# TECHNOLOGY TRANSFER MODEL - AN ANALYSIS OF LINKAGES

By

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HISAR

1993

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## CERTIFICATE - I

This is to certify that this dissertation entitled, "Technology Transfer Model - An Analysis of Linkages" submitted for the degree of Ph.D. in the subject of Agricultre (Extension Education) of the Chaudhary Charan Singh Haryana Agricultural University, is a bonafide research work carried out by Shri Joginder Singh Malik under my supervision and that no part of this dissertation has been submitted for any other degree.

The assistance and help received during the course of investigation have been fully acknowledged.

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This is to certify that this dissertation entitled, "Technology Transfer Model - An Analysis of Linkages" submitted by Shri Joginder Singh Malik to the Chaudhary Charan Singh Haryana Agricultural University in partial fulfilment of the requirements for the degree of Ph.D., in the subject of Agriculture (Extension Education), has been approved by the Student's Advisory Committee after an oral examination on the same, in collaboration with an External Examiner.

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## ABBREVIATIONS USED

| | |
|---|---|
| ADEE | Additional Director of Extension Education |
| ADO | Agricultural Development Officer |
| AES | Assistant Extension Specialist |
| AI | Artificial Insemination |
| ANP | Applied Nutrition Programme |
| CAO | Circle Agricultural Officer |
| CCSHAU | Chaudhary Charan Singh Haryana Agricultural University |
| CD | Community Development |
| DA | Daily Allowance |
| DAO | District Agricultural Officer |
| DDA | Deputy Director of Agriculture |
| DEE | Director of Extension Education |
| DES | District Extension Specialist |
| DR | Director of Research |
| EEAC | Extension Education Advisory Committee |
| FASC | Farmers' Advisory Service Centres |
| HAFED | Haryana State cooperative Supply and Marketing Federation Limited |
| HOD | Head of Department |
| HSDC | Haryana Seed Development Corporation |
| HYV | High Yielding Variety |
| IADP | Intensive Agriculture Development Programme |
| IARI | Indian Agricultural Research Institute |
| ICAR | Indian Council of Agricultural Research |
| ICDS | Integrated Child Development Services Scheme |
| IFFCO | Indian Farmers Fertilizers Cooperative Limited |
| IJEE | Indian Journal of Extension Education |
| KGK | Krishi Gyan Kendra |
| KRIBHCO | Krishak Bharti Cooperative Limited |
| KVK | Krishi Vigyan Kendra |
| NAFED | National Agriculture Cooperative Marketing Federation |
| NDRI | National Dairy Research Institute |
| NES | National Extension Service |
| NFL | National Fertilizers Limited |
| PAU | Punjab Agricultural University |
| POL | Petrol, Oil and Lubricants |
| SMS | Subject-Matter Specialist |
| TA | Travelling Allowance |
| TV | Television |
| ULES | University-Level Extension Specialist |
| YMCA | Youngmen Christian Association |

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# CHAPTER I

## INTRODUCTION

*"Buildings and equipment will not make a great university or create a dedicated and dynamic extension service. It is men and women who will make or mar an institution or enterprise. As everybody connected with this university knows, the Government wants Haryana Agricultural University to be the best in East, and there is no reason why this objective should not be achieved, provided all of us work whole-heartedly towards it".*

*Fletcher (1971)*

Soon after independence of the country, the twin problems of poverty and acute shortage of food were realized. Whole of the country was in a state of extreme type of socio-economic backwardness and almost every aspect of development needed immediate and urgent attention. These included prevalence of a number of diseases in rural and urban areas, illiteracy, chronic indebtedness, lack of means of transport and communication and similar other problems. Obviously, all these problems needed to be tackled simultaneously. But the urgent need of the hour was to meet the shortage of the food.

### 1.2 Indian Rural Scenario

It is well known that people living in villages and farming the land around the village had an established pattern of life in India since time immemorial. Since the needs of rural people were quite few and mostly they depended on nature for their welfare, several of their needs were met in the

villages themselves. A sizable number of young, healthy and able bodied men from rural areas were taken into armed forces and they were almost cut off from the village and the problems of the rural society. Village people with better socio-economic status who were quite few preferred to stay in nearby towns or cities. The economy in rural areas was so much constrained that most of the people remained in debt net for most of the time all the year round. The agriculture or livestock farming being traditional was not at all remunerative as the yield per unit of land was very low. A lion's share of the crop produce often went to the money lender who exploited the villagers to the maximum possible. So much so that it used to be only occasionally that villagers were free from debt. This vicious circle and the then political scenario led them to lead a life of misery and suffering more often than not.

With independence in 1947 after 150 years of British rule, India accepted the primary responsibility for solving many problems that faced the people and the nation. The state of the people was characterized by poverty, hunger, malnutrition, ill-health, and illiteracy. Also with independence, the goals of the government changed from maintenance of law and order to economic and social development. With 80.00 per cent of its people living in villages, 73.00 per cent of its people deriving their livelihood from farming, and 51.00 per cent of its national income coming from agriculture, India has been and is mainly a nation of rural people and farmers.

During the pre-independence period, scattered and short lived efforts toward rural development were made in various parts of the country. Notable among these were Mahatma Gandhi's experiments at Sevagram, Tagore's work at Sriniketan, Spencer Hatch's attempts at Marthandom, F.L.Brayne's work in Gurgaon, Sarvodaya Program, the Firka Development, and the Indian Village Service. Albert Mayer's highly successful project at Etawah was the immediate precursor of the nationwide Community Development Program as claimed by Axinn and Thorat (1972). For centuries together, the rural areas remained neglected and development programmes in villages were not known. Because of constant suffering, neglect in significant income which was not sufficient even to make both ends meet, and inaptitude of the rulers, the rural people became highly security oriented. They came to develop a conviction that whatever they were practising was the best within their resources and circumstances. As a result, they depended on practices tried from generation to generation and it was quite difficult to dissuade them from traditional practices.

**1.3 Post Independence Scenario**

The Royal Commission on Agriculture in India (1928) made valuable recommendations for the improvement of agriculture and rural economy. Since then, momentous events have changed radically the Indian economy and the agricultural scene. After independence, the Central and State Governments adopted the objectives of planned economic growth and social development. The introduction of the new strategy in mid-sixties in

agricultural production ushered in a new era of growth and social institutional changes. It was realized that to facilitate the establishment of a prosperous and egalitarian rural society, the agricultural sector had to grow at a rate much faster than before for the sake of the growth of the entire economy.

### 1.3.1 Community Development

In an attempt to improve the economic condition, the planning commission formulated the 'First Five Year Plan' in 1950. As a part of this overall plan, the 'Community Development Programme' was launched on 2nd October, 1952, to bring about a transformation of the economic and social life of the Indian people.

The main objective of community development programme was to bring about all round improvement of the rural areas covering all aspects of rural life, such as, agriculture, animal husbandry, rural industry, education, health, cooperative, panchayat, etc. It was considered as a movement, a process and a programme for bringing about socio-economic changes. But the same could not be achieved and it was realized in 1959-60 that 'Community Development Programme' was unable to solve the immediate problem of food scarcity. It was felt that the available scarce resources were thinly spread with no impact. The emphasis shifted from overall development to selective approach of 'Intensive Agricultural Development'. Nevertheless, keeping in view the recommendations of the

'Committee on Plan Projects' (1957), 'Panchayati Raj System' was introduced to mobilize active and voluntary participation of the people at the grass-root level in the development programmes.

### 1.3.2 Strategy for Agricultural Development

Under the new strategy for agricultural development adopted in 1966-67 the development programmes were revised to meet the needs of the farmers. This included production and supply of improved seeds of 'High Yielding Varieties' (HYV), to transfer relevant science and technology to the farmers, supply of inputs and institutional credit for crop production besides special emphasis on the programmes for upliftment of the weaker sections of the rural people, particularly, small and marginal farmers and agricultural labourers.

Of the several programmes taken up for the development of agriculture, the launching of 'Intensive Agricultural District Programme' (IADP) in 1961, 'High Yielding Varieties Programme' (HYVP) in 1966-67, 'Drought Prone Areas Programme' (DPAP) in 1970-71, 'Whole Village Development Programme' (WVDP) in the Fifth Plan Period, etc., need special mention as these programmes led to a substantial increase in food grains production. Probably, the most significant progress in agricultural extension worldwide in seventies has been the development of a new (or reformed) extension system called the Training and Visit Extension System and its successful implementation in several very large countries in South Asia and East Asia (Cernea, 1981).

## 1.4 Evolution of Agricultural Universities

The urgent need for food production for the ever increasing population forced the country to focus attention on agricultural education, research and extension of applicable research findings to the concerned clientele.

Interestingly, the University Education Commission (1949), headed by Dr. S.Radhakrishanan had already emphasized the need for establishing Rural Universities. According to the Commission, a rural university was to include resident colleges, with specialized facilities at its centre. In these rural colleges, general studies were to be combined with practical courses so that the students could become cultured and educated citizens, and skilled in one field or the other for gainful employment and advanced training.

The 'First Joint Indo-American Team on Agricultural Research and Education' (1955), endorsed the recommendation of the Radhakrishanan Commission and recommended for setting up of agricultural universities on the pattern of 'Land Grant Colleges' of the U.S.A.

Accordingly, the first important step in the development of Indian agriculture was the establishment of agricultural universities in seven states including the erstwhile Punjab in 1960-65.

## 1.5 Role of Agricultural University

The actual role performance of agricultural universities in rural development is concerned, different agricultural

universities have come out with varying outcome of their roles and performance depending upon the state's interests, financial, and other limitations. The actual role played by some of the leading agricultural universities in the country, including Chaudhary Charan Singh Haryana Agricultural University, Hisar (henceforth to be referred as HAU) in rural development may be stated as follows:

(i) Imparting instructions in the various subjects of Agriculture, Veterinary Sciences, Animal Sciences, Home Sciences and Basic Sciences so as to provide trained manpower for the scientific development of agriculture, livestock, farm and home and allied rural sectors.

(ii) Generating knowledge and development of appropriate technology through research for providing solutions to the problems confronted in optimising agricultural and livestock production and improvement of rural households for a better life.

(iii) Undertaking location specific agricultural research with the establishment of strong multi-disciplinary regional research stations so as to meet the specific research requirements of different agro-climatic situations to develop need-based technology for the farmers.

(iv) Transferring the applicable and useful research findings and improved technologies in agriculture and allied fields to the concerned clientele quickly and efficiently. This includes:

(a) advisory work and feedback of farmers problems to the conerned subjectmatter departments of the university for finding solutions for onward transmission to them;

(b) organising and conducting training programmes of short and long durations for different categories of clientele comprising farmers, farm women, rural youth, subjectmatter specialists, field functionaries of agriculture, animal husbandry and development departments, school teachers, defence personnel and others like Bank Officers, Indian Administrative Services and State Services Probationers;

(c) information communication through various mass media utilizing a variety of channels suited for the purpose;

(d) publication of popular and extension literature in the form of leaflets, handouts, magazines in local language for education of farmers on improved practices and technologies;

(e) production of audio-visual material for utilization by the farmers and field functionaries for learning improved technology;

(f) organization of Kisan melas, Farm Darshans, etc., for facilitating the exposure of farmers to improved methods of farming by arranging their conducted visits to the university farms agricultural exhibition and providing them opportunities for having discussions of their problems with the subjectmatter specialists of the university;

(g) organizing workshops at the university campus for the agricultural and animal husbandry officers of the State Departments to keep abreast of the latest advances in the profession, developing programme of work for implementation in the field based on the package of practices finalised in these workshops; and

(h) establishing an efficient and effective linkage between the University and Development Departments of the State so as to ensure maximum functional collaboration between the field functionaries of the State Government and the scientists of the university for successful implementation of the extension programmes at the grass-root level.

It may not be out of context to mention here that HAU, with its unique model of 'Extension Education System' could achieve these objectives to an appreciable degree.

No doubt, the above mentioned funtions of the agricultural universities have gone a long way in increasing

agricultural production in several states and even most of the developed countries have applauded India's efforts. There has also been an appreciable socio-economic transformation leading to the improvement in the living standard of rural people in several states.

**1.6 The Problem**

Taking a stok of the actual state of affairs of overall development, the situation is far from satisfactory and it has often being pointed out that the innovations in agriculture have helped only the affluent and progressive farmers. The farmers with small, marginal and medium sized land holdings have yet to get the desired benefits of the innovations for optimising production on their farms. Ever since the independence of the country several technology transfer models have been tried and as already pointed out earlier there has been tremendous improvement in the overall production of agriculture, livestock, poultry, etc.

What is noteworthy here is the fact that every agricultural university (presently there are 27 agricultural universities in the country) had its own model for the transfer of technology. It was certain that the transfer of technology, that is, bringing home to concerned clientele the useful information generated through research and feedback of the problems encountered in the use of technology to the research stations also constituted as one of the major functions of the agricultural universities. But all the agricultural

universities in the country did not come up with a sound, 'Extension Model' envisaged in the extension objectives of the university.

### 1.6.1 HAU Model for Transfer of Technology

The HAU model of technology transfer has been considered to be unique and a wide variety of activities both in the field and at the university campus have been carried out. The organizational set up under this model has been elaborated in Chapter 2.

### 1.6.2 Importance of Linkages

The efficient technology transfer requires interdepartmental, intradepartmental interaction both within and outside the university. Even in the same department, collaboration and cooperation is needed from top to bottom, that is, between the Director and Head of Department and the field functionaries for successful implementation of the extension programme. Efficiency is needed at every step right from conceptualizing an activity to its implementation and organization. In other words, there should be functional linkages which should not only be efficient but also effective. In a seminar on "Research and development linkages and feedback in agricultural development", Jakhar (1993) urged agricultural scientists, extension workers, official and non-official agencies to strengthen the information coordination work at the grass-root level. In the same seminar, Chopra (1993) said that a clear delineation of work distribution among different agencies and

proper coordination would go a long way in making the new technologies available to farmers.

### 1.6.3 Need for Analysis of Linkages

As well broughtout in the succeeding chapter, the model of technology transfer of HAU, has undergone a lot of change ever since its inception. The number of 'Krishi Gyan Kendras' (KGKs) have increased with the increase in the district headquarters, and presently there are 12 KGKs (6 of these recently got converted in Krishi Vigyan kendras) in the State (Figure 1.1). The number of University Level Extension Specialists (ULESs) as well as District Extension Specialists (DESs) have increased. It is an established fact that with the increase in the age, size and similar other aspects of an organization, there is simultaneous increase in the functional complexity of an organization. Obviously, under these circumstances the linkages might become weak, thereby, adversely affecting its performance.

Having been in operation for more than two decades it was considered quite inevitable to have a critical analysis of the linkages of the technology transfer model of the HAU to bring about required improvements wherever needed to strengthen the linkages. The budget allotted to the Directorate of Extension Education at the time of inception of the university was only 20.41 lakh. However, the budget allotment during the year 1992-93 was 287.45 lakh. Since huge amount of money and sufficient manpower and other resources

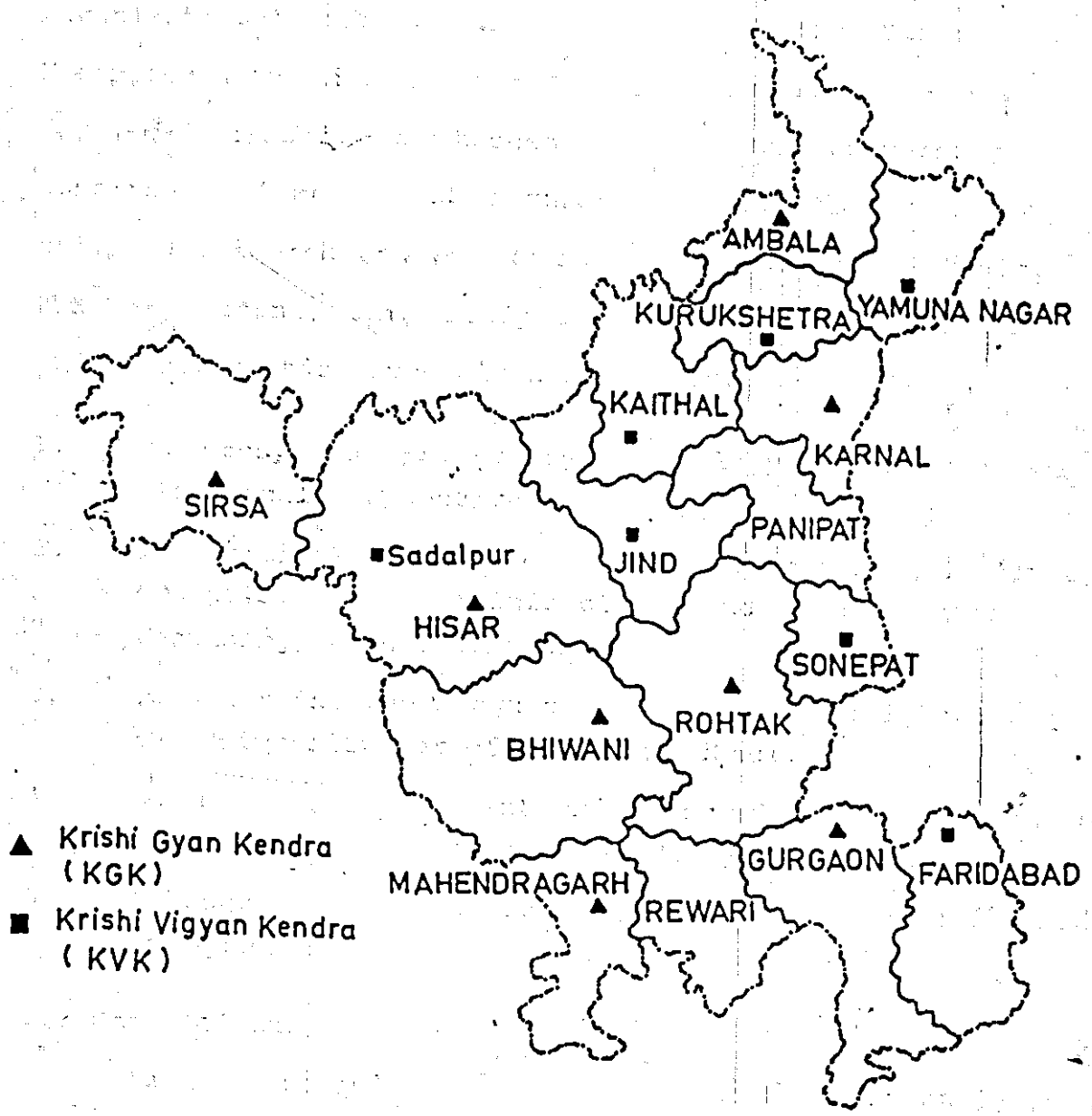



FIGURE 1·1 LOCATION OF KGK's AND KVK's IN HARYANA

are involved in the transfer of technology, the existing organizational set up in the form of the Directorate of Extension Education of the University should meet the needs for quick transfer of technology from the university to the concerned clientele and required feedback to persue problem-oriented research and extension work on continued basis. With this background, this study is proposed to be taken up with the specific objectives given hereunder:

1. To study the university technology transfer model in historical perspective.
2. To critically examine the interdepartmental linkages essential for reinforcing and revitalizing the technology transfer model.
3. To determine the adequacy of linkages within and outside the university for efficient feedback.
4. To make an assessment of farmers' perception of the technology transfer system of the university.
5. To suggest modifications in the existing extension model for quick transfer of technology.

## 1.7 Scope of the Study

In the process of technology transfer the analysis of linkages constitutes an highly important step. High hopes have been laid on the agricultural universities for meeting the research needs for crop production, livestock production and home economics. On the one hand, the researches in these areas have to be problem-oriented, on the other hand, the results of applicable value available from research stations need to be

quickly transferred to the concerned clientele. This would be possible only if the linkages in the extension organization or in the technology transfer model are not only strengthened as a matter of routine but also reinforced on continued basis. This research had been directed to critically examine these linkages at different levels. It is expected that the findings available from this research would be of immense value to the agricultural universities working on the Land-Grant Pattern of the Universities in the United States of America (U.S.A.).

An endeavour has been made to cover head of Subjectmatter Departments, University Level Extension Specialists, District Level Extension Specialists besides field functionaries of the Department of Agriculture. In addition to this, an assessment of farmers' perception of the technology transfer system of the university has also been studied. Undoubtedly, this would help in bringing to surface the weakness in the technology transfer model and to bring about required improvements and modifications in the model wherever considered necessary.

**1.8 Limitations of the Study**

The study was conducted under the constraints of time, money and similar other factors which are peculiar to a student research project. Though the study was limited to the extension functionaries in the HAU Directorate of Extension Education, Agricultural Development Officers (ADOs), Circle Agricultural Officers (CAOs), Subject-Matter Specialists

(SMSs) and a cross-section of farmers from different districts of Haryana yet it is a type of research project which needs to cover several other types of respondents both from the University and the State Government. In spite of all these limitations the study contains some useful information concentrating on the linkages in the technology transfer model which could be of sufficient utility to the concerned organization and similar other organization and institutes which are committed to the process of technology transfer from research stations to the concerned users of the technology.

## CHAPTER II

## THEORETICAL ORIENTATION

> *"Although agricultural research and agricultural extension obviously have a common ultimate objective, there is often little close collaboration between them. The reasons for this lack are more complex than much of the casual discussion and rhetoric around this topic would indicate. Seldom are the underlying technical, institutional, sociological and economic implications of building up such linkages confronted squarely, analysed in detail and translated into action programs. Thus, the weak linkages between research and extension persist as a critical constraint on these support services and on the promotion of agricultural development in general".*

*Michael et al.,(1983)*

In designing a study on the analysis of linkages in a technology transfer model, it was apt to have a careful and indepth examination of the existing technology transfer model of HAU (Figure 2.1). Obviously, in the first instance it calls for taking a stock of the achievements made so far. Since the study of the HAU technology transfer model in historical perspective constitutes one of the objectives of this investigation, some of the available relevant information on this account will be presented hereafter in the Chapter V on results and discussion.

### 2.2 Field of Rural Education

While this study deals with the technology transfer model of Agricultural University with major emphasis on the technology transfer model for the development of agriculture and allied sciences, the National Education

Association of the United States of America as back as 1940 in a report of the 'Committee on Program and Policy, Department of Rural Education' (Baldwin et al., 1940) discussing in the field of Rural Education observed as follows:

(i) In addition to the general science and art of education, rural education is concerned with those distinctive educational problems in rural areas that require special adaptation of methods and materials in their solution.

(ii) Rural education includes in its scope approximately one-half of the children and youth in the United States and more than half of the teaching personnel.

**2.2.1** Describing the procedures for effectuating rural education policy, the aforementioned report specified as under:

(i) The provision of an effective educational program for rural areas requires a broad attack on the problems involved.

(ii) Educational research and experimentation that analyze problems, secure data, develop principles and try out new methods should provide a sound basis for solution of rural education problems.

(iii) Effective dissemination of the best educational ideas and ideals is essential to progress.

(iv) Much of the needed improvement in rural education depends upon state and national legislation.

(v) Leaders in rural education should maintain cooperative working relationships with lay organizations interested in rural life and education.

(vi) Leaders in rural education should maintain national, state and local organization to study and foster rural education.

## 2.3 Systems Involved in Transfer of Technology

In the process of agricultural development, Dwarakinath and Chhane Gowda (1974) observed that the prime mover was considered to be the new agricultural technology. The benefit of such a technology was actually derived only when it was efficiently utilized by individual farmers in their local situation. If this were to happen, the new technology should be transmitted from source, where it was generated to the farms where it was applied and so represented as to become acceptable to the adopters. Of course, this was taking place to a certain degree. In this context, the authors identified at least three aspects of the problem: (i) Not all available technology was transmitted to the field; (ii) Not all potential adopter groups got exposed to the new information to the same degree; (iii) Even among the adopters of new technology such of its components that were visible, less expensive and compatible with local-practices got accepted more readily than others.

There were three 'functions and correspondingly three systems involved in the generation, dissemination and integration process of innovations. These included research system, extension system and farming or clientele system (Dwarakinath and Chhane Gowda, 1974). A theoretical orientation of these systems is presented below:

**2.3.1 Research system:** This system was responsible for the creation of new information from which a new technology emerged. Such creation of knowledge was often supposed to be in

response to farmers important felt-needs and field problems. But the research system functioned somewhat in isolation (Dwarakinath and Chhane Gowda, 1974). Research personnel were often severely limited in their understanding of extension needs and practices and the feedback of farm production problems to the research was usually inadequate (Richardson, 1967).

Byrnes (1968) reported instances when field trials of new practices showed only slight increase over the farmers' averages and probably less than what the good farmer was already getting. According to Castillo (1963), farmer's test of relevance was whether the practice was superior on his farm or his neighbour's farm and not only at the experiment station farm. The degree of constraints in diffusion and adoption of an innovation would ultimately depend upon the minimax advantage of the innovation (Byrnes and Byrnes, 1969).

**2.3.2 Extension system:** This system operated between the research system and client system. The manner in which new technological advances flow through this system depended on certain factors, viz., understanding of individual and groups regarding the purpose and manner of handling the new technology number of links in the communication chain or the levels of hierarchy within the system and the means of communicating new technology in terms of the type of written communication, meetings and training programmes (Dwarakinath and Chhane Gowda, 1974). The authors further observed that the extension system was not entirely composed of persons who were equipped to do

this job efficiently. Their knowledge and skills of both the technology and manner of its transmission needed improvement.

The level of expertise knowledge about the subject-matter with which a communicator was viewed by the recipient farmers had influence over his success as communicator (Singh, 1974). Closely related to technical inadequacy and extension was the question of attitude and commitment of the change agent (Dubey, 1974). Sinha (1966) reported that in majority of cases attitude of change agents towards change programmes varied from neutral to non-favourable. Singh (1974) quoted a study which revealed that extension officials did not involve themselves fully in any activity accelerating transfer of technology. Dwivedi (1972) reported that not only the people in villages, even the field officers at the block and district levels did not have comprehensive knowledge of various schemes and lacked confidence in providing information to beneficiaries.

