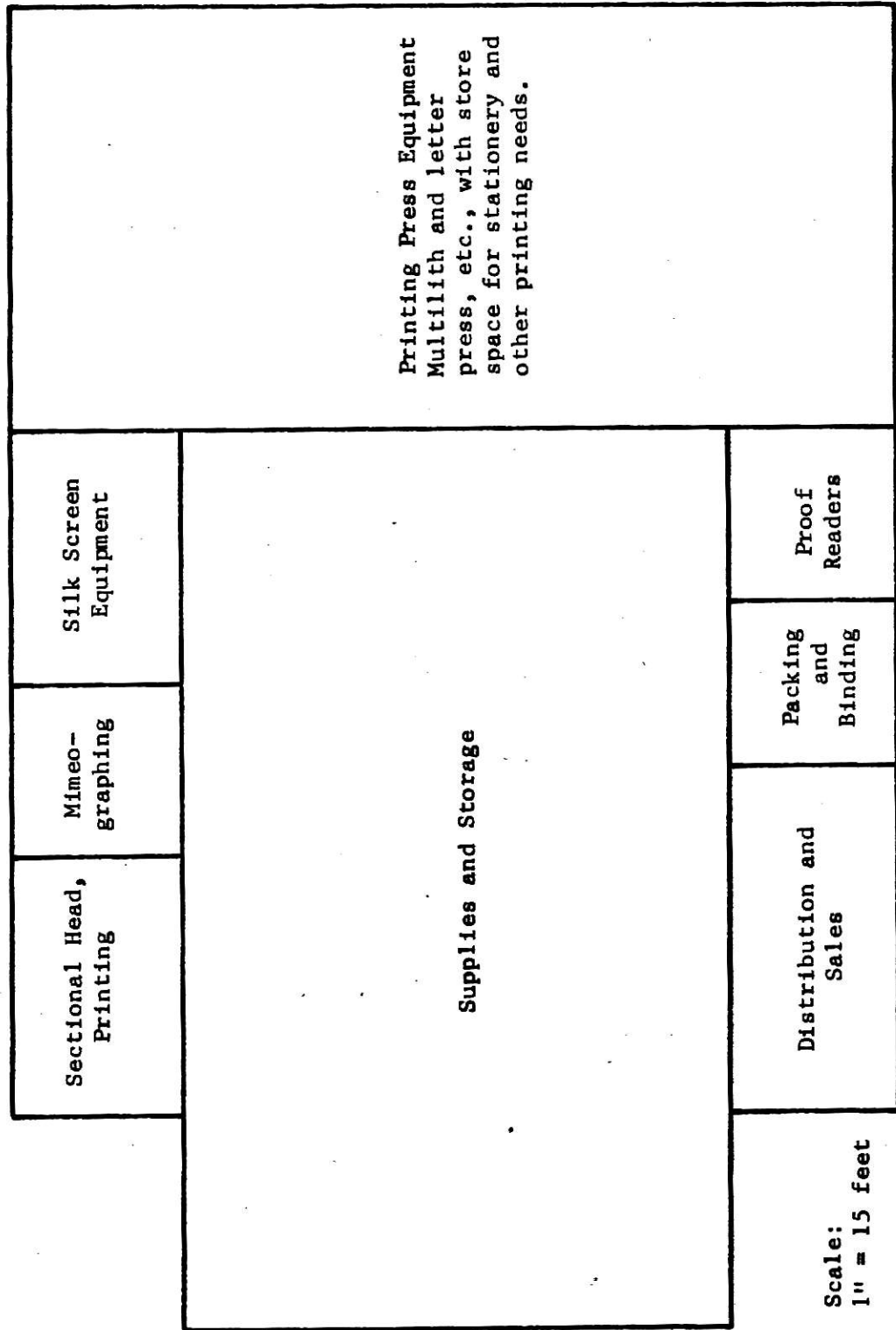
Adequate space has also to be provided for:

- (i) Air conditioned photographic laboratory, storage facilities and personnel.
- (ii) Air conditioned sound proof recording studio for making radio tapes.
- (iii) Visual Aids Laboratory, equipment and personnel.
- (iv) Silk Screen, Multilith, Mimeographing, Printing Press and allied equipment operation.
- (v) Library for books.
- (vi) Library for audio-visual aids.