Pal (1964) remarked that many extension agents had only 'book knowledge' of farming. Byrnes (1968) observed that 'extension agents' easily run out of contents for teaching. They did not have a more practical and efficient practice to present as an alternative to farmer's tested practices. Lerner and Schramm (1967) pointed out lack of tested farming informational materials to disseminate.

Richardsan (1967) opined that the depth of training of most extensiona gents was insufficient for the problems they faced. In a study quoted by Byrnes (1968) extension agents was

reported by farmers to be young and not too experienced, and could not answer many of their questions. Hill (1965) viewed that in many countries traditional attitudes and unsubstantiated opinions concerning farmers and farming held by elite groups including many policy makers and administrators in government constituted a much greater roadblock to agricultural development.

Villanueva (1963), Mamoria (1966), Lerner and Schramm (1967) and Byrnes (1968) reported lack of sufficient well-trained personnel to provide the intensity of services needed. An ill-trained and ill-equipped extension machinery could not create situation conducive to learning for farmers (Baweja, 1974). Availability of adequately trained and motivated workers was a crucial precondition of effective transfer of technology (Singh, 1974).

Byrnes (1968) pointed out that much of the resistance on the part of the farmer was frequently generated by change systems and their representatives. The author observed that excessive workloads, too extensive a geographic area of coverage, low salaries, lack of recognition for services rendered, etc., were other issues to be considered.

**2.3.3 Farming or client system:** This system consisted of clientele groups concerned with the utilization of technology. The 'Joint Indo-American Study Team' (1970) laid down that the impact of extension education programme on rural countryside depended not only upon the skills of extension workers and the innovativeness of university's research staff but also upon the

responsiveness of the rural population and the strength of the supporting agencies. "With the same staff", the team observed, "impact will vary from area to area depending upon natural and socio-economic conditions".

**2.4 Linkages**

An examination of the foregoing research system, extension system, farming or client system suggests that these systems are dependent on each other. Not only this, every basic component of these systems need to interact and enrich one another in ways that every action adds to the strength of the other system. Theoretically, this as a corollary may look to be not so difficult but the experience has shown that this is quite difficult to achieve on the floor.

Highlighting the basic activities involved in the task of technology transfer, Singh (1974) pointed out three broad components, namely, (i) production of technology, (ii) utilization of technology, and (iii) a mechanism to link the two, we call dissemination/communication/extension system. Obviously, production of technology refers to the research endeavours to find solution to the problems in farming; the utilization of technology need to take place at the level of the farmers in a way that there is full adoption of the recommended practices and the ultimate responsibility of bringing home the relevant technology to the farmers in ways that not only make them to properly understand the various intricacies involved in the application and use of technology but also ensure continued use of the same.

Ven Katesan (1985) discussing on improving research-extension linkages observed that a range of problems that surface with an effective extension system in place and that require strong research-extension linakge, which according to the author was acknowledged as 'crucial to the success of extension. The author opined that there were many factors that influenced this linakge. Unless these factors were analyzed, it was not possible to establish firm and enduring interaction. The linkage, the author pleaded should not depend on the chance contact, at the personal level, between the research scientist and the extension worker deployed at a place. Rather, linkage should be an integral part of the system. Pinpointing the pre-requisites for the establishment of the meaningful research-extension linkage the author suggested the following:

(i) extension message should be based on research conducted in the agro-climatic zone for which they are intended,

(ii) research trials near farmers fields should simulate what takes place on the fields. This entails more emphasis on factors other than technological ones, such as, farmers' endowments, risk situation, sociological realities, and the combined effect of these factors on farmers adoption of recommended practices, and

(iii) an effective extension system, that is, capable of diagnosing field problems and transmitting them to research establishments.

Linkages in the transfer of technology in reality constitute a type of circulatory system which to enthuse life and health in a body has to work round the clock on continued basis with utmost efficiency. In other words, the research

system should be in constant touch with the field problems and the solution to the problems generated by this system should percolate down through the extension system to the actual users or practioners of the information available from the research station. The experiences of the farming system should keep coming to the research station for further research and this circle should keep on moving for mutual interest and increasing productivity per unit of land. Nevertheless, the extension system has to be very active to upkeep these linkages between the research system and the farming system. Weakness in linkages in any of the systems will throttle the research systems and with the passage of time there are chances that the research system may become simply a ritual. Under these circumstances, the researches may not be problem-oriented and perhaps may not be of much utility for the farming system. Obviously, under such a state of affairs the linkages become not only weak but also get lost. When generation of new information is not tuned to the field problems or when the research is not need-based, extension system has to depend on the old information which might fail to meet the needs of the farmers. In other words, farming system with the passage of time may not find the extension system of much use for their purpose. The vicious circle so evolved adversely affects research system, extension system and clientele system leading to the failure at all the fronts. Undoubtly, the clientele system would be hit the most. For want of solutions to problems, the yield per unit of land or per unit of livestock

will get reduced. This, in turn, will jeopardize the socio-economic development in rural areas. What is noteworthy here is the fact that rural development apart, it would be difficult to rejuvenate the aforementioned systems and improve their health so readily. To bring about required improvements competent staff both for research and extension, adequate funds, healthy organization and judicious decision-making will be needed besides strong political will.

From the corollary brought out above, it can be safely arrived at that linkages at every level in the process of technology transfer provide the structure and framework for research system, extension system and clientele system. Realizing this importance an in-built mechanism should be ingrained in the organization responsible for technology transfer not only for checking for weaknesses at every interactional level but also for providing remedial measures required for strengthening the linkages.

**2.4.1 Linkages in operation:** The HAU technology transfer model provides linkages for interaction at every level within and outside the university. Taking from top there is an Extension Education Advisory Committee (EEAC) which is a statutory body with the Vice-Chancellor of the university as its chairman. The Director of Extension Education as member secretary and the Deans of the Colleges and the Director of Research as other members. According to the Statutes (Act and Statutes,1987) EEAC has the following functions:

(i) The coordination of University Extension Education Programmes, with the state and national programmes,

(ii) the allocation of funds for extension education work, and

(iii) ways and means of increasing the effectiveness of university's extension education programmes.

**2.5 Duties, Powers and Responsibilities**

**2.5.1 Director of Extension Education:** According to the Act and Statutes of the university, the Director of Extension Education shall:

(i) Plan and execute all extension education programme and activities in cooperation with the Deans and the Director of Research,

(ii) The Director of Extension Education shall supervise and control the field activities of the extension subject-matter specialists who shall otherwise hold academic rank and be member of the staff of the departments, and

(iii) The Director of Extension Education shall have full access to the Vice-Chancellor and shall be directly responsible to him for effecting close collaboration and coordination of the extension education activities of the university with those of the Departments of Agriculture, Development, Cooperation and Animal Husbandry of the Government of Haryana.

The Director of Extension Education shall have the following powers and duties:

(i) He shall be responsible for initiation, organization and conduct of extension educational programmes of the university and for that purpose shall pass such orders as may be necessary in consultation with the Heads of Departments concerned.

(ii) He shall exercise broad administrative control over:

(a) Extension Education staff;

(b) Extension Education funds allotted for this purpose, and

(c) All physical properties, facilities and material assigned by the university for the pursuit of extension programmes.

(iii) He shall assess in consultation with the Heads of Departments, the budgetary needs of extension education of different departments of the university.

(iv) He shall be the principal liaison officer for dealing with such agencies as the Departments of Agriculture, Animal Husbandry, Cooperation, Development and Panchayats of the Government concerned in the matter of extension education.

(v) He shall formulate and present extension educational programme of the Extension Advisory Committee, for its consideration.

(vi) He shall guide and supervise the working of the Information Section dealing with publications, audio-visual aids, radio, press and other materials directed to the successful implementation of the extension educational programmes.

(vii) In formulating the extension policies and programmes of the university, he shall work in close consultation with the Deans of Colleges and Director of Research.

(viii) He shall assume leadership in the development and maintenance of effective and productive extension education programmes:

(a) Promotion of self improvement on the part of extension personnel; and

(b) inculcation in them of a missionary spirit for dedicated service to the farmers of the Haryana.

(ix) He may represent the university in conferences regarding Extension Education.

**2.5.2 Heads of Subject-Matter Departments:** The Head of the Department shall be responsible for resident teaching to the Dean of the College, for research to the Director of Research, for extension education to the Director of Extension Education, and for postgraduate teaching to the Dean, Postgraduate Studies of the University.

(i) He shall be responsible for the organization and conduct of resident teaching, research and extension education of his department and for that purpose shall pass such orders as may be necessary in consultation with the Deans/Directors.

(ii) He shall tender advice to the Deans and Directors on all matters pertaining to his field in respect of teaching, research and extension,

(iii) He shall submit to the Deans/Directors concerned the budgetary needs of his department.

(iv) He shall recommend to the appropriate Dean/Director the work load of each member of the staff with respect to teaching, research and/or extension eduation.

(v) He shall assume responsibility for all university properties and facilities assigned to his department.

(vi) He shall recommend to the Deans and Directors proposals for making improvement in the working of his department.

## 2.6 Qualifications of Director of Extension Education

The prescribed qualifications for the Director of Extension Education used to be Doctorate degree in Extension Education. However, these qualifications were changed and one of the Senior Professors or a person of equivalent rank in the university as may be found suitable for the post by a committee comprising, Vice-Chancellor, Director General ICAR and one outstanding scientist of National/International repute, may be appointed as Director of Extension Education with the approval of Board of Management of the University.

## 2.7 Organizational set up

The Director of Extension Education is assisted by Associate Director (Farm Advisory) for farm advisory work, Associate Director (Training) for training functions, Joint/ Associate Director (Extension) for farm information and communication work (Figure 2.1). For subject-matter support, the Director of Extension Education has a team of University-Level Extension Specialists in Agronomy, Farm Management, Entomology, Plant Pathology, Vegetable Crops, Soil Science, Agricultural Engineering, Horticulture, Veterinary Sciences, Animal Sciences, Poultry and Home Science. In each of these subject-matter areas, there is a District Extension Specialist posted in the 'Krishi Gyan Kendras' at each of the district headquarters in the State.

There were 12 'Krishi Gyan Kendras' stationed at district headquarters, namely, Ambala, Bhiwani, Gurgaon, Hisar, Jind, Karnal, Kurukshetra, Mohindergarh, Rohtak, Sirsa, Sonipat and Faridabad.

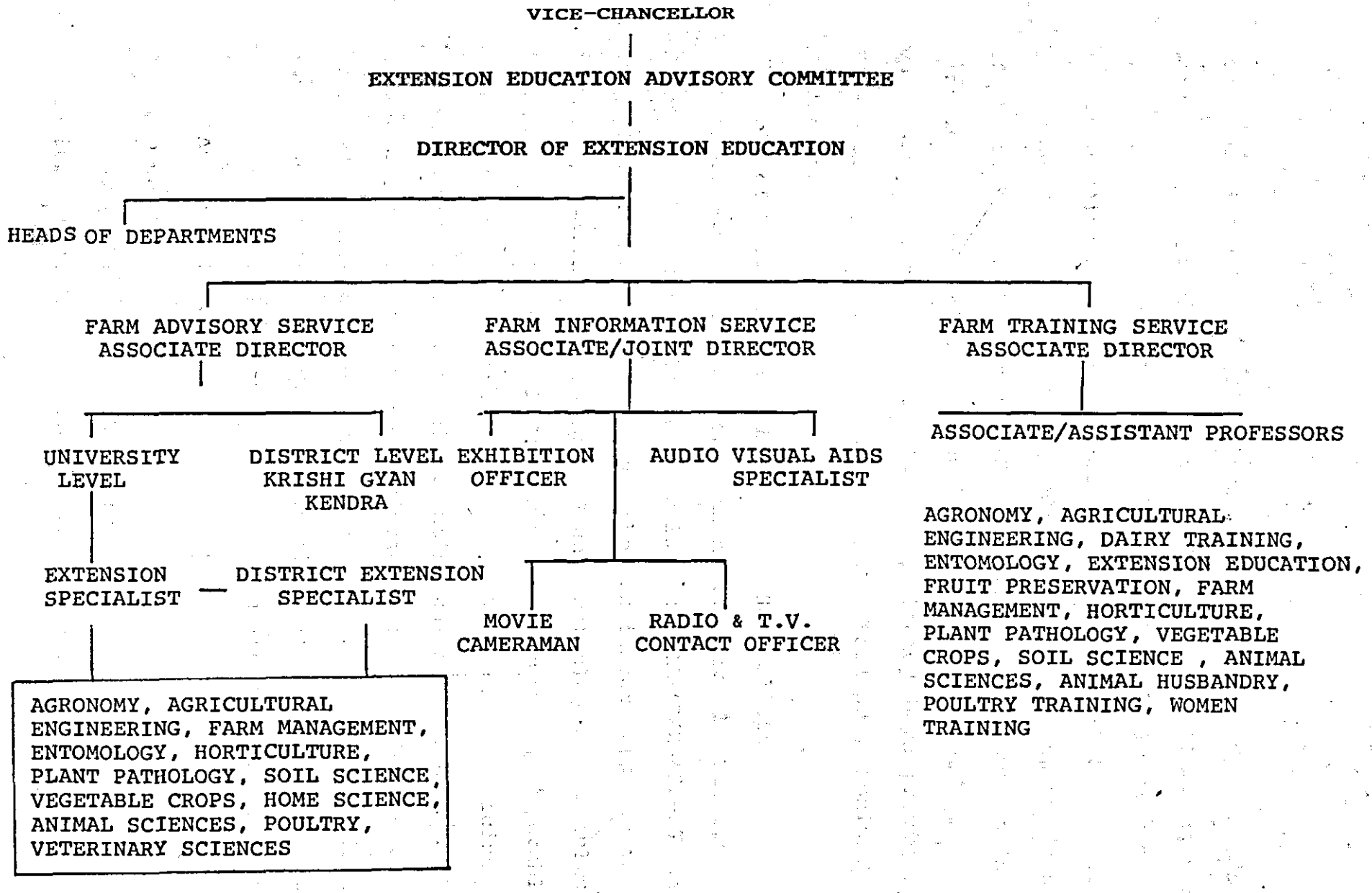



FIGURE 2.2. ORGANIZATIONAL SET UP OF DIRECTORATE OF EXTENSION EDUCATION

The State had 16 districts and the 'Krishi Gyan Kendras' were not yet provided at four of the district headquarters, viz., Kaithal, Yamuna Nagar, Panipat and Rewari. In view of the recent developments, 6 district headquarters will have 'Krishi Vigyan Kendras' (KVKs) with funding support of Indian Council of Agricultural Research (ICAR) besides Sadalpur in Hisar district. These Krishi Vigyan Kendras will have different set up as compared to KGKs. The KVKs had already been provided at Faridabad, Jind, Kaithal, Kurukshetra, Sadalpur, Sonipat and Yamuna Nagar.

**2.8 Role of University Level Extension Specialists**

Dr. J.C. Sharma, the then Additional Director of Extension Education vide a Circular No. EFH/S/23433-87 dated July 23, 1971, addressed to the Professor and Heads of Agronomy, Soils, Entomology, Plant Pathology, Agricultural Engineering, Agricultural Economics, Horticulture, Vegetables, Livestock Production and Management, Veterinary Medicine and Extension provided a note highlighting the role of ULESs, their time-use analysis and job descriptions prepared by him on the basis of discussions held with Assistant Extension Specialists (subsequently redesignated as District Extension Specialists), Extension Specialists and Heads of Departments from time to time (Appendix-II).

**2.9 Job Chart**

A publication entitled District Level Subject-Matter Extension Specialists' Job in the Farmers Advisory Service

Centres (Sharma and Sohoni, 1971) was brought out which contain job-charts for AESs of different disciplines. This publication provided detailed disciplines. This publication provided detailed information about the actual jobs to be carried by the District Extension Specialists. It also contained useful guidelines from the then Vice-Chancellor A.L. Fletcher and the Director of Extension Education Dr. J.C. Sharma. In addition, it also provided information about the different type of facilities available at Farm Advisory Service Centres.

**2.10 Need for Stronger Linkages**

To achieve the objectives of the transfer of technology for crop production, livestock and poultry production and other allied sciences as prescribed in the Act and Statutes of the University, very strong linkages have to be developed and these are also required to be reinforced and revitalized on continued basis. The process of the transfer of pertinent technology to the concerned clientele is a continuous process as more would be the development more would be the problems needing solutions. Hence, the generation of information, its transfer to the users, feedback of the problems and search and research for solutions is to go on for all the time to come. Stronger would be the linkages at various operational levels, better would be the transfer of technology. In other words, more valuable would be the generation of knowledge at research stations, more efficient would be the extension system both in

technology transfer and feedback, better would be the production per unit of land. The feedback from farmers would help solve in time the problems created by the new technologies in the field.

**2.11 Conceptualization and Setting of Variables**

All such factors which are known to have a bearing on the linkages between heads of departments, heads of departments and Directorate of Extension Education, heads of departments and extension specialists at the university campus and KGKs, extension personnel and farmers, the HAU and the State Department of Agriculture, etc., were included in the study. The basic theme was the functional interaction among different units or individuals who are directly or indirectly concerned with the transfer of technology. With emphasis on the fact that the percolation of information from the subject-matter departments to the concerned clientele takes place through the Directorate of Extension Education with optimum efficiency; and if need be the existing model for transfer of technology may be modified to ensure proper transfer of technology and feedback of problems to the concerned quarters for research. An endeavour has been made to conceptualize the variables on these lines. It was for this reason that all the concerned subject-matter departments, extension personnel and a sizable number of field functionaries and farmers from all over the State have been included in the study.

# CHAPTER - III

## REVIEW OF LITERATURE

This chapter carries the review of literature relevant to the research project in hand. No doubt, a lot of literature is available on transfer of technology and for this researcher it was a bit problematic as to which one of the information available in the literature should be cited and which one be ignored. However, on thorough review and screening of the literature, it was considered appropriate to present in this Chapter only those reports, observations, studies and recorded facts which were of immediate use to the researcher for the analysis of the linkages. The review of literature has been presented objective-wise under the following sub-heads:

3.1 Historical perspective of HAU technology transfer model

3.2 Interdepartmental linkages essential for reinforcing and revitalizing the technology transfer model

3.3 Adequacy of linkages for efficient feedback

3.4 Farmers' perception of technology transfer system

3.5 Suggestions for quick transfer of technology

### 3.1 Historical Perspective of HAU Technology Transfer Model

It is a well known fact that ever since the inception of the Haryana State on November 1, 1966, the agricultural production increased by more than three times and the

Directorate of Extension Education of the HAU is known have contributed immensely to the agricultural production besides playing a vital role in the overall improvement in the States' economy.

The Department of Extension Education at Hisar had its origin in the form of a Central Government Scheme of an 'Extension Wing' College of Veterinary and Animal Sciences sanctioned by the Government of India and included in the State plan for 1962 (Second Annual Report, 1963-64).

Fletcher (1971) reported that the HAU had placed more extension specialists in each district than any other Agricultural University in the country in the hope that the extension service rendered was the best in India. Recording about future prospects, the author said, "Every district will have a beautifully planned and equipped 'Farmers Advisory Service Centre', the like of which is not to be seen elsewhere in the country. It is also likely that for sometime to come Haryana would be the only State with such Centres".

Sharma (1972) observed that since the extension personnel were the university's ambassadors in the districts of their postings, they must have at least some knowledge of all parts of the university. This could be achieved if every year they were taken round different departments and colleges at the campus at least for one day a year. The occasions suggested in these paragraphs were in addition to seminars and training programmes specifically organized for extension personnel. If

these ideas were accepted in principle, more specific proposals could crystalize. The author further pointed out that the interaction between teachers, researchers and extensioners within a subejct-matter department was not adequate at present. So, was the interaction between different departments of a college and different colleges of the university. This led to isolationism which was not conducive to integrated and coordinated approach. Extension might not attract the best men. Any consequent failure in Extension exposes the university to the direct criticism by public. The situation, therefore, needed to be remedied. On the other hand, Extension was granted due recognition of being the most important facet; the fact remained that, it tended to receive much less attention as compared to teaching and research throughout the country.

Randhawa (1978) reported that only five or six Agricultural Universities could be said to have a vigorous and dynamic extension organization capable of undertaking effective extension education programme. The report mentioned that HAU's extension education network is most widespread and unique in the country. We recommend that wherever possible, Haryana pattern should be adapted. On the whole the agricultural unviersities have made substantial contribution in extension of knowledge of several new crop varieties and new crop practices, however, the system has several shortcomings. In several universities, the extension set up is extremely weak, without adequate staff and facilities".

Jones (1992) noted that Extension had a history of responding to the critical needs of society. During the last decade of this century, Extension will be challenged much more frequently to respond to broad societal needs. Expresssing his confidence, the author stated that Extension had the ability to respond effectively to the challenge.

### 3.2 Interdepartmental Linkages Essential for Reinforcing and Revitalizing the Technology Transfer Model

Lionberger and Chang (1970) reported that more the meaningful communication within and between the systems, faster would be the process of modernization of agriculture.

Jain (1970) attempted to study communication pattern and effectiveness of professionals performing linking roles in a research dissemination organization in U.S.A. The findings of the study lacked wider generality because linkers working in various kinds of research dissemination organizations were not included and the effectiveness of linkers was measured in terms of poor evaluation rather than a more objective measure.

Azad (1975) reported that agricultural universities started taking active part in agricultural extension and some of the universities, e.g., in Haryana, Punjab, etc., had appointed their subject-matter specialists to assist and help in the extension activities at the district and block levels. The agricultural universities also adopted areas or projects for the participation of their staff and students in extension activities.

Rao and Sohal (1978) observed that the job satisfaction was affected by various important factors like working conditions, recognition of their work, rewarding and promotional chances.

The Report of Review Committee on Agricultural Universities released by ICAR in June, 1978 stated that when the Directorate of Extension came up the link between the Department of Extension Education and the Directorate of Extension Education had become very weak in many universities and in some of the universities these two agencies were found to be working in isolation of each other to the detriment of the quality of extension education programmes. This meant that extension teaching had been completely away from the "field of extension programme" under the Director of Extension Education. The Committee pointed out that this was not a desirable feature. The Committee also noted that the extension education role of the agricultural universities should be three fold; that is, teaching in extension education, research in extension education and application of extension education.

In order to ensure the linkage between the Department of Extension Education and Directorate, it was recommended that Head of the Department of Extension Education mainly responsible for collegiate extension education and research should be designated as the Joint Director, Extension Education. While the teaching programme will function under the overall coordination of the concerned Dean, the Head of Extension Education department in his capacity as Joint

Director of Extension Education will also function under the Director of Extension and should be next only to the Director of Extension Education in the hierarchy of the Directorate.

Cheema (1978) observed that the ICAR should consider extension education as an important and legitimate role of the agricultural universities and provide adequate support in terms of funds and facilities for strengthening this function. The author further said that in order to look after policy formulation and implementation of programme in this area, ICAR should set up a separate cell for extension education and provide for the position of a separate Deputy Director General (Extension Education). It may be mentioned here that this did receive due attention of the ICAR.

Srinivas and Mukund (1980) pointed out that any useful result of research in the field of agriculture and food science must be carried to the village for practical application. Both the government and the agricultural universities had organized systems for propagating the new techniques in the villages.

Gupta (1983) reported that training had vast potential in the development of skills and utilization of farm technology for increased production. Therefore, training of extension personnel and farmers should be given due weightage in rural development programmes.

Prasad (1986) reported that the educational component of our extension system was extremely weak and we were giving messages without giving any rudiments of science in agriculture.

Verma (1987) reported that majority of extension personnel had moderate level of job satisfaction.

Rivera and Wheeler (1989) observed that system was always a part of large institutions and large process and, therefore, of large goal orientation. Extension was a component part, a system operating with other agro-support systems in the context of development, and more specifically for agricultural and technology development.

In his paper on 'Vision should direct Extension's mission' Walla (1992) has quoted Jones as accurate in reinforcing the view that extension professionals must be recognized as equal by their peers in academia.

Inaugurating the seminar on "Research and Development Linkages and Feedback in Agricultural Development" Jakhar (1993) urged agricultural scientists and extension workers to strengthen the information coordination work at the grass-root level.

Lenka (1993) said, "the draft agricultural policy resolution has identified evolving of location specific and economically viable technologies as one of the major challenges to the agricultural research establishment". The author identified the weaknesses in research and extension and emphasised upon transfer of technologies and adequate involvement of subject-matter specialists and training of field level workers who met the new extension challenges.

Chopra (1993) said that a clear delineation of work distribution among different agencies and proper coordination

would go a long way in making the new technologies available to the farmers. The feedback from the farmers would help solve in time the problems created by new technologies in the field.

**3.3 Adequacy of Linkages for Efficient Feedback**

Power et al.,(1960) reported that feedback maintained the stability and equilibrium of a communication system.

Dalal and Bakshi (1972) reported that the responsibility of agricultural extension work directly rested on the shoulders of Department of Agriculture. In order to strengthen its lower most unit, the Department prepared and published a job chart for Agricultural Inspectors.

Fletcher (1973) advocated for the need for a well planned, well equipped and well-staffed farmers advisory service centre at each district headquarters.

Jati and Dash (1974) reported that the training helped in building up definite skills and confidence among the extension workers and provided them new clues to take some of the intricate field problems in better ways.

Vidyarthy (1976) reported that agricultural universities should provide authentic information in systematic manner to extension agency at all levels. As extension was a process of extending research findings to the farmers, there needed to be a close liaison between those responsible for research work and those who extended research findings in the field.

Perumal and Rai (1978) reported that Agricultural Extension Officers were highly satisfied in regard to job security, cooperation from villagers, help and guidance from

officers, supervision of their work by their supervisors and cooperation from divisional level staff. But at the same time, they were highly dissatisfied as regards recognition given to their job in the block, frequent transfer of extension personnel, opportunity for further promotion, further education, dual control of supervision and lack of conveyance and other facilities for performing official duties.

Singh (1985) reported that transfer of technology was not merely a question of going to the farmers and telling them what to do. The extension workers should also listen to their problems, should also be able to advice them regarding resource of inputs and provide them with other related information.

Singh and Singh (1988) reported that training should be need-based and content should cover the technical problems faced by the extension agents in their field conditions and should provide a solution to their specific field problems.

Dangi and Intodia (1988) suggested that in training and visit system or in any other educational programme more emphasis should be given to the mixed media like lecture + chart + demonstration to make the teaching-learning process more effective.

Dakhore and Bhilegaonkar (1988) reported that proper training with sufficient infrastructural facilities will help to boost up their morale which led to better satisfaction and efficient performance on the job.

Babu and Sinha (1988) reported that mass media exposure of extension personnel was found to be significantly associated with their level of knowledge about technology. Thus, scientists in the nearest agricultural universities or research institutes should prepare special bulletin on latest technologies, which could be mailed periodically to the extension personnel of the region. Local stations of All India Radio and Doordarshan should give consideration for producing special programmes exclusively for extension personnel to equip them with modern farm technology.

Singh and Israel (1989) reported that the rate of adoption in case of contact farmers was found to be significantly higher than the non-contact farmers. There was a general feeling among both categories of farmers that inputs were not supplied in time on subsidized rates and Village Extension Officers did not stick to their visit schedule.

Hall (1992) reported that many extension workers seemed to have lost their common sense when it came to the advice they gave. They would not take the same advice if they were working on their own farms. They seemed to become robots, just simple channels for reproducing the messages. Unfortunately, many extension projects had focused on the transfer mechanism-concerned only with the efficiency of propagating the message, rather than whether the message made any sense to farmers. It was further reported that to come up with fixed package of technology was not only arrogant, but ignorant. The same technical package was often maintained year in, year out, and yet the ratio of output to input prices swung widely.

Harriman and Daugherty (1992) stated that extension's viability increasingly depended on programme accountability and research-based programming. Therefore, staff must further their skills in scientific investigation and programme evaluation.

Conone (1992) stated that if Extension was to be understood as one system, programming must be conceptualized in systemwide terms rather than by programme areas or disciplines.

Langone (1992) based on his experience of Georgia's Community Leadership Programme observed that Extension could be a catalyst for creating stronger linkages and problem-solving capabilities in rural areas.

Alzahrani (1992) reported that most important methods of transferring agricultural knowledge were the farm visits, demonstrations, extension meetings, and extension television programmes. Educational level and age had an impact on the utilization of different extension methods.

Alias (1992) observed that the success of any agricultural and rural development programme depended upon ability of extension workers to plan and execute them. Due to the varied nature of tasks expected to be performed by extension agents in-service trainings were indispensable. Hence, technical expertise among them needed to be constantly upgraded. The objective was to improve, upgrade and update their technical knowledge and capabilities. The technical support services should also be strengthened not only to provide technical back stopping to extension, but also to cater for services like seed and planting material production, processing and certification,

pest and disease monitoring and surveillance as well as soil survey and soil suitability studies.

### 3.4 Farmers' Perception of Technology Transfer System

Mathur (1970) observed that people did not adopt a new idea just soon after awareness. They might wait for several years to try it on their farmers and the final decision of farmers to use a new practice was usually the result of their knowledge of the practice and attitude towards it operating through time.

Motiramani (1976) noted that without extension education, the benefits of research results did not reach the farmers for whom the research was being done. Thus, research without extension was luxury. The author also observed that integration of teaching, research and extension education was an ideal and basic concept in the formation of agricultural universities.

Shete (1978) observed that organizationally the extension system served as a communication link between the research system and the farmers system. Extension Education System received new knowledge from the research system and after due processing and modifying, if necessary, passed it on to the farmers to make use of that knowledge.

Cernea (1981) reported that after a number of years when progress in extension had been rather trailing, the increased concern for poverty-oriented rural development strategies and for reaching large number of small farmers was again putting extension work to the forefront. The author further reported

that philosophy influenced the selection of the message extended to the farmers. What in this philosophy was most relevant for generating the system towards the rural poor was its almost exclusive stress, at least in the initial stages, on disseminating unsophisticated, low-cost improved practices.

Ali and Parameshwar (1981) observed that farmers training centre played an important role in creating awareness, motivation and interest among the farmers community about the new technology. It played a vital role and supplemented the efforts made by the government for increasing agricultural production.

Sethi et al., (1984) pointed out that education was the main factor responsible for influencing the knowledge of the farmers and knowledge of technology ultimately resulted in promoting the farmers' adoption of recommended practices irrespective of their economic standing and resourcefulness.

Unwin (1985) in his study on perceptions of farmers in Portugal concluded that many farmers were keen to implement changes in their farming practices if they considered them to be worthwhile.

Singh and Kaur (1986) reported that majority of farmers were aware of latest knowledge about sowing, harvesting, plant protection measures, multiple cropping, storing and marketing methods. Farmers paid visits to HAU Kisan Mela, Farm Darshan and procured pure seeds. The interest evinced by the farmers and the change brought about in farming system was obviously the result of university - run KGks advisory services.

Patil et al. (1987) reported that most of the farmers had proper perception or understanding of their expected roles except the role of convincing other farmers for adoption of improved technologies.

Dahama and Bhatnagar (1987) reported that communication must promote understanding through effective and free feedback so as to remove all barriers between the sender and the receiver.

Takate and Khot (1988) reported that training programmes for the farmers from the command areas may be organized to improve their knowledge.

Rangaiah and Reddy (1988) reported that education had positive and significant relationship with knowledge of farmers in respect of rabi and paddy crops.

Panjabi and Lakhera (1988) reported that socio-economic status was positively and significantly related with knowledge of wheat production technology.

Hall (1992) reported that farmer-to-farmer approach could be of good help in the dissemination of technology.

**3.5 Suggestions for Quick Transfer of Technology**

Sharma (1980) pleaded that for making the university's extension service optimally utilitarian, it was imperative to stimulate its popularity which would be achieved by increasing its acceptability. This necessitated some steps to enhance its respectability particularly at the district level.

The National Seminar on "Management of Agriculture and Rural Development Programme (IJEE, 1985)" recommended that (i) Planning of research and development in agriculture should be a joint endeavour of farmers, extension personnel and the scientists at the local and other levels to make the technology suitable for different farming situation and different categories of clients, (ii) Need for establishing Agro-Service Centres which deal with inputs, agricultural implements and machinery including their service and technical advice, (iii) One supply centre for providing inputs like seeds, fertilizers, pesticides, animal feed, veterinary medicine and raw material for rural industries for every village population of 5000, (iv) A bank containing technologies which were profitable, easily adoptable, socially compatible and suitable for local agro-climatic conditions, and (v) Need for enlarging the scope of district level planning and coordinating committees.

Parsad (1986) suggested that the role of extension set up in each university should be (i) teaching in extension education, (ii) research in extension education, and (iii) application of extension education. The author also reported in the field of extension the university should primarily confine itself to the knowledge input but every research scientists in the university should have contact with the field.

To make the technology transfer system more effective Nataraju et al., (1991) suggested that (i) audio-visual aids should be effectively utilized wherever possible and there should be proper mix practical and theory during training, (ii)

The National Seminar on "Management of Agriculture and Rural Development Programme (IJEE, 1985)" recommended that (i) Planning of research and development in agriculture should be a joint endeavour of farmers, extension personnel and the scientists at the local and other levels to make the technology suitable for different farming situation and different categories of clients, (ii) Need for establishing Agro-Service Centres which deal with inputs, agricultural implements and machinery including their service and technical advice, (iii) One supply centre for providing inputs like seeds, fertilizers, pesticides, animal feed, veterinary medicine and raw material for rural industries for every village population of 5000, (iv) A bank containing technologies which were profitable, easily adoptable, socially compatible and suitable for local agro-climatic conditions, and (v) Need for enlarging the scope of district level planning and coordinating committees.

Parsad (1986) suggested that the role of extension set up in each university should be (i) teaching in extension education, (ii) research in extension education, and (iii) application of extension education. The author also reported in the field of extension the university should primarily confine itself to the knowledge input but every research scientists in the university should have contact with the field.

To make the technology transfer system more effective Nataraju et al., (1991) suggested that (i) audio-visual aids should be effectively utilized wherever possible and there should be proper mix practical and theory during training, (ii)

to the linkage with other development departments, banks, input agencies and other organizations needs to be strengthened, (iii) the extension personnel be provided with vehicle for their quick mobility besides, (iv) a system of appreciation of good workers.

Gaydos (1992) suggested that extension educators should consider methods for reinforcing learning beyond the one-time programme.

In their paper on "Staffing Extension for the 21st century", Harriman and Daugherty (1992) pleaded that future Extension staffing patterns should reflect the difference between clients' needs for information versus education, and provide for a staff with skills, facilities and strategies to meet those needs effectively. Extension professionals must have or acquire expertise in communication and computer technologies. Along with high-tech skills, "high-touch" skills, interpersonal communication, and public relations will continue to be critical.

Based on the review of literature given above, it was considered inevitable to undertake a study on the analysis of linkages in a technology transfer model so as to develop a suitable strategy for reinforcing and revitalizing the linkages to ensure quick transfer of technology from research stations to the concerned clientele.

# CHAPTER IV

## METHODOLOGY

This chapter presents the methodological steps which guided the procedures adopted for the research project in hand. Since the research project besides exploring the historical perspectives of the 'HAU Technology Transfer Model' also included studies on the critical examination of the inter-departmental linkages essential for reinforcing and revitalizing the technology transfer model, adequacy of linkages for efficient feedback and the assessment of farmers' perception, the sources of data were different and varied. The procedural steps followed in this process have been presented under the following sub-heads:

4.1 Locale of the study

4.2 Sampling plan

4.3 Selection and measurement of variables

4.4 Construction of questionnaires and schedule

4.5 Pre-testing of questionnaires and schedule

4.6 Data collection

4.7 Other techniques used for data collection

4.8 Tabulation of data

4.9 Analytical procedures

4.10 Interpretation of data and report writing

## 4.1 Locale of the Study

This study was directed to undertake a critical analysis of linkages in the technology transfer model of HAU, which has been in operation ever since the institution came into being (February 2, 1970) and even earlier to that. While there existed a Directorate of Extension Education at the headquarters of the university campus at Hisar with 12 Krishi Gyan Kendras (including 5 KVKs) stationed at 12 district headquarters out of the 16 districts comprising the State, yet the subject-matter heads of departments of the constituent colleges of the university and other scientists in their respective departments were also concerned with the transfer of technology pertinent to the development of agriculture, animal husbandry and home science.

## 4.2 Sampling Plan

As indicated above, the nature of study demanded the collection of data/pertinent information from annual reports and literature, subject-matter HODs, ULESs, DESs, field functionaries of the Department of Agriculture, and farmers, different methods were adopted for selection of respondents from each of these categories as follows:

**4.2.1 Selection of Heads of Departments:** Keeping in view the needs of the study, it was inevitable to collect data from all the subject-matter HODs amenable to extension education, that is, transfer of technology from College of Agriculture,

College of Veterinary Sciences, College of Animal Sciences and College of Home Sciences. While from the College of Agriculture, the data were collected from 10 HODs which included the departments of Agricultural Economics, Agricultural Meterology, Agronomy, Entomology, Horticulture, Nematology, Plant Breeding, Plant Pathology, Soil Science and Vegetable Crops; from the College of Animal Sciences the data were collected from HODs, namely, Animal Nutrition and Livestock Production and Management; from the College of Veterinary Sciences the data were collected from HODs, namely, Veterinary Clinics, Veterinary Medicine, Veterinary Parasitology, and Surgery and Radiology and from the College of Home Sciences the data were collected from the HODs, namely, Extension Education and Foods and Nutrition. Accordingly, the data were collected from 18 HODs. To be of value and utility, the study needed factual information sans reservation of any type and keeping this in mind some of the prospective respondents where it was problematic to elucidate factual data were left out.

**4.2.2 Selection of University-Level Extension Specialists:** The responsibility of planning, formulating the programme and coordinating the extension education activities in each subject-matter area at the university level rests with the University Level Extension Specialists (ULESs). There existed ULESs in the disciplines of Agricultural Engineering, Agronomy, Animal Sciences, Entomology, Farm management, Home Science,

Horticulture, Plant Pathology, Poultry, Soil Science, Vegetable Crops and Veterinary Sciences.

Accordingly, there were 12 ULESs in the Directorate of Extension Education. Their number being well manageable, sampling was not done and all of them were included in the study. The data were collected from all the ULESs.

**4.2.3 Selection of District Extension Specialists:** A unique feature of the KGKs was to make available under one roof a team of specialists to farmers for advisory work at each of the district headquarters. There existed a total number of 144 DESs (including Coordinators) at KGKs. Of these, 31 posts of DESs were yet to be filled up and the total number of the ones in position was only 113. Further, even out of these 23 were on study leave, one on maternity leave and one was under suspension. Accordingly, there were only 88 DESs who were in position. The number of DESs was considered manageable for data collection by covering all the observational units of this group. However, of the 88 DESs operating at KGKs all over the State, the data could be collected from 84 of them (95.45%).

**4.2.4 Selection of Field Functionaries:** The major field functionaries of the Department of Agriculture constituted Agricultural Development Officers (ADOs), Circle Agricultural Officers (CAOs) and Subject-Matter Specialists (SMSs) who actually worked with the farmers at the grass-root level, and mainly shouldered the responsibilities for the transfer of technology to the farmers. There existed 1485 ADOs, 186 CAOs

and 147 SMSs in the Department of Agriculture, Government of Haryana. It was neither feasible nor desirable to include all of them in the study and sampling had to be done.

To ensure the coverage of a representative sample of the aforementioned officials in the study, from each of the agro-climatic sub-zone, that is, Bawal, Hisar, Karnal and Rohtak, 25 field functionaries from each of the zone were so selected randomly as to include 60 ADOs, 20 CAOs and 20 SMSs. Accordingly, the data were collected from a total number of 100 field functionaries.

**4.2.5 Selection of Farmers:** For selection of farmers, from each of the four agro-climatic sub-zones (indicated under 4.2.4) one district was randomly selected. Accordingly, Bhiwani, Hisar, Kurukshetra and Rohtak districts were selected. All of these district headquarters had a KGK. The data were collected from 25 farmers who happened to visit these KGKs during the period of stay of this researcher at these district headquarters. In this way, the data were collected from a total number of 100 farmers.

**4.3 Selection and Measurement of Variables**

The selection and measurement of variables included in the study is presented below:

**4.3.1 Technology Transfer Model in its Historical Perspective:** Historical perspective refers to the evolution of the technology transfer model ever since the inception of Punjab Agricultural University at its Hisar campus which subsequently

attained the status of an independent university/institution with the creation of Haryana Agricultural University on February 2, 1970.

The required information and data pertaining to the study of the university technology transfer model in its historical perspective were collected from annual reports of the concerned years, besides other records and verbal communication with the experienced officials who were in position during the concerned period.

**4.3.2 Linkages:** Linkages refer to the functional interaction and working collaboration between individuals working together to achieve common objectives or departments concerned with the implementation of extension education activities or programmes.

**4.3.3 Adequacy of Linkages:** It refers to the extent of functional interaction and working collaboration between individuals or departments within and or outside the university (State Department of Agriculture) concerned with the implementation of extension education activities or programmes.

**4.3.4 Reinforcement:** It refers to the redesigning and implementation of extension education programmes by the respective departments amenable to extension education.

**4.3.5 Revitalization:** It refers to strengthening of linkages at concerned levels, for quick transfer of technology based on latest advances in different disciplines.

**4.3.6 Variables Pertaining to Heads of Departments:** The operational definition and measurement techniques adopted for variables pertaining to the Heads of Departments (HODs) are given below:

**4.3.6.1 Trainings obtained:** It refers to the trainings obtained by HOD in Extension Education and that such a training would promote the individuals efficiency in implementing and monitoring the field extension activities. A schedule was developed for its measurement.

**4.3.6.2 Interest in Obtaining Training:** It refers to the interest of the individuals in obtaining training in Extension Education as and when an oupportunity arises. It was measured by direct questioning.

**4.3.6.3 Conceptualization of Extension Education:** It refers to the actual concept or understanding of the Extension Education. It was measured by direct questioning.

**4.3.6.4 Time Devoted to Extension Education Work:** It refers to the actual percentage of the total time for monitoring, supervising or guiding the field extension activities. It was measured with the help of a schedule.

**4.3.6.5 Participation in Extension Activities:** It refers to actual involvement of an HOD in extension activities, such as, demonstrations, trainings, group discussion and meeting with farmers, visits to KGKs, visits to farmers field, delivery of lectures in training programmes and other occasions, etc., besides publications which would help in the transfer of technology. It was measured with the help of a schedule.

**4.3.6.6 Weaknesses in Implementing Extension Education Programme:** It refers to all such weaknesses which would adversely affect the linkages in carrying out the extension education activities efficienctly.An open-end question was developed for this purpose.

**4.3.6.7 Administrative and Technical Control:** This refers to the sharing of the authority of control of ULESs between the Director of Extension Education and Head of Department. A schedule was developed for its measurement.

**4.3.6.8 Seating Arrangement of ULESs:** It refers to the opinion of an HOD about the seating arrangement for ULESs of his department. A schedule was developed for the measurement of this variable.

**4.3.6.9 Constraints:** It refers to the bottlenecks and impediments which weaken the linkages and roadblock the efficient performance of extension education programmes in the field.

**4.3.7 Variables Pertaining to ULESs:** The operational definition of variables pertaining to ULESs and the procedures adopted for their measurement were as follows:

**4.3.7.1 Field of Specialization:** It refers to the specific area of specialization within discipline at Master's and Doctorate level. It was measured by direct questioning.

**4.3.7.2 Experience:** It refers to the number of years an individual worked on a particular position and acquired working knowledge for carrying out routine jobs related to that

position. A structured question was developed for its measurement.

**4.3.7.3 Quantitative and Qualititative Changes:** Quantitative changes refer to the increase or decrease in the number of extension education activities over a specified period of time.

Qualititative changes refer to the improvement or otherwise in the quality of extension education activities organized over a specified period of time. It was measured by direct questioning with the help of an open-end question.

**4.3.7.4 Other Relevant Information:** To facilitate the study on the analysis of linkages pertaining to the ULESs, information was obtained on the following aspects:

(i) Number of days spent on tour,

(ii) Number of villages visited,

(iii) Number of letters received from farmers in a year,

(iv) Type of advice/feedback sought by farmers through correspondence,

(v) Steps followed in preparing the annual programme of work,

(vi) Collaboration obtained from other ULESs,

(vii) Utilization of one-third time,

(viii) Number of research and extension papers published,

(ix) Problems encountered in carrying out routine extension education work,

(x) Involvement in research work,

(xi) Satisfaction on extension job,

(xii) Professional support from the department,

(xiii) Intimation of farmers problems to the Subject-Matter Department

(xiv) Popularisation of research findings among farmers,

(xv) Training areas of interest,

(xvi) Help available from Training Wing and Farm Information and Communication Wings of the Directorate of Extension Education, and

(xvii) Facilities which need to be provided immediately.

The information on the variables given above was obtained through open-end questions and structured questions were listed in a questionnaire.

**4.3.8 Variables Pertaining to DESs/Coordinators:** In so far as DESs and Coordinators were concerned, the information was obtained on the following variables through a well structured questionnaire:

(i) Experience: As defined under 4.4.2.

(ii) Educational Qualifications: These refer to the academic qualification acquired through formal schooling in educational institutions and universities.

(iii) Trainings Obtained: It refers to the trainings obtained after graduation either during the service or before joining the service.

(iv) Number of farmers who paid office calls in a month,

(v) Number of days spent on tour to villages,

(vi) Mode of journey while on tour,

(vii) Supervision of work by seniors,

(viii) Collaborating agencies,

(ix) Farming problems intimated to seniors,

(x) Methods adopted for providing feedback to farmers,

(xi) Adequacy of library facilities,

(xii) Interest in obtaining training,

(xiii) Involvement in a research project,

(xiv) Steps followed in preparing the monthly and annual programmes of work,

(xv) Difficulties encountered in carrying out routine work, and

(xvi) Facilities demanded.

The information on the above mentioned variables where not mentioned was obtained through direct questioning with the help of an open-end questions, structured question or with the help of a schedule developed for the purpose.

**4.3.9 Variables Pertaining to Field Functionaries:** The information from ADOs, CAOs and SMSs was obtained on the following variables:

(i) Extension-oriented problems encountered,

(ii) Crop production problems intimated to seniors,

(iii) Help available from HAU for professional enrichment, and

(iv) Percolation of recommendations to field functionaries through the workshops.

The information on the above variables was obtained with the help of structured questions and or open-end questions.

**4.3.10 Variables Pertaining to Farmers:** The variables which would help in making an assessment of farmers' perception of the technology transfer system of the university and the procedure adopted for their measurement are described below:

**4.3.10.1 Perception:** Perception refers to the personal observations of a farmer based on his actual interaction with the DESs contacted by him during his visits to KGK which would ultimately develop his viewpoint about the functioning and utility of the services being imparted at KGKs for crop and livestock production. It was measured with the help of a series of questions contained in an interview schedule on the lines indicated hereunder.

**4.3.10.2 Age:** It refers to the chronological age of the respondents at the time of data collection was taken as the age of the respondents. It was measured by direct questioning.

**4.3.10.3 Education:** It refers to the formal schooling which a farmer had. It was measured by direct questioning.

**4.3.10.4 Land holding:** It refers to the size of land owned by a farmer. It was measured by direct questioning.

**4.3.10.5 Membership Status:** It specifies whether a farmer is an official member of an organization concerned with the development of village or any other political or social organization. It was measured by direct questioning.

**4.3.10.6 Visits Paid to KGKs:** It refers to the office calls paid by a farmer to KGK. A structured question was developed for the purpose.

**4.3.10.7 Source of Information:** It refers to the formal or informal soruces utilized by farmers for seeking information related to crop production. A structured question was developed for its measurement.

**4.3.10.8 Visit to University Campus:** It refers to the visit of the farmer to the university campus at Hisar either at his own level or through an intermediary on occasions like Kisan Mela, Farm Darshan or for participating in Training Programmes or for other purposes. It was measured with the help of a structured question.

**4.3.10.9 Help available from KGKs:** It was measured with the help of an open-end question.

**4.3.10.10 Problems encountered:** These refer to the problems encountered by farmers in utilizing the services being provided to them through KGKs. It was measured with the help of an open-end question.

**4.3.10.11 Membership of Haryana Kheti:** It refers to subscribing for 'Haryana Kheti' on annual basis. It was measured with the help of structured questions.

**4.3.10.12 Facilities required:** These refer to all those aspects of farm advisory service which would go to make it still more useful for the farmers and make them to avail these on continued basis for crop and livestock production and other allied aspects on scientific lines. It was measured with the help of an open-end question.

**4.4 Construction of Questionnaires and Schedule**

In the light of the objectives of the study open-end questions, structured questions and schedule were developed for each category of the respondents. Accordingly, four separate questionnaires were constructed for HODs, ULESs, DESs and field

functionaries of Department of Agriculture. An interview schedule was constructed on the same line for farmers.

**4.5 Pre-testing of Questionnaires and Schedule**

The interview schedule developed for collection of required information from farmers and the four questionnaires meant for HODs, ULESs, DESs and the field functionaries of Department of Agriculture were subjected to pre-testing before finalization.

**4.5.1 Questionnaires:** Since questionnaires were developed for three categories of extension personnel besides heads of departments. There were four questionnaires which were to be pre-tested. Each of these questionnaire was pre-tested. In case of HODs, the questionnaire was pre-tested on five former HODs in the College of Agriculture. Likewise, the questionnaire for ULESs was pre-tested on five former ULESs who were now working on the teaching and research sides. The questionnaire meant for DESs was pre-tested on 10 former DESs who were now working in departments at the university. To pre-test the questionnaire developed for field functionaries of the Department of Agriculture, it was administered to 20 field functionaries working in Hisar and Jind districts. These comprised ADOs, CAOs and SMSs. Based on these pre-tests, the questionnaires were appropriately modified, wherever so desired (Appendices III, IV, V and VI).

**4.5.2 Interview Schedule:** The interview schedule was pre-tested on 30 randomly selected farmers of Kirtan and Kinana villages falling in the vicinity of Hisar and Jind districts

respectively. The farmers on whom the schedule was tested were known to be visiting KGKs. On the basis of this pre-testing, the schedule was accordingly modified (Appendix VII).

**4.6 Data Collection**

The data were to be collected from five categories of the respondents which included HODs in the Colleges of Agriculture, Veterinary Sciences, Animal Sciences and Home Sciences, all the ULESs and DESs all over the Haryana State, 100 field functionaries of Department of Agriculture and 100 farmers. The data collection was done from July, 1992 to October, 1992.

**4.6.1 Data Collection from HODs:** This researcher approached each HOD amenable to extension education in person alongwith a letter from the major advisor and requested him to provide the required infomation on the questionnaire which was specially prepared for the purpose. They were requested to provide information as objectively as possible so that quality research on the analysis of linkages could be possible. The duly completed questionnaires were received from all the HODs within a period of one month.

**4.6.2 Data Collection from ULESs:** The ULESs were approached in person by the researcher and a questionnaire alongwith a letter from the major advisor was handed over to them. To facilitate the obtaining of information from them on the lines it was needed, a brief discussion was held with them and their queries were answered in consultation with the major advisor. All of them returned the duly completed questionnaire within a period of 4-6 weeks.

**4.6.3 Data Collection from DESs:** The researcher visited all the 12 KGKs in the State where a meeting was held with the DESs alongwith the Coordinator of the KGK. A set of questionnaire was handed over to each of the DESs and the Coordinator was requested to collect the completed questionnaires from all the DESs of his KGK and mail the same to the major advisor as early as possible. While the completed questionnaires from some of the KGKs were received quite promptly, in some cases these could be obtained only after personal efforts of the Director of Extension Education who sent reminders to Coordinators. However, the data from 84 DESs out of 88 in position were collected in a period of about 10-12 weeks.

**4.6.4 Data Collection from Field Functionaries of Department of Agriculture:** The field functionaries were approached by the researcher in their fortnightly meetings organised by Deputy Directors Agriculture (DDAs) in their offices at the district headquarters. In the first instance, the DDAs introduced this researcher to the field functionaries and explained to them the purpose of collecting the information through a questionnaire. Before handing over the questionnaire, the researcher told to the respondents the method for filling up the questionnaire and that they should feel free in providing the required information which would be kept confidential. All the field functionaries present in the meeting completed the questionnaire then and there.