- (vii) Committee Room.
- (viii) Exhibition Room for displaying improved seeds, manures, fertilizers, improved agricultural implements and the like.
- (ix) Publication distribution and sales center.
- (x) Store space for stationery and other printing needs.
- (xi) Projection room for testing audio-visual productions.
- (xii) Garages for vehicles.

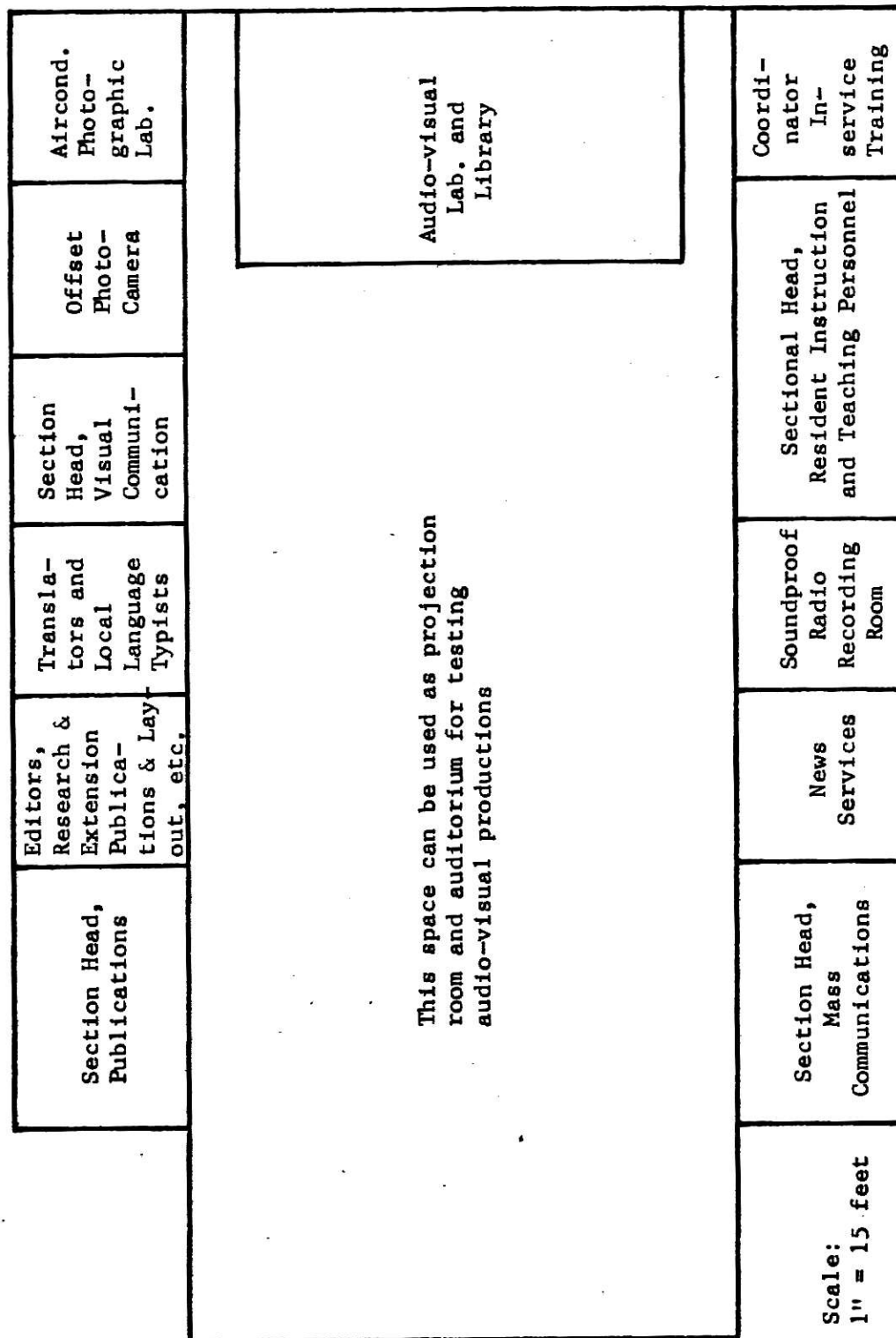
APPENDIX VII (1)

Communication Center--Basement



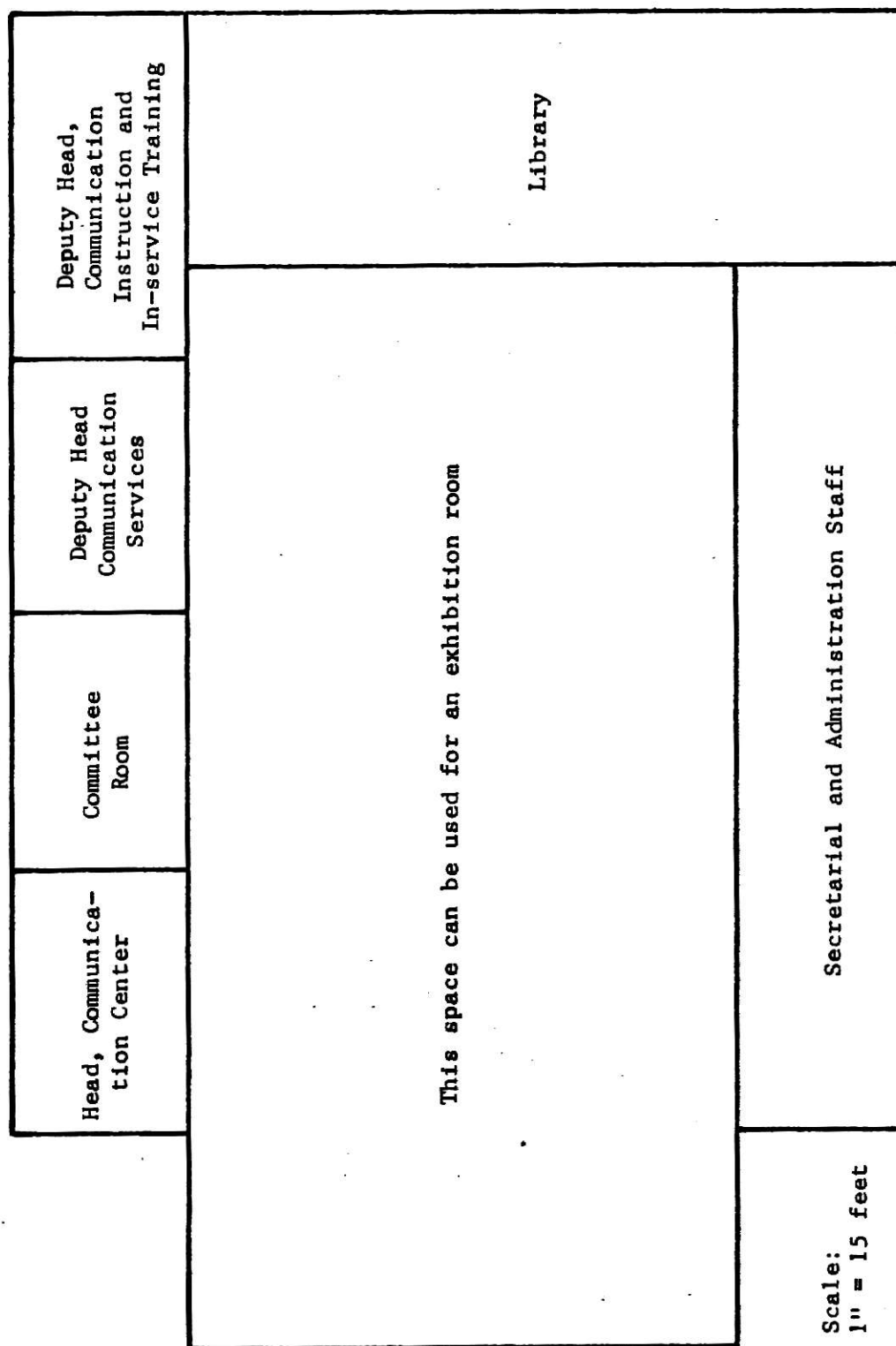
APPENDIX VII (11)