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**4.6.5 Data Collection from Farmers:** The data were collected with the help of specifically structured interview schedule. Before approaching the farmers for the actual task, sufficient rapport was developed with them. The respondents were interviewed personally and individually and the interview was conducted at the KGKs. To obtain still more information from the farmers, a brief discussion on their perception of the technology transfer system of the HAU was held with them and the important points were noted down in diary.

**4.7 Other Techniques Used for Data Collection**

The nature of the study being quite intensive, the researcher held informal discussions with all types of respondents covered by this study so as to have an indepth information about the linkages and that how and in what way these linkages could be strengthened. As and when some useful information emerged from the discussions it was recorded in the dairy for use at appropriate time.

When the respondents (in each case) were found having an informal discussion among themselves on related topics, this researcher without showing interest in their discussion listened to the same carefully and noted down the useful information subequently.

**4.8 Tabulation of Data**

The tabulation was carried out as soon as the data were collected. The responses to each of the questions contained in the questionnaires and interview schedule were first separately

tabulated and then frequencies were worked out. Subsequently, appropriate tables were formulated depending on the type of information required for the purpose of the study. These tables were then arranged section-wise.

**4.9 Analytical Procedures**

The percentages and ranges were calculated for the purpose of interpretation and inferences of relevant data in the light of the objectives of the study.

**4.10 Interpretation of Data and Report Writing**

The data were interpreted and inferences were drawn with due support from relevant literature. A report was prepared in the form of a thesis.

# CHAPTER V

## RESULT AND DISCUSSION

This chapter deals with the results and discussion. The results and discussion have been presented under the following heads:

5.1 Technology Transfer Model in Historical Perspective

5.2 Interdepartmental Linkages Essential for Reinforcing and Revitalizing the Technology Transfer Model

5.3 Adequacy of Linkages Within and Outside the University for Efficient Feedback

5.4 Farmers' Perception of the Technology Transfer System of the University

## SECTION 1

### 5.1 Technology Transfer Model in Historical Perspective

This Section presents the relevant information concerning the university technology transfer model in its historical perspective.

The First Annual Report (1962-63) makes a mention of The Punjab Agricultural University Act, 1961. The main features of this act included "undertaking the extension of agricultural and other allied sciences to the rural people of the State".

The Act further stated that "In the field of Extension Education, the University is responsible for the Agricultural Extension function in the State which are primarily educational in nature. The Act also states that university shall be responsible for imparting training to the future Extension

Officers for National Extension Blocks and Instructors for the Extension Training Centre. The Director of Extension Education (DEE) has been made responsible for drawing up all Extension Educational Programmes."

"Realizing the need for creating a suitable agency of trained extension personnel for taking the research findings from the Agricultural Research Stations to the fields of the cultivators, the Agricultural Administration Committee set up by the Government of India (Nalagarh Committee) made specific recommendations in this behalf. As a result, schemes on the Farm Advisory Service (both for hills and plains) were started during the year 1961-62 with a provision for employing Subject-Matter Specialists (SMSs) in four subjects, namely, Agronomy, Horticulture, Plant Protection and Soil Science at the headquarters of most of the districts. On these posts, the Department of Agriculture appointed the senior most Agricultural Inspectors available in the subjects. Similarly, under the scheme, "The Implementation of the Recommendations of Agricultural Administration Committee Part-II - Employment of Extension Specialists", three subject-matter specialists in P.A.S. Class I and one in P.A.S. II were appointed during 1961-62 in the four subjects of Agronomy, Horticulture, Plant Protection and Soil Science. No specific programme was chalked out for this staff and there was no proper coordination between the District Subject-Matter Specialists and the State Level Subject-Matter Specialists. The District-Level Subject-Matter Specialists remained attached to the District Agricultural

Officers and the State-Level Subject-Matter Specialists remained divided at Chandigarh and Ludhiana without any established working relationship between them.

Soon after his appointment under the Punjab Agricultural University (PAU), the DEE established the required working relationship between the State-level and the district-level SMSs. He chalked out a comprehensive programme of Extension Education in consultation with the Additional Director of Agriculture, Punjab. This programme envisaged concerted, cooperative and continuous efforts on the part of the PAU, the Department of Agriculture and the Community Development Department. Accordingly, copies of this Extension programme were circulated to all the District Agricultural Officers, Block Development and Panchayat Officers and the Subject-Matter Specialists all over the State. According to this programme stress was laid on imparting up-to-date training to the inservice staff and the College of Agriculture, Ludhiana and to farmers, at the District Agricultural Farms, and to set up all over the State a chain of Demonstration Centres comprising the entire family holdings of selected land-owners.

The Second Annual Report of PAU (1963-64) recorded that the extension training and advisory activities of the university aroused great interest among the farming community as aimed by pressing demands received from all over the State for enhancing facilities for the dissemination of knowledge on improved agricultural practices. In response to this, training

camps for farmers were arranged at the different district headquarters twice during the year, August-September and February-March, constituting agriculturally slack seasons, to provide them with practical and technical knowledge for application in the following crop season.

During the year 1963-64 a provision of four State-level Extension Specialists in Agronomy, Horticulture, Plant Protection and Soil Science was made and they were stationed at the University campus. Four Assistant Extension Specialists (AESs) in these very subject-matter areas, were provided at every district headquarters of the State. They received technical guidance from their State-level University Extension Specialists in their respective fields but were closely linked with the District Agricultural Organization for their day-to-day extension operations. The extension education activities were carried out by the Extension Specialists in the fields of Agronomy, Horticulture, Plant Protection and Soil Science in the State.

**5.1.1 Extension Wing at Hisar:** The "Extension Wing" at Hisar started functioning during the year 1964-65 and in spite of inadequate staff it made a good start by organising progressive farmers' meetings, farmers' day, simplyfying nomenclature for farmers, demonstrations on fodder crops, debeaking of chicks, training programmes for Animal Husbandry Extension Officers, poultry farmers and administrative officers, etc. Muklan village was adopted for providing First-aid for farmers' livestock once a week at their doorsteps by the Post-Graduate

Extension students visiting neighbouring villages in connection with their villages practicals (Third Annual Report, 1964-65).

During the year 1965-66, an effective working relationship was developed with the CD & NES Block Hisar to facilitate transmittal of scientific agricultural knowhow of the university to the farmers through its Extension Department. Besides developing a field for extension work in villages, a live laboratory came up for conducting extension practical for students and trainees under rural conditions, demonstrations, farmers meetings and the first ever Kisan Mela were organised besides several other activities (Fourth Annual Report, 1965-66).

A new dimension was added to the Extension Department during the year 1966-67, in the form of Junior Staff School for strengthening the training activities for farmers as well as field staff of government departments concerned with agricultural and rural development. During this year a number of training programmes were organised. These included refresher training for Animal Husbandry Extension Officers, poultry farming training, pig keeping training, orientation training for American Peace Corps, agricultural production training besides several other training programmes. The Extension activities included demonstration, farmers' training, farm and home visits, conducted tour of farmers, applied nutrition programme, rural youth work, improved seed distribution, Kisan Mela, Farm Darshan, Grape week, etc. (Fifth Annual Report, 1966-67).

The Annual Reports for the years 1967-68, 1968-69 and 1969-70 suggested year to year increase in the extension activities for different categories of clientele. On the one hand, there was quantitative increase in different activities organised for the promotion of Agronomy, Horticulture, Plant Protection, Soil Science, Farm Management, Veterinary and Animal Sciences, there was qualitative improvement in the activities which appeared self-explanatory because of the increase in trend of the activities on the demand and interest shown by the farmers.

**5.1.2 HAU A Source of Inspiration:** Before the HAU came into being (February 2, 1970), the Annual Report (upto Ist February, 1970) has recorded that "the Hisar campus of the University has now became a source of inspiration to great majority of farmers and others connected with the development of agriculture and animal husbandry. Besides Haryana, farmers from several other states, viz., Rajasthan, Uttar Pradesh, Delhi, Bihar, Jammu and Kashmir, etc., have also started looking to this campus as the fountain head of information on farming. Seventeen training programmes were organised which were attended by 225 farmers, rural and urban women of Haryana and 360 government officials of the Haryana State. For farmers, the trainings were conducted on tractor maintenance, pruning of grapevines, poultry keeping, human nutrition and cooking of food in a scientific way, fruit and vegetable preservation besides young farmers training government officials which included extension staff, school teachers, gram sevaks and panchayat secretaries of Applied

Nutrition Programme (ANP) Blocks of Haryana, Gram Sevikas of ANP Blocks, Block Development and Panchayat Officers, Agriculture Inspectors, Village Level Workers and Agricultural Sub-Inspectors were imparted training in plant protection, ANP, and Rabi Crop Production, respectively.

The popularity of 'Haryana Kheti' a monthly magazine devoted to agriculture greatly increased. The number of subscribers increased from 396 (June, 1969) to 1041 during the period. Other activities organized included Farm Darshan, film shows, conducted tours, farmers meetings, demonstration, office calls, kitchen gardeners' clubs, advisory correspondence, farmers directory besides veterinary extension work. In comparison to the previous year, the number of farmers participating in each of the activities was found to be on the higher side.

**5.1.3 Technology Transfer after the Inception of HAU:** According to the 'First Annual Report' after the inception of HAU (February 2, 1970 to 30th June, 1972), interestingly the period "saw the planning of an extension education service, the kind of which did not exist elsewhere in the country (Figures 5.1 and 5.2).

The Vice-Chancellor, A.L. Fletcher, I.C.S. (Retired) soon after HAU was born, prepared an exhaustive questionnaire to find out that already existed and what was immediately needed to be created, keeping in view not only the present inadequacies, but the future needs of a growing, dynamic

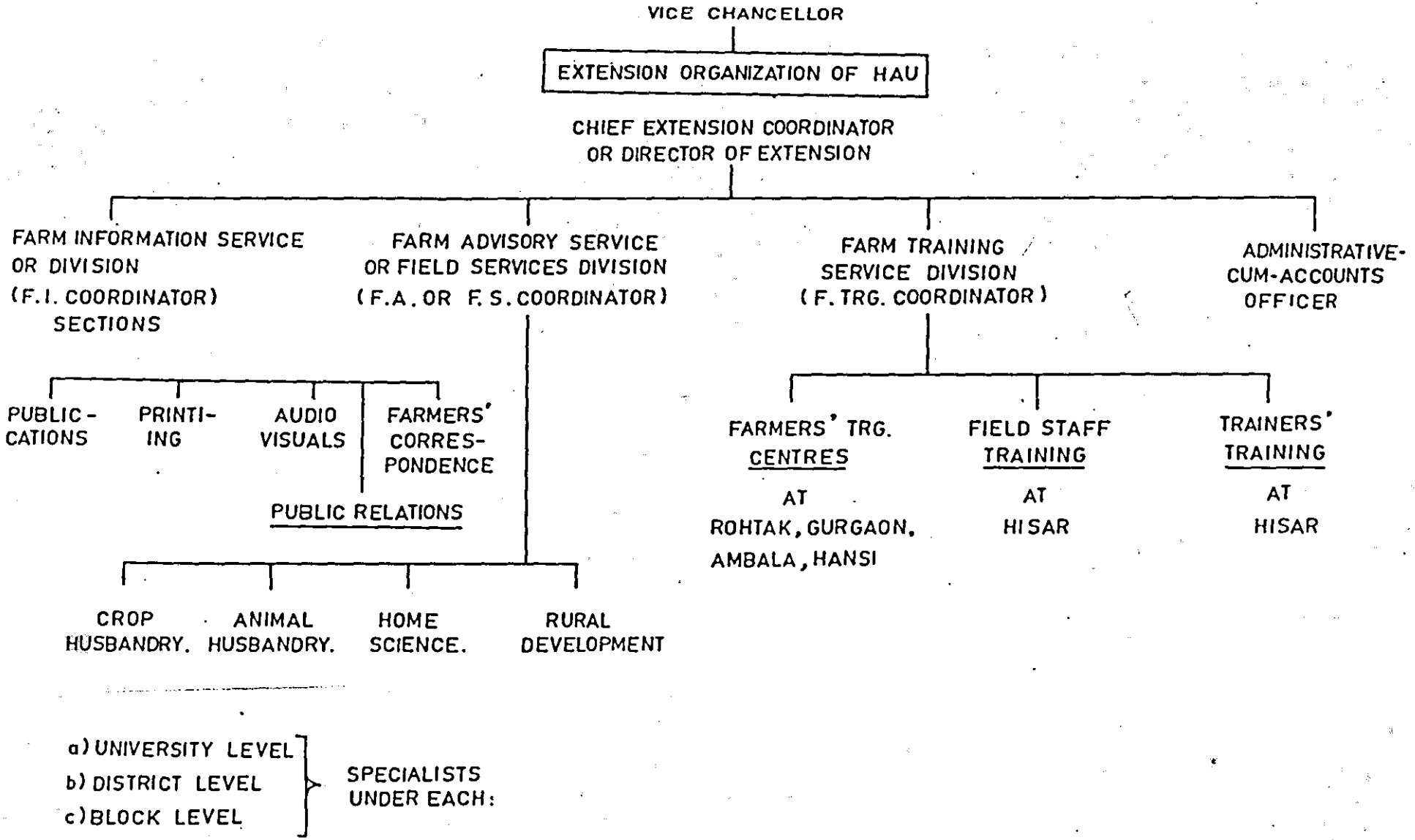



FIGURE 5·1 A SUGGESTIVE ORGANIZATION CHART FOR EXTENSION SERVICES OF HAU, HISAR. 13·6·70

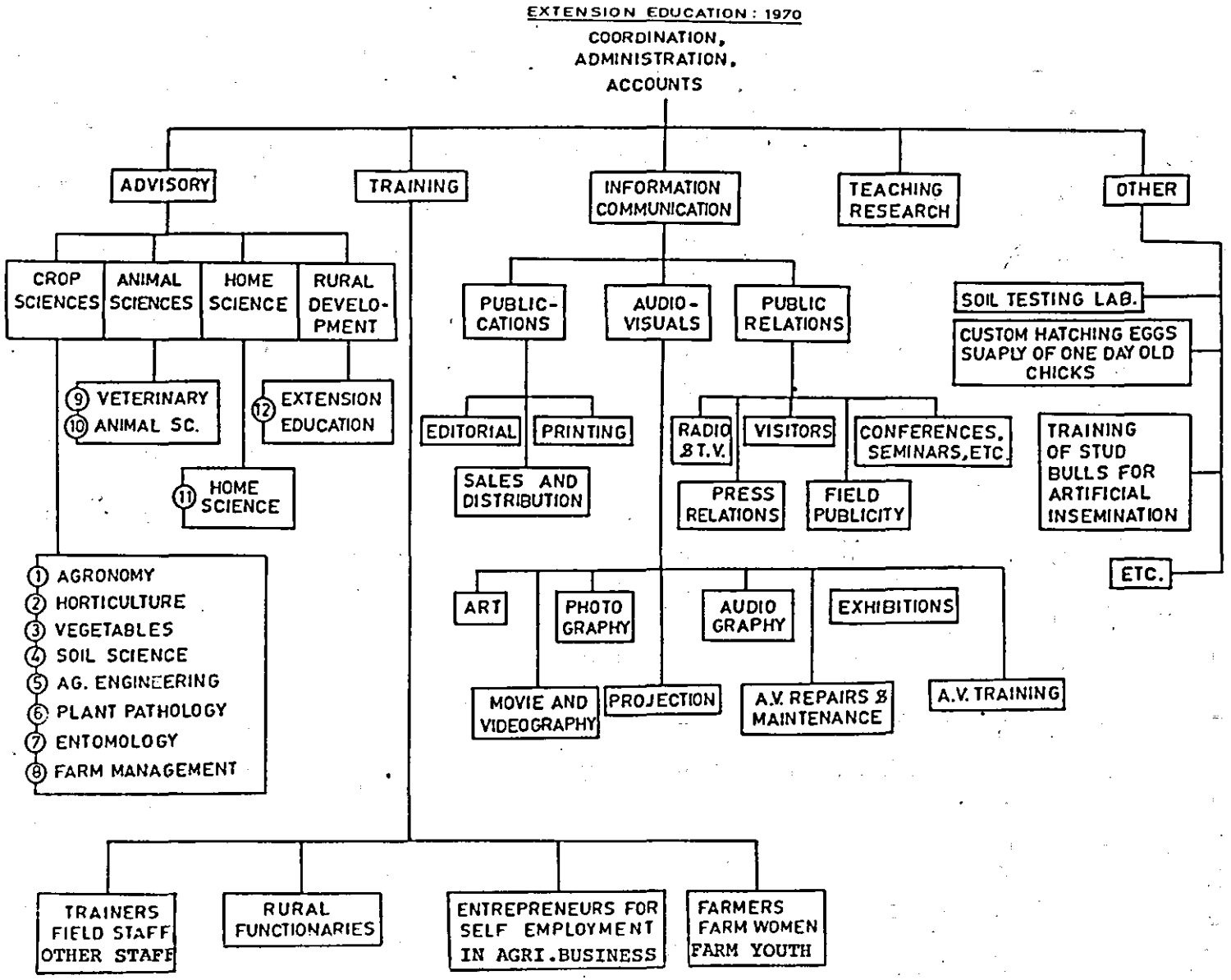



FIGURE 5.2. EXTENSION EDUCATION 1970 : COORDINATION, ADMINISTRATION AND ACCOUNTS
(by Dr. J.C.SHARMA)

extension education programme. The then Additional Director of Extension Education, Dr. J.C. Sharma, the report says provided this information on a very austere scale based on what was proposed for the 'Fourth Plan' when Hisar was still a campus of the PAU. This was, naturally, considered inadequate in the matter of buildings and what the Vice-Chancellor sanctioned was, therefore, much more than was demanded. Another progressive step taken by the Vice-Chancellor was to pool all extension education schemes-big and small-under one major budget head".

**5.1.3.1 Outstanding proposals:** Noteworthy among the proposals and projects approved by the Vice-Chancellor:

(i) The Extension Education Complex at the Hisar Campus, which will be knwon as Gandhi Bhawan.

(ii) The Farmers' Advisory Service Centres at district headquarters.

(iii) The Farmers' Hostel.

(iv) Additions and alterations to the existing Kisan Ashram.

(v) Hostel for Women Trainees, and

(vi) A Model Village at the Hisar Campus.

All these were considered very essential as basic facilities for the efficient functioning of a dynamic extension education service, which aimed at taking the knowledge of modern agricultural technology to the doorstep of every farmer. Still, since facilities of this kind and magnitude were almost

non-existent elsewhere, it needed the imagination and boldness of Mr. Fletcher to visualise these requirements and plan for them on a scale and pattern unprecedented in the history of extension education in the country.

As a follow-up, the Vice-Chancellor constituted a Committee in June, 1970, with ADEE as Convener, to plan the details of the 'Extension Education Complex'. The committee met on July 10, 1970. The report submitted by it was commended by the Vice-Chancellor as exemplary. This complex which was named after Mahatma Gandhi who had dedicated his life to the service of the people, was intended to house the entire Directorate of Extension Education, providing under one roof, all the information and facilities needed for farmers, and, thus, attract them in larger number to the University, provide them with greater satisfaction. This Gandhi Bhawan comprised:

(i) Offices of the Directorate of Extension Education, Extension Specialists and supporting staff;

(ii) The Agricultural Information Centre;

(iii) The University Press;

(iv) A permanent exhibition of the Development of Agriculture from earliest times to the present day;

(v) An exhibition to portray the progress of Haryana;

(vi) A display of latest farm machinery and implements;

(vii) A hall for seminars and symposia;

(viii) Studies for photography and workshops for the making of audio-visual aids;

(ix) Farmers' waiting halls and reading rooms.

**5.1.3.2 Krishi Gyan kendras:** The Farmers Advisory Service Centres at the district headquarters was to be the mini

replicas of the 'Gandhi Bhawan' to provide a composite service to farmers at district level. The first to be constructed were at Hisar and Gurgaon. The centre at Hisar was opened by the Vice-Chancellor on 12th June, 1972. The centre at Hisar provided:

(i) Office facilities for nine district level extension specialists, of whom eight were in position and for four additional specialists of the National Demonstration Scheme, and for the Co-ordinator;

(ii) An exhibition hall in the latest technical knowhow on crops, livestock and rural development will be on display in the form of audio-visuals;

(iii) A reception lobby with a reception counter;

(iv) Separate waiting-cum-reading rooms for men and women farmers;

(v) A uniquely designed seminar hall on the terrace for meetings of large groups of farmers.

The Centres at other district headquarters were to have, besides the above facilities:

(i) A lecture theatre or auditorium for holding training programmes, seminars, etc.;

(ii) A Soil Testing Laboratory;

(iii) A Disease Investigation Laboratory;

(iv) A poultry development unit;

(v) A vegetable crops unit.

The Centre at Karnal was also have a 'Parasitology Research laboratory'.

Additions and alterations in the existing 'Kisan Ashram' were done and construction of a new Farmers' Hostel was completed in order to make it possible to increase the number and quality of trainings as well as of trainees.

A measure of the importance that the Vice-chancellor attached to the Extension Education Programme was the fact that he himself presided over the Selection Committee even for the posts of Assistant Extension Specialists in various subjects.

**5.1.4 Quantitative and Qualitative Developments:** For obvious reasons the period under report proved to be mainly one of planning and spade-work though there were some significant addition to the routine which had been established even before HAU came into being. There have been the usual Kisan Melas, the Agricultural Officers' Workshops and such annual publications as the 'Agricultural Officers' Handbook', and 'Package of Practices' for Rabi, Kharif, etc. There was a significant improvement in the training programmes for farmers, both quantitatively and qualitatively. A Hindi monthly 'Haryana Kheti', started in June, 1969 was becoming increasingly popular and useful. An English version of the same, 'Haryana Farming' was started in March, 1972. A recent issue of these Magazines was devoted specially to the problem of tackling soil salinity. 'Tips to Vets', a new kind of monthly publication which, in essence, was a correspondence programme for continuing education of the veterinarians in the field, to enable them to keep abreast of the latest techniques applicable to practical field situations, each monthly bulletin dealing with one specific problem confronting the vets. Then there were the 'National Demonstrations' in Haryana, for which this Directorate had assumed responsibility and in which it had

significant achievements. The discussions at the 'All-India Workshop on National Demonstration' held here in April, 1972, revealed that in the matter of linking 'National Demonstrations with Farmers' Training Programmes', the level of coordination in this State was better than in other parts of the country. There were as many as 16 farmers training camps on the sites of such demonstrations, which were attended by a total of 1916 farmers.

**5.1.5 Teething Problems:** There were certain temporary inadequacies and inconveniences which were inevitable when a new university was coming up. First, there was problem of office accommodation. Initially, we had to be adjusted in the College of Agriculture. Now a part of the office was in one wing of the veterinary hostel and a part in the Kisan Ashram. The Press was unable to expand because the improvised accommodation in the Kisan Ashram was much too small. Then it took time to recruit men of the right kind and calibre. When the building programme was completed it was expected to have, perhaps, the finest Extension Education Complex in the country and the stage would be set for a really dynamic programme of extension education.

**5.1.6 Functions of Directorate of Extension Education:** The work of the Directorate of Extension Education fell broadly under three heads:

(i) Farm Advisory Service

(ii) Training Service

(iii) Agricultural Information Service

There was bound to be a good deal of overlapping because it was not possible to divide these activities into watertight compartments. Besides there were certain activities which could not be specifically classified as advisory, training or information service, because they involved all the three and something more also. Such, for instance, were National Demonstrations, the Kisan Melas, the Agricultural Officers' Workshops, etc. Accordingly, in the annual report the material regarding the activities of the Directorate have been presented under the following heads:

(i) Farm Advisory Service

(ii) Training Service

(iii) Agricultural Information Service

(iv) National Demonstrations

(v) Miscellaneous

(vi) Contributions by Departments of the University

**5.1.6.1 Farmers Advisory Service (FAS):** Being the field arms of the University Extension Education Services, FAS was vitally important. The impact that the university was to make in the field depended primarily on the efficiency and effectiveness of the FAS. Punjab and Haryana being the pioneer States having started the FAS under the agricultural universities, the rest of the country was watching their performance with interest, as was revealed by enquiries and queries being received. For these reasons, it was this service which deserved careful attention, planning and implementation.

FAS in Haryana, as inherited from the Punjab Agricultural University at the time of bifurcation was inadequately staffed, ill-housed, ill-equipped and lacked proper direction. During the period under report, due attention was paid to all these shortcomings.

**Staff:** Firstly, the pay scales of the specialists and their status were raised with a view to attracting the best available personnel.

Secondly, their number in each district was raised to 8 from the earlier four. To the already existing team of Assistant Extension Specialists in Agronomy, Horticulture, Plant Protection and Soil Science, AESs in Farm Management, Agricultural Engineering, Animal Science and Veterinary Medicine were added. This was with a view to making the team a composite one so that farmers could seek solutions to all their problems - whether pertaining to crops or livestock under one roof. However, a provision was made that a ninth Assistant Extension Sepcialist for Home Science may be added after the Home Science College get established.

Thirdly, all the 4 University-Level Extension Specialists in Agronomy, Soil Science, Horticulture and Entomology were left at Ludhiana. None came to the share of Haryana. Steps were, therefore, taken to put a whole team in position anew at the university headquarters. Twelve posts of Extension Specialists were created.

Past practice was to accommodate the HAU's district level specialists in the office of the concerned District Agricultural Officer (DAO) which itself was generally a rented building. Where the DAO could not accommodate these specialists, HAU hired a building for their office. With the expansion of the DAO's own staff, the AESs could not be accommodated by most of them.

Having found the arrangements far from satisfactory, particularly from farmers' standpoint, the university took a bold decision to construct its own buildings for its FAS centres in each district.

**5.1.7 Job Description of Specialists:** An attempt was made to define the role of the University-Level Extension Specialist and a job chart for each was prepared. Rather than a haphazard touring, systematic tour schedules were drawn up so that each University-Level Extension Specialist visits each district and at regular intervals.