Communication Center--First Floor



APPENDIX VII (111)

Communication Center--Second Floor



APPENDIX VIII

Finances

The finances needed may be of the order of about Rs. 1,500,000 or about \$20,000 for the building, equipment, books and other nonrecurring expenditure, which is a modest estimate. Half of this amount will have to be spent during the first year and half during the succeeding two years. This projection of costs is highly approximate. Nevertheless, this estimate, which is in a position to take a broad view of the needs and means gives an idea of the general cost we are talking about particularly when one realizes that investments of this type should contribute to the general economic development and agricultural development in particular.

The recurring expenditure may be of the order of Rs. 300,000 per year for salaries, allowances to staff, requirements of the press, stationery articles and other expendible articles, and maintenance of equipment, transport and such other miscellaneous items of expenditure.

<u>Item</u>	<u>Nonrecurring</u>	<u>Recurring</u>
1. Building construction	Rs. 100,000	
2. Furniture, Equipment, Books, etc.	1,150,000	
3. Transport Vehicles, Fittings, etc.	90,000	
4. Printing Press	160,000	
5. Salaries and Maintenance and Miscellaneous		300,000
	Rs.1,500,000	300,000

Note: These figures are tentative and actual costs have to be worked out depending on the costs in India.

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**A PROPOSAL TO INCREASE AGRICULTURAL PRODUCTION THROUGH EFFECTIVE
COMMUNICATIONS BY AGRICULTURAL UNIVERSITIES IN INDIA**

by

VADLAKONDA DHANANJAYA RAO

B. Sc. (Agri.), Osmania University, Hyderabad, India, 1955

AN ABSTRACT OF A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Technical Journalism

**KANSAS STATE UNIVERSITY
Manhattan, Kansas**

1969

India's basic agricultural problem is low productivity. Average yields of most of her important crops rank among the lowest on earth. Agriculture is a way of life on about 60 million small and highly fragmented farms, most of which are neither fertile nor productive. The processes of production have to be changed. Farmers who follow traditional farming methods do so because most of them are not even aware that better methods exist. Such a situation should no longer continue. The farmers need to be better informed and better educated, if agricultural development is to be accelerated.

Wide distribution of relevant, specific and practical knowledge of improved agricultural practices is one of the main reasons for the success of farmers in the United States. The land-grant universities played a primary role in diffusing agricultural information. Any university seeking to serve the agricultural community as India's agricultural universities are, must be sure that its information is received, understood, accepted and applied by the farmers. That task should have highest priority.

Language diversification that complicates cultural, sociological, economic and traditional problems in India need not deter administrators. Well-organized Agricultural Communication Centers working efficiently and effectively throughout the country could take improved, recommended practices from the newly developing agricultural universities.

Nothing is more important for Indian agriculture today than the transfer of useful farming ideas from those who know (the scientists) to those who need to know (the farmers). Much information already is available to be disseminated and diffused to farmers and all of India's citizens need to have the information applied to solving food shortages. Methods such as small illustrated publications, radio and television, films and filmstrips

and the like, besides exploiting and encouraging the traditional folkways and folklore for agricultural development would go a long way, despite illiteracy. All mass media should help make all citizens aware of how important increased agricultural production is to their well being. Ways of using communication to take advantage of farmers' ways of thinking and doing and the reasons for the faster acceptance of new agricultural methods are given here. In-service training of present extension personnel and courses in communication at the agricultural universities to alleviate the scarcity of trained technical persons are detailed.

Agricultural Communication Centers, when established at agricultural universities, would help current extension workers with educational materials (publications, visual and audio-visual aids) and improved educational methods.

The report discusses other problems of Indian agriculture and the importance, processes, roles and effects of communication in developmental programs. Key human elements and critical factors that a communicator needs to be aware of in agricultural development are also discussed. The present status of mass communications through mass media in relation to agricultural development in India is included.

The report concludes with a suggested organization for Agricultural Communication Centers, which would provide teaching and research in Communications in addition to their extension education programs.