Perhaps even more important was the Job Description of each category of AESs. For this purpose, a 'Job Book' was prepared by Dr. J.C. Sharma, the then ADEE and A.W. Sohoni towards the end of 1971. It listed in detail the tasks that were common to all category of AESs, the tasks to be performed by the AES (SM), AESs in 8 different subject-matters (Figure 5.3) (In the absence of any coordinating official of the University at the district headquarters, the seniormost among the AESs performed the coordination functions). On the one hand, these job charts clearly, distinguished the task of one

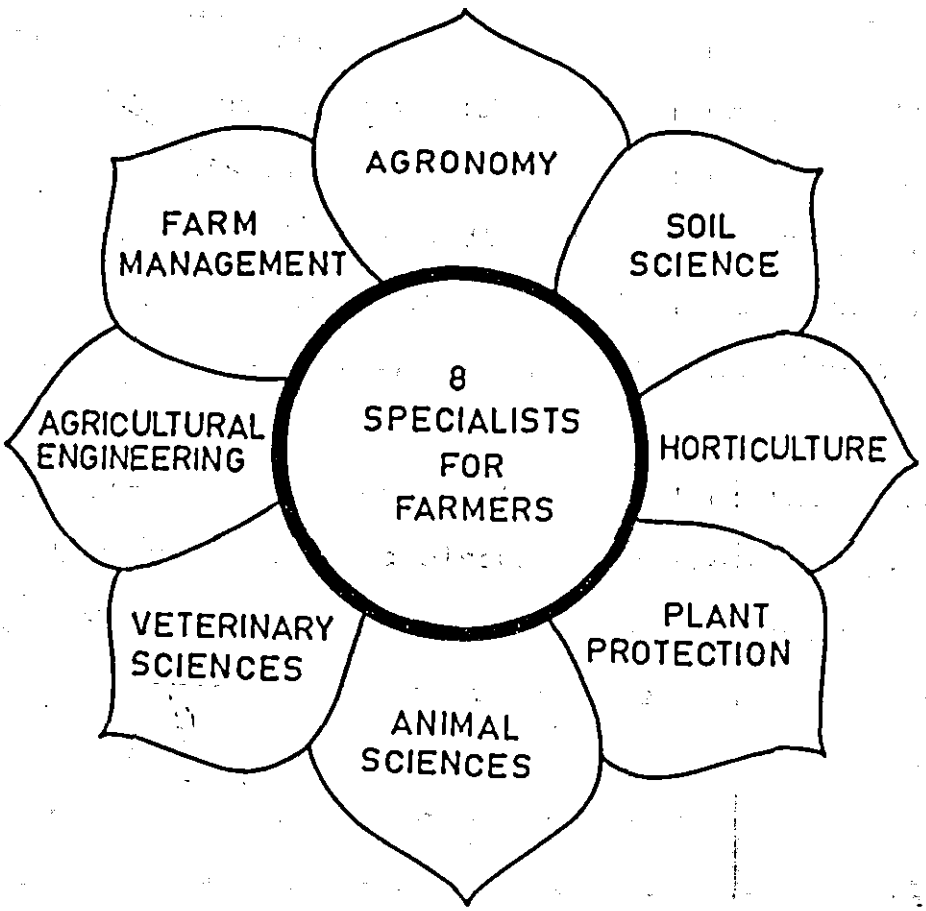



FIGURE 5·3 TEAM OF AESs PROVIDED AT KGKs AT THE TIME OF INCEPTION OF HAU (FEBRUARY 2, 1970)

AES from those of the others. On the other, these clearly indicated the items of collaboration of one AES with others in his team. Thus, this was an attempt to compartmentalize their work or to encourage isolation but it was to bring in well coordinated team work. This is evidenced from the opinions obtained by the supervisory authorities from the AESs while on their tours to districts subsequent to the issue of the 'Job Book'. The 'Job Book' is expected to help clarify the role of the AESs to the non-university officials at the State, District and Block levels, e.g., Deputy Commissioners, District Agricultural and Animal Husbandry Officers, Block Development and Panchayats Officers, etc. A 'Job Book' of this kind was not known to have been prepared elsewhere in the country.

**5.1.8 Programme Planning:** All the University-Level Extension Specialists prepared a calendar of operations to be performed by the farmers each month separately. Each operation to be performed by the farmers for taking up farming on scientific lines, necessitated quite a few activities on the part of the extension specialists in order to provide a scientific start to these operations. These activities were listed out. These lists indicated what extension activities like preparation of farm literature, demonstrations, campaigns, trainings, film shows, meetings, etc., were to be organised when, where, how, for whom and by whom. This involved not only the Extension Specialist at the University-levels and the Training and Information staff of the Directorate of Extension but also the concerned Professors, Lecturers and equivalents of these in research depending on who

was most competent to perform the particular activity. By this involvement, the extension functions of each Department will be discharged better quantitatively as well as qualitatively. This was one of the steps towards a meaningful integration of teaching, research and extension.

The programme, thus, prepared was reviewed each month for being actually taken up in different districts. For this purpose, systematic monthly meetings of all AESs at each FASC were planned.

**5.1.9 Modus Operandi for Technology Transfer:** As already pointed out the dissemination of the findings of research and technical information throughout the State of Haryana from crop sciences, animal sciences, veterinary, agricultural engineering, home science and other allied sciences was the responsibility of HAU according to the Act of Parliament that established the university.

Research findings and technical information in these sciences were generated in several departments of various colleges of the university. The head of a department was responsible for extension work in his discipline as he was for research and teaching. He coordinated these three aspects within his department.

The head discharged his extension education responsibility mainly through the ULESs and DESs (then AESs) in his subject-matter in case the discipline had a major extension education contribution to make. It was so in Agronomy, Horticulture, Vegetable Crops, Soil Science, Entomology, Plant

Pathology, Animal Sciences, Veterinary, Agricultural Engineering, Agricultural Economics (Farm Management), and Home Science (Figure 5.4). Some of the departments had limited extension educations chemes. These were cotton extension in Plant Breeding Department, custom hatching in Livestock Production and Management Department, training stud bulls and staff for artificial insemination in Animal Product Physiology Department. Most of the departments of different colleges of HAU made their extension education contribution in various other farms which constituted general university-wide activities of the Extension Directorate, e.g., extension literature, Agricultural Officers Workshops (AOWs), Kisan Mela, Farm Darshan, etc.

The year under report (1972-73) saw an end to the state of toplessness in the Extension Directorate. The vacancy of the Director of Extension Education was filled up with Dr. Jagdish C. Sharma on February 10, 1973 (vide item No. A-6 of the 19th meeting of the Board of Management held on February 9, 1973). Dr. Sharma was the founder Director of Extension Education of the university. Till then he operated as Additional Director of Extension Education. The concept of mooting the set up of Farmers Advisory Service Centres, which subsequently came to be known as Krishi Gyan Kendras by Dr. Sharma. The approbation received for this concept of KGKs was an encouraging morale booster. The commendation for adoption of this concept in the rest of the India was noteworthy. Interestingly, the monthly "Krishi Vikas" of Jaipur had gone to the extent of commending

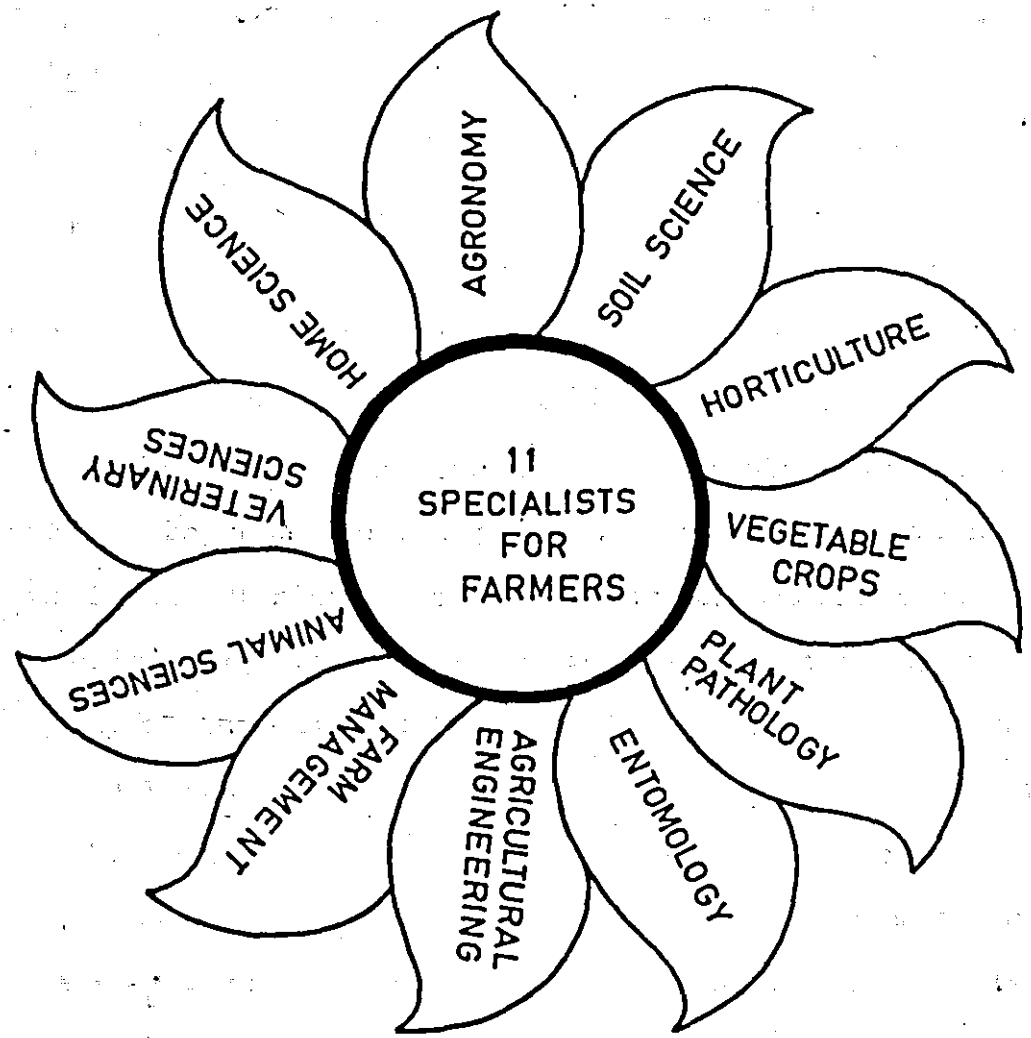



FIGURE 5·4 TEAM OF DESs EXISTING AT KGKs IN 1992-93

the adoption of this idea down to the Block-level rather than keeping it limited to the district-level. It was a matter of genuine pride that the lead taken by this university in the matter of extension education work was sought to be emulated by other agricultural universities.

After the inception of HAU, there were tremendous developments and a number of extension education activities which were unique to HAU only were conceptualized and given a practical shape. Several of these activities based on their utility were strengthened for still better impact.

**5.1.10 Shaping and Re-shaping of the Technology Transfer Model:** To further progress and prosperous, any organization has to be dynamic in its various facets. For multifarious reasons which could originate from the suprasystem, the shaping and re-shaping of the organization starts at one time or the other. On the one hand, this may necessitate creation of new positions and units, on the other hand this may call for modification in the existing units. Exactly this happened with the extension education organization of HAU as has been briefly indicated hereunder:

The nomenclature of the training wing (Junior Staff School) of the Directorate of Extension Education was changed to Institute of Agricultural Technology Training and Education (IATTE) in the year 1973.

The designation of Assistant Extension Specialists was changed to District Extension Specialists (DESs). Likewise, the

designation of DES (Seniormost) who by virtue of his seniority used to be the incharge of KGK was changed to Coordinator, KGK.

New positions of DESs were created in the disciplines of Home Science, separate DESs for Plant Pathology and Entomology, Vegetable Crops and Nematology were provided. Subsequently, ULESs for Home Science, Poultry and Vegetable Crops, were also appointed.

Contrary to the earlier practice in which the three Wings of the Directorate of Extension Education particularly Farm Advisory Service, the positions of Associate Director Farm Advisory to coordinate the farm advisory work and Associate Director Training to spearhead the Training Wing were created. The nomenclature of Agricultural Information Officer was changed to Joint Director (Extension). At the same time, the position of Extension Specialist (Extension) was done away with.

A new Directorate of Publication was created by the Board of Management on 14.6.1978 and the Press and Photographic Units were put under the control of the Directorate of Publications.

A significant development took place in 1982 when the Extension Education qualifications for the position of Director of Extension Education were not considered essential and scientists from other disciplines in agriculture and allied sciences could be appointed.

What is noteworthy is the fact that there has been significant increase in the budget of the Directorate of

Extension Education. From a meagre budget of Rs. 20.41 lakh in the first year of inception of HAU it increased to Rs. 287.45 lakh during period of 22 years. Now with the exception of a few districts, the KGKs were located in university buildings.

Recently some new activities, such as, Horticultural Officers Workshop, Women in Agriculture Day, Vocational Trainings for Farm Youth and Women were organised.

**5.1.11 Conversion of KGKs into KVKs:** According to Annual Report for the year 1990-91 a big step up activity of the KGK was the conversion of 12 KGKs into 16 KVKs under the financial arrangement of ICAR. The KVKs have already been set up at Faridabad, Jind, Kaithal, Kurukshetra, Sonipat and Yamuna Nagar in addition to Sadalpur (Hisar) where already existed.

The Extension Education Institute, Nilokheri was also taken over by the university.

## SECTION 2

### 5.2 Interdepartmental Linkages Essential for Reinforcing and Revitalizing the Technology Transfer Model

Technology transfer is a complex phenomenon requiring live functional interaction between scientists and extension workers at different levels. In so far as HAU model was concerned, the subject-matter HODs were responsible for coordinating teaching, research and extension activities of their respective departments which was a statutory provision (Chapter II). For efficient technology transfer, functional interaction between the HODs (in collaboration with the research scientists of their respective departments), ULES and DESs with administrative, budgetary and infrastructural support from the Directorate of Extension Education which was responsible for interdepartmental, inter-college coordination of their extension education activities was inevitable.

**5.2.1 Subject-Matter Heads of Departments:** The data were collected from 18 HODs on different aspects as follows:

**5.2.1.1 Training Obtained in Extension Education:** A significant majority of HODs (83.33%) had not obtained training in extension education. Those who had obtained training (16.67%) were quite few and the duration of training obtained by them was found to be one week and one month. This included one respondent who also possessed doctorate degree in Extension Education. Those with training in extension education expressed that the training enormously benefitted them in multifold ways in the transfer of message (technology).

The data collected to find out the interest of HODs in obtaining a training in extension education indicated that 55.56 per cent of them were not interested in obtaining the training. The remaining 44.44 per cent showed interest in extension education training of duration ranging from one week, few months, and few months to one to two years at a good institution in India and abroad.

**5.2.1.2 HODs Concept of Extension Education:** The HODs were asked as to how they conceptualized Extension Education. Of the 18 respondents, 12 expressed their concept as follows:

(i) It is education out of school and is a two ways channel.

(ii) Extension Education is training and education in respect of transfer of technology. Extension is the function of government agencies which also involves service in respect of inputs.

(iii) Ways or means adopted to understand the technology and how to educate others in an effective manner so that technology is communicated to users without distortion.

(iv) Effective communication, advise, training and transfer of technology to the farmers with a sole aim to increase their production and profitability.

(v) A two-way channel where the problem of farmers are brought to the technocrats, their solutions are derived and the technologies are practically implemented by the farmers for better production and economic returns.

(vi) This is a two-way bridge from farmers to scientists and back. The technology derived is to be fed to the farmers. The problem of farmers are to be carried to the scientists for their solutions.

(vii) To familiarize the beneficiaries (farmers, cattle owners, etc.) about the result of research which will help them to increase their income by adopting those results or practices.

(viii) Extension means transfer of technology to field vets and other scientists related to the subject.

(ix) It is the transfer of technology from lab to the farmer for better upliftment of the masses in terms of increased awareness about the new concept in agriculture and animal husbandry practices.

(x) Extension is the discipline which deals with methods of transfer of technology, information from lab to land, monitoring and assessing the impact of transfer of technology.

(xi) It is an applied science which takes into account all the latest technologies for sysnthesis so as to generate developmental process which creates lasting impact on behaviour of the individual.

(xii) Extension is process of transferring knowledge and technology to the clientele to enable them to utilize knowledge for betterment. Extension Education is an academic discipline.

**5.2.1.3 Research Findings for Transmission :** The HODs were required to list five important research findings of their department which needed to be passed on to the farmers through extension agency. The responses to this question in most of the cases were not specific. But it was established that almost every department had some recommendations for dissemination to the clientele concerned.

**5.2.1.4 Dissemination of Research Findings:** The HODs were further required to indicate as to which of the above mentioned

research findings they had already managed to disseminate and how. Their responses indicated that the 'how' part was done through demonstrations, publication of popular articles and leaflects, discussions, personal contacts, radio and T.V. talks, training programmes, adaptive research trials, etc., with the utilization of their respective extension teams.

**5.2.1.5 Factors which Impede Forwardal of Research Findings to Extension Agencies:** To find out the reasons or circumstances which hindered the forwardal of some of the research findings, if any, to the extension agencies, the responses were obtained from HODs. Interestingly, the relevant reasons were different with different HODs. Their overall responses were found to be as follows:

(i) Non-availability of funds for large scale production of HYV seeds, demonstration of bio-control agents, result demonstrations of improved practices by field staff, etc.

(ii) Lack of interest among farmers for the application of costly chemicals.

(iii) Lack of mechanism for the transfer of research findings to extension agency. Some of the findings being of general nature were mainly concerned with the government policies.

(iv) Lack of facilities for vigorous testing or trials at farmers' field before including the recommendations in the Package of Practices.

(v) Lack of rapport between department and extension agency.

(vi) Lack of systematic and coordinated aproach of the agencies working for farmers.

(vii) Lack of facilities for extension work.

(viii)Lack of faculty members having interest for extension jobs.

(ix) Non-availability of growth regulators in the market.

(x) Lack of cooperation from the extension agency.

(xi) Poor rate of adoption because of illiteracy.

**5.2.1.6 How HODs Keep ULESs and DESs Abreast of Latest Advances in the Subject-Matter:** To determine as to how the subject-matter HODs kept their ULESs and DESs abreast of the latest research findings related to their respective disciplines, their (HODs) responses were obtained and are presented below:

(i) Through refresher training, meetings, group discussions, workshops, conferences, seminars, besides introduction with the scientists of the department at least twice a year.

(ii) Through obtaining participation in seminars and research meetings.

(iii) Yearly meeting with ULES and DESs with the scientists of the department.

(iv) Periodic refresher courses for DESs.

(v) By issuing leaflets, supply of latest research findings to ULES and ULES supply to DESs.

(vi) Through lectures organized from time to time.

(vii) Through articles published in the magazines.

**5.2.1.7 Allotment of Teaching and/or Research Work to ULESs and DESs:** The opinion of the HODs was invited whether ULESs and DESs should be given teaching and/or research work in addition to their extension duties. A significant majority of them (88.89%) replied in affirmative. They were further required to justify the allotment of teaching and research work

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to faculty members on the extension side. Their responses to this were as follows:

(i) Teaching and research work will get benefitted with their extension experience.

(ii) DESs can do research work on field problems.

(iii) They should be considered part and parcel of their respective departments.

(iv) It will help to keep them informed of the latest development in their subject-matter areas.

(v) It will keep them in touch with recent literature.

(vi) Their involvement in teaching and research will make them to visit library.

The remaining 11.11 per cent were not in favour of allotting teaching and research work to faculty members on extension side because of the nature of their duties which involved touring.

**5.2.1.8 Administrative and Technical Control of ULESs and DESs:** The opinion of HODs was invited about the technical and administrative control of ULESs and DESs (Table 5.1).

Table 5.1. Administrative and Technical Control of ULESs and DESs

| Sl. No. | Type of control | Frequency (N=18) | Percentage |
|---|---|---|---|
| 1. | Complete control with the department | 10 | 55.56 |
| 2. | Complete control with the DEE | - | - |
| 3. | Technical control with the department and administrative control with the DEE | 8 | 44.44 |
| | Total | 18 | 100.00 |

The Table 5.1 shows that more than half of them (55.56%) were for complete control of the extension faculty members with the department. The remaining 44.44 per cent suggested that technical control should be with the department and administrative control with the DEE. However, none of the HODs opted for complete control with the DEE.

**5.2.1.9 Seating of ULESs:** The responses of the HODs were obtained about the seating arrangement of ULESs giving them four options as contained in Table 5.2.

Table 5.2. Seating of ULESs

| Sl. No. | | Frequency (N=18) | Percentage |
|---|---|---|---|
| 1. | Whole-time in the department | 5 | 27.78 |
| 2. | Forenoon in the department and Directorate of Extension Education in the afternoon | 7 | 38.89 |
| 3. | Forenoon in the Directorate of Extension Education and in the department in the afternoon | 4 | 22.22 |
| 4. | Whole-time in the Directoaate of Extension Education | 2 | 11.11 |
| | Total | 18 | 100.00 |

Interestingly, nearly two-fifth of them (38.89%) opted for the existing seating arrangements, that is, forenoon in the department and Directorate of Extension Education in the afternoon. There were 27.78 per cent HODs who desired that they should sit for whole-time in the department and 11.11 per cent wanted them to sit in the Directorate of Extension Education

for the whole-time. The remaining 22.22 per cent suggested that they should sit in the Directorate of Extension Education in the forenoon and in the department in the afternoon. Accordingly, a majority of the HODs wanted dual seating arrangements for the ULESs.

**5.2.1.10 Collaboration with Other Departments:** The HODs were asked whether the extension activities of their respective departments were carried out independently by the department or in collaboration with other departments. While two-third of them (66.67%) reported that the activities of their department were carried out in collaboration with other departments. The remaining 33.33 per cent informed that the activities were carried out independently.

They were further asked the names of the collaborating departments. Their responses are contained in Table 5.3.

A perusal of the Table 5.3 will indicate that most of the departments were working in collaboration with other concerned departments. At the same time, this collaboration in some of the departments was lacking which ultimately weakened the functional linkages.

The HODs were further asked whether they were getting the required level of cooperation from the collaborating departments. A significant majority of them (88.89%) replied in affirmative. The remaining 11.11 per cent replied in negative.

The suggestions of HODs were invited as to how should the university strengthen the collaboration between different

Table 5.3. Collaboration with Other Departments

| Sl.No. | Department | Collaborating Departments |
|---|---|---|
| 1 | Agronomy | Farm Management, Horticulture, Vegetable Crops, Entomology, Plant Pathology. |
| 2 | Agricultural Meteorology | Agronomy, Entomology, Plant Pathology |
| 3 | Horticulture | Entomology, Plant Pathology, Nematology |
| 4 | Nematology | Entomology, Plant Pathology |
| 5 | Plant Breeding | Agronomy, Plant Pathology, Entomology. |
| 6 | Plant Pathology | Vegetable Crops, Horticulture, Entomology |
| 7 | Soil Science | Agronomy, Microbiology, Agricultural Engineering |
| 8 | Vegetable Crops | Department of Horticulture, Haryana |
| 9 | Animal Nutrition | Animal Feed Technology |
| 10 | Veterinary Clinics | All Clinical Departments |
| 11 | Foods and Nutrition | Child Development, Home Science, Extension Education, Family Resource Management |
| 12 | Home Science Extension | Foods and Nutrition, Child Development, Family Resource Management, Clothing and Textiles, Agricultural Engineering, Entomology, Plant Pathology |

departments for effectively organizing the extension education activities. Their responses to this were as follows:

(i) By defining the respective role/action to be taken by the collaborating department(s).

(ii) Collaboration be assured at the level of Dean.

(iii) Through meetings between the department organizing the extension programmes and the collaborating departments.

**5.2.1.11 Functional Constraints of HODs:** The HODs were required to specify the actual functional constraints encountered by them in promoting the extension education programmes of their respective departments. The results are presented in Table 5.4.

Table 5.4. Functional Constraints of HODs

| Sl.No. | Constraints | Frequency (N=18) | Percentage |
|---|---|---|---|
| 1. | Shortage of budget | 14 | 77.78 |
| 2. | Problem of mobility for want of a vehicle | 8 | 44.44 |
| 3. | Lack of audio-visual aids | 8 | 44.44 |
| 4. | Lack of incentive to extension worker | 7 | 38.89 |
| 5. | Lack of interaction between research and extension staff | 6 | 33.33 |
| 6. | Lack of polyclinic at district level | 4 | 22.22 |
| 7. | Too much paper work | 2 | 11.11 |
| 8. | Centralization of powers | 2 | 11.11 |

The functional constraint encountered by HODs in promoting the extension education activities programme included shortage of budget (77.78%), problem of mobility for want of a vehicle (44.44%), lack of audio-visual aids (44.44%), lack of incentive to extension workers (38.89%), lack of interaction between research and extension staff (33.33%), lack of polyclinic at district level (22.22%), too much paper work (11.11%) and centralization of powers (11.11%).

The study indicates that a significant majority of HODs had obtained no training in extension education. In an organization the individuals should not be expected to do jobs in which they are not trained. Without having obtained training in extension education they may find themselves in difficult situation in monitoring extension activities of their respective departments.

A perusal of the concept of Extension Education as carried by HODs indicates that there is need for providing them training and education in the philosophy and methodology of Extension Education.

It should be obligatory on HODs to keep sending brief notes on important research findings as and when available to the Directorate of Extension Education for dissemination to the field. As and when some useful research findings of applicable value become availabe a composite programme for technology transfer should be chalked out for each of the recommendations. The same message should be passed on to the concerned clientele

in different ways so that the farmers get adequate attention towards the recommended practices for application at their farm.

The study has brought out some factors which go to impede the forwardal of research findings to extension agency (5.2.1.5). Of the several factors, lack of funds for extension activities like demonstrations, lack of rapport between the department and extension agency, lack of faculty members having interest in extension jobs, etc., need special attention.

Though different HODs have been adopting different methods for keeping their ULESs and DESs abreast of latest advances in their discipline. Yet one of the HODs has pointed out that, "Hardly any provision exists in this university for such a purpose". It would be appropriate to develop an effective mechanism for this purpose, particularly, for DESs who visit their departments only occasionally.

The extension staff as also favoured by majority of the HODs should be given teaching or research work which will help them in whetting their knowledge besides taking up research on field oriented-problems to which faculty members in the department have less access.

Ever since the Directorate of Extension Education has come up the technical and administrative control of the faculty members on the extension side has been a matter of controversy as also indicated by this study. The HODs are divided on this issue while a sizable number of them want both technical and administrative control, the others feel satisfied with the

technical control only. However, it is worth noting that none of them is willing to accept complete control of the DEE on the extension faculty members (Table 5.1). Nevertheless, dual control has got its own merits and demerits but there is need for a balance in which line and function recognize the contribution of others., working together in harmony (Pfiffner and Presthus, 1960). Therefore, there is need for developing an effective policy, regarding their control to avoid uncalled for issues which only adversely affect the overall performance of the extension programmes of the university.

The ULESs have to serve as a liaison person between their respective department and the Directorate of Extension Education. The nature of their job demands constant interaction with the scientists in their subject-matter department. They have to be associated with the teaching, research and other activities of the department. Obviously, then they have to be seated at both the places as suggested by a majority of the HODs. However, whether they should sit in the forenoon or afternoon in the department or Directorate of Extension Education has to be sorted out on concensus basis between the concerned authorities and HODs (Table 5.2).

The information contained in Table 5.3 suggests that a majority of departments do carry out extension activities in colalboration with departments having common area of work. For instance, Entomology and Plant Pathology and Agronomy and Soil Science. In so far as this collaboration is concerned, the

departments have already been grouped together to take up extension activities in collaboration with the concerned departments.

To achieve effective collaboration between the departments, the department which spearheads an extension activity should conduct meetings with the departments whose collaboration is needed. The relevant facts pertaining to the activities, type of collaboration sought, extent of help needed with complete details of the programme should be circulated well in advance so as to give reasonable time to the collaborating departments for preparing to act for the needed action on their part. The problems and bottlenecks, if needed, be sorted out through mutual discussions.

The functional constraints indicated by HODs in promoting extension education programmes of their disciplines need proper attention of the university authorities. Some of the constraints like shortage of budget, problem of mobility for want of a vehicle, lack of interaction between research and extension staff, etc., have to be tackled on priority basis. Likewise, there should be a provision for a short duration training in extension education to motivate and prepare the scientists for extension jobs (Table 5.4).

The strengthening of the aforementioned interdepartmental linkages might further improve the performance of the extension programme.

**5.2.2 University-Level Extension Specialists:** The ULESs shouldered the responsibility of planning and coordinating the extension programmes of their respective subject-matter areas for the State of Haryana at the university level. The information on relevant aspects concerning the interdepartmental linkages were obtained from the 12 ULESs in position at the time of data collection; and the same is presented hereafter.

**5.2.2.1 Experience:** The study indicated that the total experience of ULESs ranged from 13 to 32 years. With the exception of one ULES, all of them were in professors rank. In so far as their experience on the present position was concerned, it ranged from 2 to 16 years. Five of the ULESs had also worked as head of their respective departments. Eight of them were transferred to their present position and the remaining four were appointed through selection. While half of them (6) felt satisfied on the job of ULES, the remaining four and two wanted to be shifted to research and teaching position, respectively.

**5.2.2.2 Itinerary:** It was found that most of the ULESs (10) toured for an average number of 5 to 8 days and the remaining two of them for upto four days in a month. For most of the time, the tour was undertaken in a university vehicle. Most of them (9) on an average visited 3 to 4 districts in a month. There was only one case in which the districts toured were five. The remaining two had visited on an average 2 districts.

For supervising the work of DESs, on their visits to KGKs half (6) of the ULESs on an average visited 6 to 8 villages. While one of them claimed to have visited 12 villages, the remaining five visited 3 to 5 villages.

**5.2.2.3 Steps followed in Preparing Annual Programme of Work:** The information was collected as to what steps were followed in preparing annual programme of work. It was found that eight of the 12 ULESs obtained feedback from their respective DESs and in consultation with their HODs chalked out the annual programme of work. The information available from the remaining four ULESs indicated different ways of preparing the annual programme like preparation of programme on the basis of past experience, developmental needs of the district, preparation of month-wise work schedule, etc.

On further probing, it was found that all the ULESs discussed the annual programme of work with their respective HODs and other faculty members of the department and also with their DESs. It was also reported that all of them presented a seminar on the annual programme of work in their department. However, only 7 of them claimed that they presented the same seminar in the Directorate of Extension Education also.

**5.2.2.4 Collaboration Obtained by ULESs from Other Disciplines:** The ULESs were required to indicate the names of the ULESs/ departments with whose cooperation and collaboration they carried out their extension activities. The names of the collaborating departments for different disciplines are presented in Table 5.5.

Table 5.5. Collaboration Obtained by ULESs from Other Disciplines

| Sl.No. | ULES/Discipline | ULESs/Collaborating Departments |
|---|---|---|
| 1. | Agronomy | Soil Science, Farm Management, Plant Pathology, Entomology |
| 2. | Agricultural Engineering | Agronomy, Soil Science, Home Science |
| 3. | Entomology | Plant Pathology, Vegetable Crops Horticulture |
| 4. | Farm Management | Agronomy, Plant Pathology, Entomology, Home Science, Animal Science, Veterinary Science, Poultry |
| 5. | Horticulture | Soil Science, Agricultural Engineering |
| 6. | Plant Pathology | Entomology |
| 7. | Soil Science | Agronomy |
| 8. | Vegetable Crops | Plant Pathology, Entomology |
| 9. | Home Science | Plant Pathology, Entomology, Soil Science |
| 10. | Animal Science | Veterinary Science, Poultry, Agronomy |
| 11. | Poultry | Veterinary science, Animal Science, Home Science, Farm Management |
| 12. | Veterinary Science | Animal Science, Poultry |

It was interesting to find that none of the ULESs reported lack of collaboration or problems encountered in obtaining collaboration from any of the departments.

**5.2.2.5 Utilization of One-Third Time by ULESs:** All the ULESs indicated that one-third of time was devoted by them to the teaching of courses and guidance of post-graduate students in their respective departments. Very few of them also mentioned the utilization of time in the preparation of projects, writing of academic chapters besides undertaking studies in the library.

**5.2.2.6 Participation of ULESs in Research Work:** Of the 12 ULESs, only four of them reported their involvement in research work. They claimed this participation in research work through the guidance of M.Sc. and Ph.D. students and operation of ICAR research projects. None of them reported any difficulty in carrying out the research work.

**5.2.2.7 Publication by ULESs:** The study indicated that of the 12 ULESs 10 of them had published research papers. Of these, six had published 1 to 5 papers, three 10 to 13 papers and one 22 papers.

Regarding extension papers a great variation was observed in the number of papers published. While one claimed to have published 400 papers, in case of others the number of papers published ranged from 3 to 41.

One of the ULESs had also published 5 extension bulletins and 4 research bulletins.

The research papers were published in the journal of their respective disciplines. The extension papers were published in 'Haryana Kheti', 'Haryana Farming', 'Krishi Agardoot' and some other popular magazines published outside the university.

**5.2.2.8 Monthly Newsletters:** It was found that of the 12 ULESs, nine of them were bringing out monthly or quarterly newsletters in their subject-matter areas. On further probing, it was reported that the newsletters were being brought out by them independently. The newsletters in the disciplines of Agronomy, Agricultural Economics and Horticulture had not yet been started.

**5.2.2.9 How ULESs Keep Themselves Abreast of Latest Advances in their Subject-Matter Areas:** The ULESs were asked as to how they kept themselves abreast of the latest advances in their respective subject-matter areas. It was through the study of relevant literature constituting research journals, dailies, participation in seminars, conferences, review of research papers, and teaching of courses in their departments.

**5.2.2.10 How ULESs Get Professional Support from their Department:** The ULESs were required to indicate as to how did they get professional support from their subject-matter departments. They reported getting professional support from their departments through discussion with their respective HODs, seminars organized in the department, guidance of post-graduate research, research trials and teaching of courses.

**5.2.2.11 Interest of ULESs in Advanced Training:** The ULESs were required to indicate that if they were given an opportunity for undergoing a training programme what would be the specific areas and field of specialization in which they would like to be trained. The areas of their interest and other relevant information are presented in Table 5.6.

Table 5.6. Interest of ULESs in Advanced Training

| Sl.No. | Discipline | Field of specialization | Duration | Institution |
|---|---|---|---|---|
| 1. | Agronomy | Crop Husbandry and Water Management. | 1 month | IARI, New Delhi |
| | | Fertilization and Water Management under Dry farming conditions. | 1 year | Directorate of Dry Land Farming, Hyderabad |
| 2. | Agricultural Engineering | Soil and Water Conservation - Drip Irrigation | 5-6 months | Israel |
| 3. | Entomology | Pest Management in Paddy | 3 months | Manila (Philippines) |
| | | Heliothis Management | 1 month | ICRISAT (Hyderabad) |
| 4. | Farm Management | Use of Computers in Extension Management | 1 month | IIRD, Hyderabad or Abroad |
| 5. | Horticulture | Irrigation Requirement of Fruits. | 4-7 days | IARI, New Delhi |
| | | Extension Methods for Marketing of Horticultural Produce | 7-10 days | MANAGE, Hyderabad |
| 6. | Plant Pathology | Bio-control of Insect-pests | 1 month | Coimbatore |
| 7. | Home Science | Extension Methology and Management of Field Extension Programmes | 6 months | Abroad |
| 8. | Animal Science | Livestock Production and Management | 1 year | U.S.A./Denmark |
| 9. | Poultry | Advanced Training in Poultry Nutrition | 1 year | U.S.A. |

It is noteworthy that ULESs showed interest in obtaining training in institutions both within and outside the country. Most of them preferred to obtain training in the area of their specialization only.

**5.2.2.12 ULESs' Interest in Training in Extension Methodology:** All the ULESs showed their interest in obtaining training in extension methodology.

**5.2.2.13 Farming Problems Intimated to HODs:** To determine if the ULESs had intimated the farming problems to their respective HODs during the last one year for research and finding suitable solutions, the data were collected (Table 5.7).

An examination of Table 5.7 indicates that most of the ULESs had intimated field problems to their respective HODs for research wherever needed for further necessary action calling for administrative or other suitable action necessary to ease out the problems. It may be noted that the problems pointed out by them were mostly already known and continue to persist year after year.

**5.2.2.14 Assessment of Quantitative and Qualitative Changes:** The ULESs were asked as to how did they make an assessment of quantitative and qualitative changes brought out through extension activities of their disciplines. Their reactions were found to be as follows:

**(i) Quantitative Changes:** The ULESs reported that there was increase on continued basis in the adoption of new

Table 5.7. Field Problems Intimated by ULESs to their HODs during the Last One year

| Sl.No. | ULES/Discipline | Field problems |
|---|---|---|
| 1. | Agronomy | Non-availability of seed-cum-fertilizer drill for sowing of most of the crops. Sale of poor quality seeds by some agencies and dealers. |
| 2. | Agricultural Engineering | Paddy trapping<br>Mustard drill |
| 3. | Entomology | Heliothis problem in sunflower (Whole State)<br>Jassid problem in cotton (Sirsa and Hisar districts)<br>Mite problem in litchi (Ambala and Yamuna Nagar districts) |
| 4. | Farm Management | Failure of the farmers to work out the economics of horticultural crops.<br>Population growth and labour absorption capacity of State agriculture.<br>Problems and prospectus of agro-processing industries in the State. |
| 5. | Horticulture | Mango malformation<br>Guava wilt<br>Small sized fruits in ber. |
| 6. | Plant Pathology | Powdery mildew in ber.<br>Malformation of fruits in mango. |
| 7. | Soil Science | Lack of knowledge about the proper seed rate for green manuring (Dhaincha) and proper composting technique. |
| 8. | Vegetable crops | Non-availability of quality vegetable seeds. |
| 9. | Home Science | Poor health and hygiene status of rural women |
| 10. | Animal Science | Winter management of buffalo/cattle.<br>Problems of livestock management in summer. |
| 11. | Poultry | Replacement of fish meal.<br>Cheap poultry ration preparation. |
| 12. | Veterinary Science | Infertility in buffaloes in summer. |

technology by farmers, new crop varieties were in greater demand, farmers' perception of economics related to crop and vegetable production, particularly, input and output ratio, costs and profits was on the increase and there was increase in the per unit consumption of NPK.

**(ii) Qualitative Changes:** The qualitative changes were improvement in the quality of trainings and demonstrations, types of visual aids used in trainings, meetings and other field activities, timely publications of popular articles, use of sophisticated instruments and costly chemicals for improving production, increasing awareness about the quality of seeds and increasing interaction of farmers with the extension staff.

The ULESs were further asked to give some concrete examples of quantitative and qualitative changes brought out through extension activities of their discipline. To this, they pointed out adoption of intensive cropping system, use of HYVs seeds, proper handling of pesticides and their usage, increasing awareness of important symptoms of common plant diseases, higher profits and higher use of inputs in different enterprises, increase in the area under fruit cultivation and efficient use of resources by the farmers.

**5.2.2.15 Problems Encountered by ULESs:** The ULESs were required to indicate the problems encountered by them in carrying out their routine work. Their observations are contained in Table 5.8.

Table 5.8. Problems Encountered by ULESs

| Sl.No. | Problems | Frequency (N=12) |
|---|---|---|
| 1. | Difficulty in undertaking required touring for want of a vehicle | 8 |
| 2. | Shortage of funds for contingency and travelling and daily allowances | 7 |
| 3. | Lack of audio-visual aids | 6 |
| 4. | Lack of funds for publication of leaflets, handouts, newsletters, etc. | 6 |
| 5. | Lack of stenographic facilities | 6 |
| 6. | Lack of telephone facilities | 5 |
| 7. | Lack of an helping hand to assist ULESs in their day-to-day work | 5 |
| 8. | Lack of services of artists for preparing panels, charts, etc. | 3 |
| 9. | Lack of xeroxing facilities | 3 |
| 10. | Lack of cooperation from some officials of State departments | 3 |
| 11. | Problem of lack of interest of most of the DESs in extension job | 3 |
| 12. | lack of timely help from department on occasions | 2 |
| 13. | Problem of coordinating veterinary and animal science activities at KGKs and University headquarters | 2 |
| 14. | Lack of micro-processing facilities | 2 |

The study has revealed several problems, such as, difficulty in undertaking requied touring for want of a vehicle (8) shortage of funds for contingency and travelling and daily allowances (7), lack of audio-visual aids (6), lack of funds for publication of leaflets, handouts, newsletters, etc., (6), lack of stenographic facilities (6), lack of telephone facilities (5), lack of an helping hand to assist ULESs in their day-to-day work (5), lack of services of artist for preparing panels, charts, etc., (3), lack of xeroxing facilities (3), lack of cooperation from some officials of State departments (3), problem of lack of interest of most of the DESs in extension job (3), lack of timely help from department on occasions (2), problem of coordinating veterinary and animal science activities at KGKs and university headquarters (2), and lack of micro-processing facilities (2).

**5.2.2.16 Facilities Suggested by ULESs for DESs:** The ULESs were required to indicate the facilities which in their opinion need to be immediately provided to their respective DESs so as to make them work still more efficiently.

The ULESs suggested the provision for a computer and data enumerator (2), micro-processor (2), panels for display (3), audio-visual aids (5), charts and slides (5), supply of adequate inputs for free distribution to farmers (3), adequate transportation facilities for tour (6), more funds for travelling and daily allowances (9), demonstrations (4), provision for soil and water testing kits (2), kits for home

science DESs, provision for motorbike for independent touring (4), encouragement for participation in seminars, conferences (4), etc.

The provision for one beldar to DES (Entomology and Plant Pathology), a small laboratory for coloured photographs for insect-pests and damaged material were also suggested. There was also a suggestion for increase in the number of villages for undertaking extension work. Some of the ULESs also suggested for more technical support to DESs for field extension work from the State Departments of Agriculture and Animal Husbandry.

**5.2.2.17 Facilities Needed by ULESs:** The ULESs were required to give their opinion about the facilities, powers or authority which would make them sill more effective in carrying out their job. The Table 5.9 provides information about the facilities which they wanted to be given to them.

More than half of the ULESs asked for transportation facilities (9), provision for more funds for contingency, TA and POl (8). Half of them demanded better audio-visual aids (6), more stenographic facilities and administrative powers to take action against negligence (6) and telephone facilities (6).

Several of the other facilities demanded were funds for publication of bulletins, pamphlets, handouts, etc. (5), power for supervising whole of the district (4), provision for independent touring for supervisory work (4), proper

Table 5.9. Facilites Needed by ULESs

| Sl.No. | Facilities | Frequency (N=12) |
|---|---|---|
| 1. | Better transportation facilities for touring | 9 |
| 2. | Provision for more funds for contingency, TA, POL and demonstrations | 8 |
| 3. | Better audio-visual aids facilities | 6 |
| 4. | More stenographic facilities and administrative powers to take action against negligence | 6 |
| 5. | Telephone facilities in office as well as at residence | 6 |
| 6. | Funds for publication of bulletins, pamphlets, handouts, etc., in required number | 5 |
| 7. | Powers for supervising whole of the district rather than only the adopted villages | 4 |
| 8. | Provision for independent touring facilities for supervisory work | 4 |
| 9. | Proper recognition of extension work carried out by faculty members working on extension side | 3 |
| 10. | Provision for university accommodation to ULESs at one place (like hospital staff) so that farmers can contact them even on closed days and during off hours | 2 |
| 11. | The synopses of PG students must be discussed with ULESs of the respective disciplines to meet the requirement of feedback of the field problems | 2 |
| 12. | Raising the status of ULESs to the rank of professor | 2 |
| 13. | Micro-processor for data analysis | 2 |
| 14. | Provision for an Additional Director of Extension Education (Veterinary and Animal Science) | 2 |
| 15. | Provision for feed and milk testing at KGKs | 2 |

recognition of extension work (3), provision for university accommodation (2), raising the status of ULESs to the rank of professor (2), micro-processor for data analysis (2), provision for an Additional Director of Extension Education for Veterinary and Animal Sciences (2), and provision for feed and milk testing at KGKs (2).

The study indicates that all the ULESs were experienced hands in their respective subject-matter areas.

An examination of the tour details indicates that the average number of days spent on tour, district and villages visited in a month are quite satisfactory. The Annual Report (1970-72) stated, "Rather than a haphazard touring, systematic tour schedules were drawn up so that each ULESs visits each district and at regular intervals". It was expected to be more thoroughly implemented in 1972. Based on the results of this study what is needed is that there should be unanimity in the tours undertaken by ULESs as far as possible. Because of the limitations of funds, if necessary, tours may be undertaken by public transport also.

Clarity about the preparation of annual programme of work was lacking. There should be proper guidelines for the preparation of the annual programme of work. The seminar presented by ULESs should be both on achievements of the previous year and the annual programme of work for the succeeding year (5.2.2.3).

In so far as interdepartmental collaboration was concerned it was not reported to be lacking. Efforts should be continued to sustain and strengthen it (Table 5.5).

The utilization of their one-third time in teaching and similar other work did meet with the prescribed norms of the university.

The study indicates a great variation in the number of research and extension papers published by ULESs. An examination of the number of papers published indicates that more the service rendered on extension job more was the number of papers published (5.2.2.7).

The newsletters constitute an important link between the university and field functionaries as well as farmers. These act as professional enrichers and motivate the concerned clientele who follow scientific approach in tackling their problems. Since Economics includes farm management practices, newsletter in this discipline should also be introduced on monthly or quarterly basis based on the convenience involved. The same should be the case with Agronomy and Horticulture.

No doubt, participation in departmental activities like teaching of courses, participation in seminars and conferences do help in professional enrichment yet there should be a uniform inbuilt mechanism to keep the ULESs informed of the latest advances in their respective disciplines.

Since trainings provide opportunities for learning newer techniques and skills, there is need for providing

opportunities for trainings in need-based specific areas to ULESs as also observed by Gupta (1983) that trainings had a vast potential in the development of skills and utilization of technology for increased production.

Several of the field problems which ULESs claimed to have intimated to their respective HODs (Table 5.7) might get ease out with the education of the farmers and farm women. This is, particularly, true for problems related to insect-pests, poor hygiene and health status of farm women, computation of cheap poultry ration, etc.

The quantitative and qualitative changes brought out through the extension activities suggest that there has been definite impact of the activities on the farmers. However, to find out the extent of this impact in clearcut terms, a separate study may be needed.

The study has revealed a number of problems which are being encountered by ULESs in carrying out their routine work. Some of these problems like lack of facilities for touring, lack of telecommunication facilities, lack of stenographic facilities, lack of audio-visual aids facilities, etc., need immediate attention of the authorities (Table 5.8).

The working facilities with faculty members, particularly, those on extension side have a direct bearing on their performance. Most of the facilities demanded by ULESs (Table 5.11) need due consideration of the concerned authorities. The provision for these facilities can be made in phases and such of the facilities which involve less investment,

such as, telephone facilities, stenographic facilities, raising the status of ULESs to professor's rank (most of the ULESs are already in professor rank as a measure of personal promotion), responsibility for supervising whole of the district, etc., need to be provided to begin with. The demand for creation of the position of Additional Director of Extension Education for coordinating extension activities related to animal sciences, veterinary, and poultry is justiffied. It is a fact that the animal science and veterinary extension programmes have yet to get the needed importance in the schemes of the things.

Keeping in view the findings of the study as well as the responsibilities entrusted to ULESs who are responsible for coordinating and monitoring the extension programmes of their respective disciplines at the State level, there is need for revitalizing and reinforcing the linkages at all the interactional levels.

**5.2.3 District Extension Specialists:** The data on various aspects concerning interdepartmental linkages and other issues which could have a bearing on the performance of the technology transfer model were collected from 84 DESs. The findings have been presented hereunder:

**5.2.3.1 Appointment of DES:** It was found that 51.19 per cent of DESs were transferred from teaching and research on their present positions. the remaining 48.81 per cent got appointed through selection.

On being asked, if they wanted to continue on their present job of DES, 65.48 per cent of them replied in affirmative and the remaining 34.52 per cent wanted to got shifted to research (23.81%) and teaching (10.71%) positions.

**5.2.3.2 Experience in Teaching, Research and Extension :** For the reasons that experience of individuals plays an important role in their interest and performanced on the job, the DESs were required to indicate their experience in teaching, research and extension. The data are presented in Table 5.10.

Table 5.10. Experience of DESs in Teaching, Research and Extension

| Activity | 5 years or less | 6-10 years | More than 10 years |
|---|---|---|---|
| Teaching (N=28) | 14 (50.00) | 11 (39.29) | 3 (10.71) |
| Research (N=49) | 27 (55.10) | 9 (18.37) | 13 (26.53) |
| Extension (N=84) | 31 (36.90) | 28 (33.33) | 25 (29.77) |

Figures in parentheses indicate percentages of DESs.

The study indicated that of the 84 DESs, only 28 had experience in teaching. Of these, 14 had less than 5 years experience, 11 of them 6 to 10 years experience and 3 more than 10 years experience. Those with research experience were higher in number (49). As regards the duration of their experiesnce in reseasrch was concerned the corresponding figures were observed to be 27, 9 and 13 respectively. The

experience of DESs on the extension job varied considerably. While 31 of them had 5 years or less experience, 28 and 25 of them had 6 to 10 years and more than 10 years experience (Table 5.10)

**5.2.3.3 Educational Qualifications :** The study indicated that 51.19 per cent of the DESs possessed Master's degree in their respective disciplines. The remaining 48.81 per cent were found to have Doctorate degree.

**5.2.3.4 Training Obtained :** Of the 84 DESs, 69.05 per cent of them had obtained one or the other training of varying duration in their respective subject-matter areas either at HAU or outside HAU. For most of them, the training constituted refresher course.Only 13.10 per cent reported to have obtained training in extension methodology or audio-visual aids.

On further probing 67.86 per cent of them showed interest in obtaining training in extension methodology.

**5.2.3.5 Steps Followed in Preparation of Programme of Work:** The DESs were asked the procedural steps followed by them in preparing the monthly and annual programme of work.

The monthly programme of work was reported to be prepared keeping in view the needs of the area and resources at their disposal for carrying out extension activities. However, it was further clarified that the monthly programme of work emerged from the annual programme of work. In the preparation of annual programmes of work, according to them, respective ULESs, HODs and DESs were involved.

It was further indicated that annual programme of work mostly finalized in June-July. Sometimes with the change of Director of Extension Education it was delayed.

To another question, as to how did they ensure to complete the targets in accordance with the approved annual programme of work, the DESs responded that the activities were so planned that the promises made or targets fixed in the programme were met at least upto 95.00 per cent.

**5.2.3.6 Supervision of Work Done :** The data were collected about the supervision of the work of DESs by their seniors.

Majority of the DESs (48.81%) reported that their respective ULESs supervised their work every month. The remaining 36.90 and 14.29 per cent, claimed that their ULESs supervised their work on quarterly and half yearly basis respectively. None of them indicated supervision of their work by their respective HODs or DEE on monthly basis.

While a sizable number of DESs (38.10%) reported half yearly supervision by their respective HODs, 30.95 and 21.43 per cent of them revealed supervision of their work yearly and quarterly respectively. There were 9.52 per cent DESs who revealed the supervision of their work once in two years.

In so far as supervision by the DEE was concerned, more than half of them (57.14%) pointed out supervision after every quarter followed by 30.95 and 11.91 per cent who reported half yearly and yearly supervision respectively by the DEE.

**5.2.3.7 Participation of DESs in Research Work :** Of the 84 DESs, 77.38 per cent of them had not associated themselves in a research project or laid down adaptive research trials.

The remaining 22.62 per cent reported their participation in research projects financed by ICAR, Ministry of Agriculture, State Government, PL-480 project, etc. There were very few DESs who had to their credit research papers published on the basis of the data available from the research projects in which they were participating.

**5.2.3.8 Farming Problems Intimated by DESs to their Seniors :** The DESs were required to list the farming problems intimated by them to their ULESs or other authorities at the university headquarters during the last one year. The problems pointed out by them are contained discipline-wise in Table 5.11.

An examination of Table 5.11 indicates that the DESs intimated a number of problems to their seniors (ULESs,HODs, DEE or the concerned scientists) for further investigation and finding solution. A careful examination of the Table will suggest that the problems were of different nature and needed to be tackled at different levels with different approaches. While in case of some problems group efforts might be needed for undertaking collaborating research, in case of others timely education to the farmers might help in overcoming the problems.

Table 5.11. Farming Problems Intimated by DESs to their Seniors

| Sl. No. | Problems | To whom intimated |
|---|---|---|
| | Agronomy | |
| i) | Oozing out of gap in mustard | DEE |
| ii) | Weed control in gram | DEE, ULES |
| iii) | Actual water requirement of sunflower | DEE |
| iv) | Malformation of fruits in cotton | DEE |
| v) | Problem of weeds in wheat, gram and oilseeds | DEE |
| vi) | Non-availability of forage seed crops | DEE |
| vii) | Failure or delayed opening of cotton bolls | DEE |
| viii) | Poor germination in wheat | ULES and HOD |
| ix) | Wild oat in wheat | Professor Weed Science |
| x) | Farmers failure to raise crops in rotation | ULES |
| xi) | Non-availability of berseem seed | DEE |
| xii) | Problem of phyto-toxicity of weedicide in paddy nursery | ULES and Professor Weed Science |
| xiii) | Problem of sterility in WH-416 wheat variety | ULES and Wheat Breeder |
| xiv) | Problem of increasing infestation of wild oat | HOD, ULES |
| xv) | Problem of poor growth in cotton after sunflower | HOD |
| xvi) | Root rot in cotton | ULES Plant Pathology |
| xvii) | Piazi weed in gram | ULES |
| xviii) | Problem of santhi weed in arhar | HOD, ULES |
| xix) | Problem of yellowing of wheat crop WH-147 | DEE |
| xx) | Problem of low yield of raya | DEE |
| xxi) | Broad leaves weed in paddy | HOD |
| xxii) | Burning of paddy plant in nursery | HOD Entomology, HOD Plant Pathology, HOD Soil Science, DEE |
| xxiii) | Drying of arhar plants | HOD Plant Pathology |
| xxiv) | Problem of santhi weed in vegetables | Professors of Vegetable crops |

| Sl. No. | Problems | To whom intimated |
|---|---|---|
| | **Agricultural Engineering** | |
| i) | Puddling operation in paddy cultivation | ULES |
| ii) | Transplanting of paddy crops | DEE |
| iii) | Poisonous gas in tubewells during rainy season | HOD, ULES |
| iv) | Water table in tubewells going down every year | HOD, ULES |
| v) | Non-availability of cotton picker | ULES |
| vi) | Problem of non-availability of improved wheel hand hoe | ULES |
| vii) | Non-availability of multicrop seed drill | HOD, ULES |
| viii) | Problem of maintenance of tractors | HOD, ULES |
| | **Entomology** | |
| i) | Heliothis attack in cotton | ULES |
| ii) | Incidence of top borer in sugarcane | ULES |
| iii) | Stem rot in sunflower | HOD, ULES |
| iv) | Black carterpillar in toria | ULES |
| v) | White grub in cotton | ULES |
| vi) | Root rot in cotton | HOD, ULES |
| vii) | Painted bug in cotton | ULES |
| viii) | Stem borer in paddy | HOD, ULES |
| ix) | Cutworms in sunflower | ULES |
| x) | Hairy caterpillars in soyabean | HOD, ULES |
| xi) | Aphids in wheat | ULES |
| xii) | Problem of spray in arhar and sugarcane due to their height | DEE |
| | **Farm Management** | |
| i) | Difficulties in getting short term loan | ULES |
| ii) | Non-availability of quality seed | Regional Manager HSDC |
| iii) | Non-availability of farm record book | ULES |
| iv) | Nematodes in wheat | HOD Nematology |
| v) | Small and uneconomical land holdings | HOD, ULES |
| vi) | Problem of marketing of vegetables and mushroom | HOD, ULES |
| vii) | Problem of decline in guava | DEE, HOD, ULES |

| Sl. No. | Problems | To whom intimated |
|---|---|---|
| | **Horticulture** | |
| i) | Berry drop in grapes | ULES |
| ii) | Decline in guava | ULES |
| iii) | Non-availability of quality seeds of fruit plants | DEE, ULES |
| iv) | Drying of grapevine | HOD, ULES |
| v) | Nematodes in citrus and grape | HOD, ULES |
| vi) | Mango malformation | DEE, ULES |
| vii) | Guava wilt | DEE, ULES |
| viii) | Non-availability of young and healthy mango plants | HOD, ULES |
| ix) | Citrus decline | HOD, ULES |
| x) | Problem of marketing in kinnow and grapes | HOD, ULES |
| | **Plant Pathology** | |
| i) | Stem rot in paddy and cabbage | HOD |
| ii) | Drying of raya | Raya Scientist |
| iii) | Nematodes in grapes | HOD Nematology |
| iv) | Wilt of chilly | Vegetable Pathologist |
| v) | Gummosis in trees | DEE |
| vi) | Collar rot in raya | DEE, ULES |
| vii) | Viral problem in tomato, chillies,etc. | HOD, ULES? |
| viii) | Borer in sugarcane | HOD |
| | **Soil Science** | |
| i) | Cotton malformation | ULES Entomology |
| ii) | Problem of brackish water | ULES |
| iii) | Problem of poor performance of cotton crop which is taken after sunflower | HOD, ULES |
| | **Vegetable Crops** | |
| i) | Non-availability of quality vegetable seeds | HOD, ULES |
| ii) | Problem of virus in cucurbits, tomatoes and chillies (specially in hybrids) | HOD, ULES |
| iii) | Problems of weed in potato during advanced stage | HOD, ULES |
| iv) | Problem of fruit rottening in brinjal | DEE, HOD, ULES |
| v) | Fruit borer in brinjal | DEE, ULES |

| Sl. No. | Problems | To whom intimated |
|---|---|---|
| | **Home Science** | |
| i) | Problem in creating self employment | DEE, ULES |
| ii) | Problem in getting loan | DEE, ULES |
| iii) | Nutritional deficiency of children | DEE, ULES |
| iv) | Problem of sanitary latrine | DEE, ULES |
| | **Animal Sciences** | |
| i) | Anoestrous in buffaloes | HOD, Animal Production Physiology |
| ii) | Analysis of poultry feed/cattle feed | HOD Public Health |
| iii) | Investigation of poultry diseases | HOD, Public Health |
| iv) | High cost and poor quality of poultry feed | ULES |
| v) | Infertility and low milk yield in animals | ULES |
| vi) | Poor quality of drinking water available to livestock | HOD Public Health |
| vii) | Infertility of dairy animals | HOD Animal Production Physiology |
| viii) | Aflatoxin in poultry feed | HOD Public Health |
| ix) | Marketing problems of poultry and poultry products | ULES Poultry |
| x) | Feed formulae for livestock of different ages | ULES |
| xi) | Non-availability of molasses to farmers on cheaper rates | ULES |
| xii) | Mineral deficiency in animals | ULES |
| xiii) | Less grazing facility for animals | ULES |
| | **Veterinary Sciences** | |
| i) | Outbreak of foot and mouth disease | ULES |
| ii) | Problem of diseases like rinderpest | ULES |
| iii) | Induced lactation | HOD Animal Production Physiology |
| iv) | Fracture of forelimb | HOD Veterinary Clinics |
| v) | Low milk yield in cattle | ULES |

**5.2.3.9 How DESs Keep themselves Abreast of Latest Advances:** The various ways for keeping themselves abreast of the latest advances in their discipline used by DESs were reported to be study of journals, reports and literature, participation in meetings, seminars, conferences, listening to radio and T.V., visits to the farms of innovative farmers, contact with dealers, besides participation in refresher course, Kisan Mela and Farm Darshan.

According to majority of them (60.71%), the library facilities at KGKs were not adequate. They were also required to indicate the names of the books and journals which they wanted to be provided in KGKs library. But this question did not evoke appreciable response from them so as to draw some specific conclusions.

**5.2.3.10 Training in Extension Methodology:** A majority of the DESs (67.86%) felt that they needed training in extension methodology. The remaining 32.14 per cent did not show interest in this training.

**5.2.3.11 Difficulties Encountered by DESs:** The DESs were required to point out the difficulties being encountered by them in carrying out their routine work and which needed immediate attention of the authorities. Their responses are presented in Table 5.12.

A study of Table 5.12 will indicate that a large number of DESs pointed out lack of budget (80.59%), lack of transportation facilities (64.29%), lack of audio-visual aids (60.71%),

Table 5.12. Difficulties encountered by DESs

| Sl. No. | Difficulties | Frequency (N=84) | Percentage |
|---|---|---|---|
| 1. | Lack of budget (POL and TA) | 68 | 80.95 |
| 2. | Lack of transportation facilities | 54 | 64.29 |
| 3. | Lack of audio-visual aids | 51 | 60.71 |
| 4. | Lack of recent literature | 44 | 52.38 |
| 5. | Restricted mobility because of limiting extension work to merely 3 villages | 44 | 52.38 |
| 6. | Lack of staff at KGKs for want of filling up of vacant positions | 31 | 36.90 |
| 7. | Services of beldar not available to DESs | 22 | 26.19 |
| 8. | Lack of shed for storing implements | 18 | 21.43 |
| 9. | Lack of medicines, diagnostic kits, etc. | 12 | 14.29 |
| 10. | Lack of housing models for livestock and poultry | 10 | 11.90 |
| 11. | Lack of laboratory facilities for soil and water testing | 4 | 4.76 |

lacl of recent literature (52.38%) and restricted mobility because of limiting extension work to merely 3 villages (52.38%).

Other difficulties reported by them were lack of staff at KGKs for want of filling up of vacant positions (36.90%), beldar in position not available to DESs (26.19%), lack of

shed for storing implements (21.43%), lack of medicines, diagnostic kits, etc. (14.29%), lack of housing models for livestock and poultry (11.90%) and lack of laboratory facilities for soil and water testing (4.76%).

**5.2.3.12 Facilities Needed by DESs:** The DESs were required to specify the facilities which needed to be immediately provided to them to carry out extension work still more efficiencly. They have asked for a number of facilities as presented in Table 5.13.

More than half of them asked for provision for more funds for TA and POL (80.95%), transportation facilities (61.90%), audio-visual aids (59.92%), incentives for extension staff (54.76%) besides provision for recent literature at KGKs (52.38%).

Several of the other facilities demanded included residential accommodation (38.10%), filling up of vacant positions (35.71%), advanced training (28.57%), small scale implements (28.57%), attaching of beldars to DESs (26.19%), diagnosis of crops and animal diseases (26.19%), visiting other extension institutions (26.19%), financial powers to Coordinator (26.19%), provision for supervisors (13.10%), first-aid box (11.90%), model houses for poultry and livestock (9.52%), polyclinics (7.14%) and provision for soil and water testing laboratories (4.76%) at KGKs.

**5.2.3.13 Incentives to DESs:** The opinion of the DESs was obtained whether they should be given some incentive. A

Table 5.13. Facilities Needed by DESs

| Sl. No. | Facilities | Frequency (N=84) | Percentage |
|---|---|---|---|
| 1. | Provision for more funds for TA and POL | 68 | 80.95 |
| 2. | Provision for adequate transportation facilities | 52 | 61.90 |
| 3. | Provision for audio-visual aids | 50 | 59.52 |
| 4. | Provision for incentives for extension staff | 46 | 54.76 |
| 5. | Provision for recent literatures at KGKs | 44 | 52.38 |
| 6. | Provision for residential accommodation at KGKs | 32 | 38.10 |
| 7. | Filling up of vacant positions | 30 | 35.71 |
| 8. | Facilities for advanced training | 24 | 28.57 |
| 9. | Provision for small scale implements like seed drill, thresher, etc., at KGKs | 24 | 28.57 |
| 10. | Beldar be attached to DESs | 22 | 26.19 |
| 11. | Facilities of diagnosis of crops and animal diseases | 22 | 26.19 |
| 12. | Provision for visiting other extension institutions and to attend workshops, seminars, conferences, symposia, etc. | 22 | 26.19 |
| 13. | Financial powers to coordinator for the purchase of fertilizers, pesticides, etc. | 22 | 26.19 |
| 14. | Provision for supervisors with B.Sc. (Agri.) qualifications | 11 | 13.10 |
| 15. | Provision for first-aid box | 10 | 11.90 |
| 16. | Provision for model houses forpoultry and livestock | 8 | 9.52 |
| 17. | Porvision for polyclinics at KGKs | 6 | 7.14 |
| 18. | Provision for soil and water testing laboratories | 4 | 4.76 |

significant majority of them (90.48%) were for the grant of incentive.

They were further asked as to what type of incentive be given to them. Their suggestions to this effect are given in Table 5.14.

Table 5.14. Type of Incentive Desired by DESs

| Sl. No. | Incentive | Frequency (N=84) | Percentage |
|---|---|---|---|
| 1. | Grant of one additional increment after every 3 to 5 years | 56 | 66.67 |
| 2. | Allowance for mileage when own vehicle used for tour | 51 | 60.71 |
| 3. | Provision for one special pay every year | 43 | 51.19 |
| 4. | Provision for residential accommodation at KGKs | 40 | 47.62 |
| 5. | Provision for 10.00 per cent of basic pay as extension allowance | 32 | 38.10 |
| 6. | Provision for honorarium for dress | 19 | 22.62 |
| 7. | Provision for appreciation letter | 17 | 20.24 |

The DESs suggested the provision for incentive in several ways. Most of them wanted incentive in the form of additional increment (66.67%), allowance for mileage (60.71%) and provision for one special pay every year (51.19%).

Others suggested residential accommodation (47.62%), ten per cent of basic pay as extension allowance (38.10%), honorarium for dress (22.62%) and provision for appreciation letter (20.24%).

They were also required to justify the grant of incentives to them with some concrete arguments. To this they indicated that their job was touring requiring them to be always on the wheels, the education of their children because of movement from one district to the other got adversely affected and involved extra expenditure, medical and club facilities were not available. In addition, it was pointed out that their output was not visible as compared to teaching and research and they had to entertain the farmers with a cup of tea on their (farmers) visits to KGKs. It was also mentioned that they had to deal with different types of farmers which needed patience, skill and hard work on their part.

The experience has shown that most of the faculty members prefer teaching and research jobs and even those who are appointed on extension jobs through selection continue to make attempts for their transfer to teaching and research jobs. As a result, the field extension work suffers for want of competent hands to man the jobs. There is need for delineating the factors which dissuade scientists from extension jobs. The study has shown that DESs were a mix up of faculty members with both teaching and research experience of varied duration (Table 5.10). Accordingly, the team of DESs experience and

qualification-wise was well in order. Under these circumstances, the only issue would be whether they are satisfied on the present job.

The Master's degree constitutes an essential qualifications for the position of DES and DESs with this much qualifications have been observed to carry on extension work with success. The DESs with Doctorate degree may not like to stick to extension jobs unless they have some personal interest to continue to work in KGKs.

To be well trained and knowledgeable in one's subject-matter area is one thing, the extension workers or the scientists who have to carry out extension activities in the field must have proper exposure to extension methodology. Therefore, all the DESs must be given training in the philosophy, principles and methodology of extension (5.2.3.4).

The DESs operated field extension activities only on the basis of their monthly programme of work which was prepared based on the needs of the area and annual programme of work. This set pattern for preparing monthly and annual programme of work, might appear to be a right approach but to further revitalize this procedure there should be some involvement of farmers who are the beneficiaries of the programmes in the preparation of monthly and annual programme of work.

The existing modus operandi for supervising the work of DESs indicate the lack of a proper supervisory and monitory system. Possibly, the supervision by a team of HODs and ULESs

of the allied disciplines might be more effective and economical.

The study has indicated not an appreciable involvement of DESs in research work. Nevertheless, there is ample scope for DESs for taking up adaptive research trials in the field. While extension work should constitute their first line job, undertaking some research trials should also become an integral part of their routine duties. The initiative to involve DESs in research work should come from their respective HODs with due support from the Directorate of Research.

It is an happy augury that most of the DESs did intimate of farming problems to their seniors but the things do not end with this only (Table 5.11). The university's research efforts have to be so tuned that solutions to the problems keep coming to revitalize and reinforce the extension efforts.

It is for the subject-matter HODs to develop an effective mechanism to keep their field extension staff well abreast of latest advances in their profession. At the same time, provision for journals and recent books should also be made in KGK libraries and it should be ensured that these journals and books do get properly utilized by those for whom these have been provided with huge investment of funds.

Like ULESs, training in extension methodology must be given to DESs before their placement in KGKs. In this training, the emphasis should be on practical management of extension activities, like demonstrations, campaigns, group discussions,

meetings, field days, personal contact, presetation of lectures in training and similar other activities. Hall (1992) observed many extension workers seem to have lost their common sense when it comes to the advice they give. They would not take the same advice if they were working on their own farms. They seem to become robots, just simple channels for reproducing the message. Unfortunately, many extension projects have focused on the transfer mechanism concerned only with the efficiency of propagating the message, rather than whether the message makes any sense to farmers.

An examination of the difficulties encountered by DESs and the facilities which they want to be given to them indicates that some of the facilities demanded by them, such as, provision for more funds for TA and POL, adequate transportation facilities, provision for audio-visual aids, recent literature also constitute their difficulties. Singh and Roy (1991) recommended adequate funds for preparation of audio-visual aids, and pointed out due to lack of transport facility, the field visits even in adopted villages were not organized to the desired extent. Most of the other facilities demanded by them like filling up of vacant posts, provision for residential accommodation at KGKs, participation in conferences and workshops, etc., need due attention of the concerned authorities. In fact, none of the facilities mentioned by them can be termed as not-justified a facility (Table 5.13).

In so far as the provision for incentive to faculty members on extension side is concerned, there is need for working out a policy not only for those on extension side but also for the faculty members working in teaching and research schemes. Skewed grant of incentive (that is, if incentive is allowed only to extension scientists), the faculty members in teaching and research might feel neglected on this account. Moreover, there should be a workable policy for shifting members from teaching and research to extension and vice-versa (Table 5.14).

## SECTION 3

### 5.3 Adequacy of Linkages Within and Outside the University for Efficient Feedback

To determine the adequacy of linkages within and outside the university for efficient feedback constituted one of the objectives of the study. As already explained in Chapter IV, the adequacy of linkages refers to the extent of functional interaction between the HOD and ULESs, ULESs and DESs, DESs and the field functionaries of the Department of Agriculture (ADOs, CAOs and SMSs). Obviously then, the adequacy of linkages needed to be examined both within and outside the university.

**5.3.1 Adequacy of Linkages Within the University:** The adequacy of linkages within the university was studied from viewpoint of HODs, ULESs and DESs.

**5.3.1.1 Participation of HODs in Extension Education Activities:** The data were collected about the participation of HODs in extension education activities related to their subject-matter areas organized in the field (Table 5.15).

An examination of Table 5.15 indicates that HODs did participate in activities, namely, method demonstrations (72.22%), result demonstrations (55.56%), trainings organized in villages (55.56%) and at farmers' field (61.11%), and other activities like group discussions (61.11%), meetings with farmers (72.11%), supervisory visits to KGKs (88.89%), supervisory visits to farmers' field (61.11%) besides delivering lectures in training programmes (94.44%) and on

Table 5.15. Participation of HODs in Extension Education Activities

| Sl.No. | Activities | Frequency (N=18) | Percentage |
|---|---|---|---|
| A. | Demonstrations | | |
| i) | Method demonstrations | 13 | 72.22 |
| ii) | Result demonstrations | 10 | 55.56 |
| B. | Training organized | | |
| i) | Organized in villages | 10 | 55.56 |
| ii) | At farmers' field | 11 | 61.11 |
| iii) | At KGKs | 10 | 55.56 |
| C. | Publications | | |
| i) | Research Newsletter | 12 | 66.67 |
| ii) | Bulletins | 12 | 66.67 |
| iii) | Special issue of 'Haryana Kheti' | 12 | 66.67 |
| iv) | Special issue of 'Haryana Farming' | 11 | 61.11 |
| v) | Papers published in 'Haryana Kheti' | 12 | 66.67 |
| vi) | Papers published in 'Haryana Farming' | 10 | 55.56 |
| vii) | Research results given for newsletter | 13 | 72.22 |
| viii) | Research results published in proper form in newspaper or elsewhere | 12 | 66.67 |
| D. | Other Extension Activities | | |
| i) | Group discussion with farmers | 11 | 61.11 |
| ii) | Meetings with farmers | 13 | 72.22 |
| iii) | Supervisory visits to KGKs | 16 | 88.89 |
| iv) | Supervisory visits to farmers' field | 11 | 61.11 |
| v) | Lectures delivered in training programmes | 17 | 94.44 |
| vi) | Lectures delivered to farmers' on other occasions | 12 | 66.67 |

other occasions. In addition, the HODs also contributed papers for 'Haryana Kheti' (66.67%), 'Haryana Farming' (55.56%), and other publications like newsletters (72.22%), research bulletins (66.67%) and also brought out special issues of 'Haryana Kheti' (66.67%) and 'Haryana Farming' (61.11%).

**5.3.1.2 Time Devoted to Extension Education Work:** The study revealed that the HODs devoted only 5 to 10 per cent of their time to extension work which included radio and T.V. talks, lectures in training programmes, setting up of stalls in the exhibition of Kisan Mela, etc.

**5.3.1.3 Extent of Help Available from Directorate of Extension Education in Implementing Extension Education Activities:** The HODs were asked about the extent of help available from the Directorate of Extension Education in implementing the extension education activities of their departments.

While two-third of them (66.67%) vouched that the extent of help available to them from the Directorate of Extension Education was satisfactory, 22.22 per cent reported it to be good. The remaining 11.11 per cent pointed out that the extent of help available was not to the required extent.

**5.3.1.4 Weaknesses Observed by HODs in Implementing Extension Education Programme:** The weaknesses pointed out by HODs in implementing extension education work of their respective departments are presented in Table 5.16.

Table 5.16. Weaknesses Observed by HODs in Implementing Extension Work

| Sl.No. | Weaknesses | Frequency (N=18) |
|---|---|---|
| 1. | Lack of budget for purchase of inputs | 8 |
| 2. | Lack of advanced training facilities for field staff | 7 |
| 3. | Lack of suitable policy for transfer, reward and punishment | 6 |
| 4. | Inadequate interaction between extension and research staff | 6 |
| 5. | Limitation of extension work to 3 villages only | 5 |
| 6. | Shortage of extension staff (some DESs are on study leave) | 5 |
| 7. | Inadequate coordination with government field functionaries | 4 |
| 8. | Lack of skill for conducting demonstrations | 4 |
| 9. | Lack of interest on the part of DESs to give feedback on the farming problems to the department | 3 |
| 10. | No provision for DESs for undertaking Agricultural Meteorology, Plant Breeding and Foods and Nutrition extension work | 3 |
| 11. | Delayed communication of extension programmes organized at KGks which makes participation difficult | 3 |
| 12. | Lack of audio-visual aids | 3 |
| 13. | Lack of leaflets, handouts, etc., on important topics | 3 |
| 14. | Unwilling extension worker | 3 |
| 15. | Non-cooperation of farmers on occasions and who always want free and more and more supply of inputs | 3 |
| 16. | Lack of proper work culture because of all round deterioration | 2 |
| 17. | Deviation from the desired mandate of farm advisory service | 2 |
| 18. | Lack of polyclinics at district level | 2 |
| 19. | Failure to prepare actual farm plan | 1 |
| 20. | Lack of farming system approach | 1 |

A perusal of Table 5.16 will indicate that subject-matter Heads of Departments based on their actual observations in implementing extension education work of their department pointed out a number of weaknesses which included lack of budget (8), lack of advanced training facilities for field staff (7), lack of suitable policy for transfer, reward and punishment (6), inadquate interaction between extension and research staff (6), limitation of extension work to three villages (5), shortage of extension staff (5), inadequate coordination with government field functionaries (4), lack of skill for conducting demonstrations (4), lack of interest (3), delayed communication of extension programmes (3), lack of audio-visual aids (3), lack of leaflets, handouts, etc., on important topics (3), unwilling extension workers (3), non-cooperation of farmers on occasions (3), lack of proper work culture (2), deviation from the desired mandate of farm advisory service (2), lack of polyclinics at district level (2), failure to prepare actual farm plan (1) and lack of farming system approach (1).

**5.3.1.5 Steps for Developing Adequate Linkages from the Viewpoint of HODs:** The steps suggested by HODs which need to be promptly followed for strengthening the linkages in the existing technology transfer model are presented in Table 5.17.

A perusal of Table 5.17 will indicate that HODs based on their extension experience suggested steps which need to be promptly followed for strengthening the linkages were more budgetary provision for extension work (10), more training

Table 5.17. Steps for Developing Adequate Linkages from the Viewpoint of HODs

| Sl.No. | Steps | Frequency (N=18) |
|---|---|---|
| 1. | More budgetary provision for extension work | 10 |
| 2. | More training facilities for farmers | 8 |
| 3. | Strengthening of linkages between research and extension staff | 6 |
| 4. | Association of DESs with the developmental committees at district headquarters | 5 |
| 5. | Provision for a definite policy of transfer | 5 |
| 6. | Making extension positions attractive by providing incentives | 5 |
| 7. | Restoration of duties as per job-chart | 4 |
| 8. | Strengthening of mobility, manpower, etc. | 4 |
| 9. | More audio-visual aids facilities | 4 |
| 10. | Provising for positions for DESs Agricultural Meteorology, Foods and Nutrition and Plant Breeding | 3 |
| 11. | Extension awareness campaign through media | 3 |
| 12. | Extension team should comprise one scientist in class I rank, two scientists in class II rank and supporting staff | 3 |
| 13. | Facilities for children's education at KGKs | 2 |
| 14. | Inclusion of Extension Education subject in the school curriculum | 2 |
| 15. | Entire extension system should be headed, administered and supervised by persons with Extension Education qualifications | 2 |
| 16. | Well defined targets and action plan | 1 |

facilities for farmers (8), strengthening the linkages between research and extension staff (6), association of DESs with the developmental committees at district headquarters (5), provision for a definite policy of transfer (5), making extension positions attractive by providing incentives (5), restoration of duties as per job-chart (4), strengthening of mobility, manpower, etc. (4), audio-visual aids facilities (4), extension awareness campaign through media (3), providing for positions of DESs Agricultural Meteorology, Foods and Nutrition and Plant Breeding (3), extension team should comprise supporting staff (3), facilities for children's education at KGKs (2), inclusion of Extension Education subject in the subject curriculum (20, entire extension system should be headed, administered and supervised by persons with Extension Education qualifications (2) and well defined targets and action plan (1).

**5.3.1.6 Shortcomings Observed by ULESs on Supervisory Visits:** The shortcomings observed by ULESs on their visits to KGKs were found to be as follows:

i) Lack of maintenance of records

ii) Lack of analysis of data/information

iii) Delay in preparation of monthly progress report

iv) Lack of interest in writing daily diary

v) Lack of transport and other facilities

vi) Lack of funds for laying out demonstrations, trials, trainings, etc., with KGKs

vii) Non-availability of good planting material for establishment of orchard

viii) Non-availability of concerned scientists at KGK

ix) Lack of management of good orchard

x) Occurrence of major problems in fruit plants

xi) Low adoption of improved recommended practices by the farmers

xii) Lack of proper maintenance of visitors' register

xiii) Lack of proper response of collaborating DESs

xiv) Lack of cooperation from officials of State Department of Agriculture and Animal Husbandry

xv) Limited sphere of activity of DESs with the restriction in their movement to three adopted villages only

xvi) Lack of resources with the farmers which decelerates the adoption of recommended practices

xvii) Failure to properly follow month-wise schedule of work

xviii) Limited provisions for travelling allowance for DESs

xix) Lack of independent laboratory for plant protection in each KGK

**5.3.1.7 How ULESs Help DESs in Overcoming Shortcomings?:** The comments of ULESs are invited to find out as to how did they help DESs in overcoming the shortcomings observed by them on their visits to KGKs. Some of the steps taken by them in overcoming the shortcomings were reported to be as follow:

i) DESs are impressed upon for maintaining proper record of the work done by them

ii) administrative action where needed

iii) Issuance of reminders, guidelines, etc.

iv) Proper maintenance of daily diary

v) Supply of inputs where required

vi) Transfer of latest technology

vii) Supply of package of practices to DESs

viii) Provision for pocket calculator to be provided to each of the DESs for analysis of data (particularly for Farm Management)

**5.3.1.8 Popularisation of Research Findings Among Farmers:** The ULEss were required to indicate the methods, ways and means which they were following for popularising the latest research findings of applicable value among the farmers. The various methods being used by them are presented in Table 5.18.

Table 5.18. Popularisation of Research Findings Among Farmers

| Sl.No. | Methods | Frequency (N=12) |
|---|---|---|
| 1. | Demonstrations | 8 |
| 2. | District, sub-division and village level training camps | 7 |
| 3. | Publication of popular articles in Haryana Kheti, haryana Farming and other monthly magazines | 6 |
| 4. | Campaigns and Gyan Diwas | 6 |
| 5. | Distribution of leaflets and handouts on occasions like Kisan Mela, Farm Darshan, etc. | 6 |
| 6. | Group meetings | 4 |
| 7. | Radio talks | 4 |
| 8. | Seminars, conferences, symposia, etc., for farmers | 4 |
| 9. | Field trials | 3 |
| 10. | Personal contact | 2 |

An examination of Table 5.18 will indicate that the methods being used by ULESs for popularising the latest research findings among farmers were demonstrations (8), training camps (7), publications in the form of popular articles (6), distribution of leaflets and handouts (6), organization of campaign and gyan diwas (4), group meetings (4), radio talks (4), seminars, conferences, symposia, etc., for farmers (4), field trials (3) and personal contact (2).

**5.3.1.9 Advisory Service Through Correspondence:** The data indicated that all the ULESs were approached by farmers through letters for seeking advice on farming problems. On an average, all the ULESs claimed to be receiving 20 to 30 letters from farmers in an year with the exception of one who received 6 to 7 letters.

On further probing about the advice or feedback sought by the farmers through correspondence, it was indicated that the farmers wrote to them for technical guidance (11), personal problems (6) and demand for inputs, such as, quality seeds, fungicides or for a specific training (4).

It was further observed that the letters of the farmers were replied by ULESs within a week or two.

**5.3.1.10 Interaction of ULESs:** The help rendered by training unit and farm information and communication units in the discharge of their duties might be having a bearing on the performance of ULESs. They were asked as to in what way these units of the Directorate of Extension Education were helping them.

Regarding training unit some training programmes, namely, training on vegetables for farmers and SMSs, refresher courses for DESs and training for mango growers were reported to be organized. However, it was pointed out that prior consultation of ULESs in the organization of these training programmes was not taken. The help available from the farm information and communication units was the publication of leaflets, handouts, etc.

**5.3.1.11 Touring by DESs:** The study indicated that the average number of days spent on tour by DESs ranged from 6 to 10 in case of majority of them (78.57%). The remaining 21.43 per cent reported only upto 5 days on this account.

Their opinion was obtained about the number of days they should be allowed to tour in a month. More than half of them (53.57%) proposed around 10 days tour and the remaining suggested a tour of more than 10 days.

The study further revealed that the DESs were mostly touring in groups rather than alone and mostly the tour was being undertaken in university vehicles.

**5.3.1.12 Office Calls by Farmers to DESs:** The average number of farmers in a month who paid office calls at KGKs varied from DES to DES. While more than three-fifth of them (60.71%) reported that upto 40 farmers contacted them at KGKs in a month, the remaining 39.29 per cent claimed office calls by 60 or more farmers.

**5.3.1.13 Collaborating Agencies and Departments:** The agencies and departments whose collaboration was obtained by DESs during the last one year were the Departments of Agriculture, Animal Husbandry, Cooperative, Horticulture, Health and Public Relations, HSDC, HAFED, IADP, IFFCO, ICDS, KRIBHCO, Mini Banks, 'Nehru Yuva Kendras', NAFED, NFL, 'Village Panchayats' and YMCA.

In a separate question, they were asked to indicate the names of the agencies and departments whose collaboration was needed by them but it was not available. To this, negative responses were received from the each one of them.

**5.3.1.14 Methods Adopted by DESs to Bring Home Feedback to Farmers:** The DESs were required to indicate the steps taken or methods adopted by them to bring home feed back on the problems to farmers.

Their responses on this account indicated various measures taken by them which included discussion of the problems with the farmers, demonstration on relevant topics, distribution of leaflets with adequate information related to the problems, supply of required information through 'Krishi Pramarsh Patra', home and field visits, organization of trainings in villages, conducting of group meeting with farmers, organization of Gyan Diwas, field days and mini kisan mela in villages.

**5.1.3.15 DESs Viewpoints for Making KGKs Popular:** The respondents were required to suggest at least ten measures which in

their opinion would make KGKs quite popular among farmers. The suggestions given by DESs on this account are given in Table 5.19.

Table 5.19. DESs Viewpoints for Making KGKs Popular

| Sl.No. | Measures | Frequency (N=84) | Percentage |
|---|---|---|---|
| 1. | Provision for sale counters of HYVs seeds, fertilizer, insecticides, pesticides, etc. | 68 | 80.95 |
| 2. | Coverage of whole of the district by KGK | 52 | 61.90 |
| 3. | Facilities for exhibition, plant clinic, etc. | 50 | 59.52 |
| 4. | Frequent organization of exhibitions and mini Kisan Melas in a cluster of villages by KGKs | 46 | 54.76 |
| 5. | Training facilities for farmers at KGKs | 38 | 45.24 |
| 6. | Availability of small scale implements at KGKs for conducting trials | 26 | 30.95 |
| 7. | Organization of seminars, workshops, etc., for farmers and field fucntionaries at regional level by KGKs | 25 | 29.76 |
| 8. | Waiting room and stay facilities for farmers at KGKs | 16 | 19.05 |
| 9. | Provision for facilities like A.I., vaccination, etc., at KGKs | 16 | 19.05 |
| 10. | Organization of clinical camps in villages by KGKs | 15 | 17.86 |
| 11. | Coverage of KGK programmes in radio, television, newspapers, etc. | 13 | 15.48 |
| 12. | Organization of farmers visits to the university campus by DESs | 8 | 9.52 |

As the Table indicates the DESs suggested provision for sale counters of HYVs seeds, fertilizers, insecticides, pesticides, etc., (80.95%), coverage of whole of the district for extension work (61.90%), facilities for exhibition, plant clinic, etc. (59.52%) and frequent organization of exhibitions and mini 'kisan mela' in a cluster of villages (54.76%).

The other measures included training facilities (45.24%), availability of small scale implements (30.95%), organization of seminars, workshops, etc., (29.76%), waiting room and stay facilities for farmers at KGKs (19.05%), provision of facilities like A.I., vaccination, etc., (19.05%), organization of clinical camps in villages (17.86%), coverage of KGK programmes in radio, television, newspapers, etc., (15.48%) and organization of farmers visits to the university campus by DESs (9.52%).

The participation of HODs in extension education activities seems to be have been there but this participation needs to be further intensified (Table 5.15). The HODs, as per provisions need to devote one-third of their time to field extension work. The programme of HODs participation in extension work need to be on the basis of a set pattern rather than being a casual matter.

Th weaknesses observed by HODs in implementing extension education work of the department have in fact, indicated not only some missing links as well as weak linkages (Table 5.16). Inadequate interaction between extension and research staff and

inadequate coordination with field functionaries has also been pointed out. Reported weaknesses also include lack of skill for conducting extension activities, lack of farming system approach and lack of interest of extension staff in providing needed feedback on the farming problems. Several of the weaknesses indicate lack of routine facilities. Regular feedback maintains the stability and equilibrium of a communication system (Power, 1960).

The most of the suggestions put forward by HODs appear to be of constructive nature (Table 5.17). Some of the suggestions, such as, provision for definite policy of transfer, restriction of duties as per job chart, provision for proper meanks for mobility of extension staff, well defined targets for different extension activities and preparation of action plan, strengthening of linkages between research and extension staff by developing proper channels for communications, etc., need to be considered on priority. Several of the suggestions given by HODs have also been asked for by ULESs and DESs. What is needed is to pool important suggestions and work for their implementation. To mobilise HODs' effective participation in extension activities due credence need to be given to their viewpoints.

The shortcomings observed by ULESs on their visits to KGKs and the steps taken by them to overcome the shortcomings need to be properly looked into. There seems to be a need for issuing some standing instructions to DESs in regard to the

shortcomings. The shortcomings should be thoroughly discussed with DESs in the meetings held by DEE, HODs and ULESs. Every issue whether related to inputs, collaboration or maintenance of records should be sorted out and settled for future guidance (5.3.1.6).

The study has shown that the ULESs have been popularising the latest research findings among farmers through different types of extension activities (Table 5.18). What is most important in this direction is that maximum participation of farmers should be obtained in extension activities and that the participation of farmers proves beneficial to them and when they return they feel themselves better equipped with the knowledge and skill required for scientific production. Alzahranl (1992) reported that most important methods of transferring agricultural technology were farm visits, demonstration, extension meetings and television programmes.

The seeking of advice on farming problems through correspondence should be encouraged among farmers as they can get the advice with least investment at their doorstep. However, they should be motivated to write to DESs of their respective districts whom they can contact and discuss about the problems as and when needed (5.3.1.9). Educational level and age had an impact on the utilization of different extension methods (Alzahranl, 1992).

The training unit should take the ULESs in confidence before organizing any training programme. Likewise, there should be clearcut policy as to how farm information and

communication unit can render help to ULESs in carrying out their extension activities in the field.

Though KGKs have now become in full swing yet to further promote the utilization of services and facilities being made available at these 'Kendras' special efforts in the form of "Farmer Contact Programmes" should be organized by DESs on regular basis. Obviously, this would need more tour on their part for which funds have to be made available (5.3.1.11).

The number of farmers who pay office calls to KGKs is not appreciable. The DESs need to create a friendly attitude towards the farmers so that the scores on office calls increase manifold. This is, particularly, important for the reason that the tours of the DESs have now been limited to only three adopted villages. What is needed is that farmers avail the farm advisory service from all over the district.

It was quite interesting to find that the extension activities were carried out by DESs in collaboration in a number of departments and agencies (5.3.1.13). According to them, the required level of collaboration was available from all the concerned departments for the purpose.

The measures suggested by DESs for making KGKs popular among farmers need to be carefully examined for taking appropriate action (Table 5.19). Some of the measures like provision for sale counter for inputs, availability of small scale implements such as drill, spray pump, debeakers, etc., to farmers on the one hand will promote adoption of recommended

implements and on the other hand increase popularity scores of KGK among the farmers. Exhibitions, mini kisan melas, clinical camps, etc., are some of the activities which attract a large number of farmers and do make the KGKs popular among them. Proper training with sufficient infrastructural facilities will help to boost up the morale of extension personnel which often leads to better satisfaction and efficient performance on the job.

**5.3.2 Adequacy of Linkages Outside the University:** The field functionaries of the Department of Agriculture, particularly, ADOs, CAOs and also SMSs shouldered the responsibility of carrying out extension activities related to crop production besides having a live contact with the farmers. In other words, more would be the contact of these functionaries with the farmers, higher would be the intensity of taking up extension activities in villages. Nevertheless, the problem which would roadblock their performance of extension activities in villages would adversely affect their day to day work purported to be carried out in villages. Therefore, it was inevitable to ascertain the various problems which they encountered in carrying out extension activities in villages. The Table 5.20 gives an account of such problems.

A study of Table 5.20 will indicate that there were several problems which were being encountered by a majority of the field functionaries. These included problems of mobility (94.00%), lack of job satisfaction (94.00%), non-availability of audio-visual aids (92.00%), frequent transfer of the

Table 5.20. Problems of Field Functionaries of Department of Agriculture in Carrying Out Extension Work

| Sl.No. | Problems | Frequency (N=100) | Percentage |
|---|---|---|---|
| 1. | Problem of mobility | 94 | 94.00 |
| 2. | Lack of job satisfaction | 94 | 94.00 |
| 3. | Non-availability of audio-visual aids | 92 | 92.00 |
| 4. | Frequent transfers of the department | 90 | 90.00 |
| 5. | Non-availability of funds for demonstration plots | 82 | 82.00 |
| 6. | Lack of opportunities for participating in seminars, conferences, workshops, etc. | 76 | 76.00 |
| 7. | Lack of physical facilities for routine work (space for office, stores, furniture, etc.) | 70 | 70.00 |
| 8. | Required to carry out extraneous duties like family welfare, small savings, etc. | 70 | 70.00 |
| 9. | Lack of recognition for the hard work done | 70 | 70.00 |
| 10. | Pressure of seniors for distribution of inputs like HYVs seeds, fertilizers, etc., to farmers of their choice | 40 | 40.00 |

department (90.00%), non-availability of funds for demonstration plots (82.00%), lack of opportunities for participating in seminars, conferences, workshops, etc., (76.00%), lack of physical facilities for routine work (70.00%), required to carry out extraneous duties like family welfare work, small savings, etc., (70.00%), lack of recognition for the hard work done (70.00%) and pressure of seniors for distribution of

inputs like HYVs seeds, fertilizers, etc., (40.00%). Technology transfer was a full time job and cannot be undertaken with only part time attention to agriculture (Singh, 1985). The author further observed that transfer of technology was not merely a question of going to the farmers and telling them what to do. The extension workers should also listen to their problems, should be able to demonstrate, what he preaches and should also be able to advice them regarding resource of inputs and provide them with other related information.

An examination of the problems encountered by the functionaries of the Department of Agriculture while working with farmers and the like will indicate that more or less all the problems pointed out by them adversely affect the linkages limiting or restricting the percolation of technology. A field functionary to be really effective on his job should be mobile. To make them mobile, a properly drawn up scheme can be prepared for providing loans to the field functionaries for the purchase of vehicle in phases every year.

While there is a need for delineating the factors which lead to the lack of job satisfaction of ADOs, the earlier reports indicate that poor working conditions, lack of recognition of the work done and lack of reward system and promotional chances adversely affect the level of job satisfaction (Rao and Sohal, 1978). Majority of extension personnel have moderate level of job satisfaction (Verma, 1987).

Too emphasis is laid on the use of audio-visual aids while organizing extension activities in villages. This emphasis need to be supported in two ways. Firstly, cheap and easy-to-carry audio-visual aids should be provided to the field functionaries, and secondly, they should be properly trained in the use of these aids. It has been well established that properly laid down demonstrations on farmers' fields play a significant role in the transfer of technology. Obviously, this calls for sufficient funds for the purpose.

The Department of Agriculture should have a popular and sound policy for transfer of field fucntionaries. Frequent transfers, in fact, undo whatever work has been carried out by the field functionaries as the new incumbents have to start afresh and the rapport developed by them with the farmers over a period of time during their stay does not serve a useful purpose.

The ADOs and CAOs should also have occasions to participate in seminars, conferences and workshops. They should not be required to carryout extraneous type of duties like that of family welfare work and small savings as these types of jobs on the one hand lead to the wastage of their time which could otherwise be devoted to the development of agriculture, their, rapport with their clientele also gets affected on the other hand. In other words, their linkage with the farmers gets weakned. The seniors should distribute the inputs through field functionaries only on the basis of a specified policy so that

the benefit of these inputs percolate to really deserving farmers. Vidyarthy (1976) suggested that agricultural universities should provide authentic information in systematic manner to extension agency at all levels. As extension was a process of extending research findings to the farmers, there has to be a close liaison between those responsible for research work and those who extend research findings in the field.

Conclusively, in-built mechanisms need to be developed to overcome the problems and the lapses broughtout by the study.

**5.3.2.1 Crop Production Problems Observed by Field Functionaries:** The Table 5.21 gives an account of the crop production problems observed by field functionaries while working with the farmers.

Table 5.21. Crop Production Problems Observed by Field Functionaries

| Sl.No. | Problems | Frequency (N=100) | Percentage |
|---|---|---|---|
| 1. | Non-availability of HYVs seeds | 82 | 82.00 |
| 2. | Problem of weed management | 80 | 80.00 |
| 3. | Irrigation and water management | 76 | 76.00 |
| 4. | Integrated nutrient management | 76 | 76.00 |
| 5. | Integrated control measure for insect-pests | 75 | 75.00 |
| 6. | Lack of availability of technology about low cost and non-monetary inputs in crop production | 56 | 56.00 |

A significant majority of the field functionaries pointed out non-availability of HYVs seeds (82.00%), problem of weed management (80.00%), irrigation and water management (76.00%), integrated nutrient management and integrated control measure for insect-pests (75.00%). More than half of them (56.00%) also reported lack of availability of technology about low cost non-monetary inputs in crop production.

Of the several problems observed by field functionaries while working with farmers, several of the problems might be overcome with proper planning. High yielding varieties seeds constitutes basic needs for scientific crop production. Similar is the case with weed management, integrated nutrient management, control of insect-pests, etc. The field functionaries need to be trained in low cost technology communication techniques to promote better linkages and contacts with their clientele. The training helps in building up definite skills and confidence among the extension workers and provide them new clues to take some of the intricate field problems in better ways (Jati and Dash, 1974).

**5.3.2.2 How the Field Functionaries Overcome the Problems?:** Having ascertained the problems of the field functionaries in carrying out extension activities it was considered necessary to determine as to how they did overcome the problems. The study revealed that a significant majority of them (86.00%) got rid of the problems by simply informing the seniors. The other way out according to the respondents, was to first work with

the progressive farmers and known persons who were easy to cooperate or accepted the recommendations without much persuation (62.00%). Subsequently, their success stories were used to persuade others. On occasions collaboration of university experts stationed at KGKs was sought to have discussion with the farmers (26.00%).

The concerned authorities of the Department of Agriculture in their monthly and other meetings as well as on their supervisory visits should discuss the problems with the field functionaries and provide practical solutions to their problems as far as possible.

**5.3.2.3 Help from University for Professional Enrichment:** To determine the adequacy of linkages between the field functionaries and the university for their professional enrichment the data were collected (Table 5.22).

Interestingly, the field functionaries acknowledged both direct and indirect help from HAU for their professional enrichment.

The perception of direct help by all the respondents included training programmes for them and 'Agricultural Officers Workshop' for 'Rabi' and 'Kharif' seasons. However, the ADOs and CAOs who were not directly involved in these workshops expressed their desire for participation.

The other help from the university as perceived by the respondents included occasions for useful discussion with specialists at KGKs (82.00%), supply of 'Krishi Pramarsh Patra' (80.00%), joint field visits for supervising 'On Farm Trials'

Tanle 5.22. Help Available from University for Professional Enrichment

| Sl.No. | Help available | Frequency (N=100) | Percentage |
|---|---|---|---|
| A. | DIRECTLY | | |
| 1. | Imparting training programmes to field functionaries | 100 | 100.00 |
| 2. | Organizing AOWs, for Rabi and Kharif seasons | 100 | 100.00 |
| 3. | Occasions for useful discussions with specialist at KGKs | 82 | 82.00 |
| 4. | Supply of Krishi Pramarsh Patra | 80 | 80.00 |
| 5. | Joint field visits for supervising 'On Farm Trials' | 70 | 70.00 |
| 6. | Laying out demonstrations at farmers' field | 22 | 22.00 |
| 7. | Zonal Extension Research Advisory Committee meetings | 20 | 20.00 |
| B. | INDIRECTLY | | |
| 1. | Popular articles published in Haryana Kheti/Haryana Farming | 90 | 90.00 |
| 2. | Supply of leaflets on important topics related to crop and livestock production | 90 | 90.00 |
| 3. | Providing technical knowhow for crop and livestock production through mass media and papers published by HAU scientists in magazines and journals outside the university | 78 | 78.00 |
| 4. | Package of Practices for scientific farming | 76 | 76.00 |

(70.00%), laying out demonstrations at farmers' fields (22.00%), and 'Zonal Extension Advisory Committee' meeting (20.00%).

All these activities and occasions provide direct linkage points for professional enrichment.

As to how the university indirectly helped the field functionaries in their professional enrichment was perceived to be through popular articles published in 'Haryana Kheti' and 'Haryana Farming' (90.00%), supply of leaflets on important topics related to crop and livestock production (90.00%) providing technical knowhow for crop and livestock production through mass media and papers published by HAU scientists in magazines and journals outside the university (78.00%) and package of practices for scientific farming (76.00%).

The study has clearly broughtout some direct and indirect linkage points between the university and the field functionaries which as perceived by the later help them in their professional enrichment. To have adequate linkages the functional aspects related to these points should be so manipulated that would lead to stronger linkages. The most important step in this direction would be to make field functionaries feel that the university is for their betterment and they should feel free for establishing contacts with the specialists at various levels for their professional enrichment. Each one of them should be supplied with package of practices on concessional rates. They should have access to 'Haryana Kheti'. They need to be supplied 'Krishi Pramarsh

Patra' regularly. There should be provision for mini library at a convenient focal points. The seniors in their monthly meetings also need to devote some of the time for technical discussions. It should be brought home to all the field functionaries that it was very essential to keep abreast of the latest advances in crop farming and that consultation of literature and discussion with the subject-matter specialists was necessary in this direction. Mass media exposure of extension personnel was found to be significantly associated with their level of knowledge about technology. Thus, scientists in the nearest agricultural universities or research institutes should prepare special bulletin on latest technologies, which could be mailed periodically to the extension personnel of the region. Local stations of All India Radio and Doordarshan should give consideration for producing special programmes exclusively for extension personnel to equip them with modern farm technology.

**5.3.2.4 Contact with University:** To establish if an initiative was taken by field functionaries to maintain contacts with the university at their individual level data were collected.

It was found that 53.00 per cent of them did maintain contacts with the university. The remaining 47.00 per cent replied in negative. The information was further collected to find out as to how did they maintain contacts with the university. While 88.68 per cent of them revealed that whenever they needed to seek some technical guidance they contacted the

specialists at KGKs and research stations of the university through personal visits, the remaining 11.32 per cent of them claimed to be seeking technical guidance from university scientists through correspondence.

It is interesting to find that the field functionaries do maintain contacts with the university scientists for seeking technical guidance both through personal contacts as well as correspondence. This speaks of functional interaction between the field functionaries and the university scientists. Promotion of mutual benefits leading to professional enrichment and proper motivation will further strengthen these linkages.

**5.3.2.5 Percolation of Information Through AOWs:** On enquiry, if the important information given to the senior officers of the department before 'Rabi' and 'Kharif' seasons in the AOWs were passed on to the field functionaries operating at the grass-root level, it was claimed by all the respondents in affirmative. Indeed, it is an happy augury.

On further probing as to how the information was passed on to the field functionaries, all the respondents indicated that it was ensured through fortnightly trainings which were organized for CAOs and ADOs at the sub-divisional headquarters, when on tour in the area and sometimes through handouts containing important recommendations, the informations were passed on.

As such, it is revealed that the field fucntionaries are satisfied with whatever information percolates to them through their seniors after 'Rabi' and 'Kharif' AOWs. A separate study

may be needed to determine the exact degree of percolation of the recommended practices to the field functionaries. Whatever may be the case, under these circumstances to achieve good results or for quick transfer of the information to the field functionaries, the concerned officials who attend the workshops should hold a one day meeting with the field functionaries working in their jurisdiction and should discuss the recommendations with them. A brief note containing important recommendations should also be circulated in the meeting to all concerned for their record and reference.

**5.3.2.6 Expectation from the University:** The opinions of the field functionaries were invited as to what the university should do for promoting scientific farming. Their responses are presented in Table 5.23.

The expectations of field functionaries from the university included supply of package of practices in the form of tips to save time and facilitate pinpointed education of field functionaries on important recommendations for Rabi and Kharif crop production (95.00%), organization of short duration trainings for every crop season for CAOs and ADOs (95.00%), supply of HYV seeds (92.00%), laying out of demonstrations in maximum number of villages (90.00%), evolving of disease resistant varieties of crops (82.00%), developing of low cost technology to ensure its maximum possible adoption by small and marginal farmers (78.00%), training of field functionaries in extension methodology and communication (72.00%) and training of field functionaries in the use of audio-visual aids (36.00%).

Table 5.23. Expectations from the University

| Sl.No. | Expectations | Frequency (N=100) | Percentage |
|---|---|---|---|
| 1. | Supply of package of practices in the form of tips to save time and facilitate pinpointed education of field functionaries on important recommendations for Rabi and Kharif crop production | 95 | 95.00 |
| 2. | Organization of short duration trainings for every crop season for CAOs and ADOs | 95 | 95.00 |
| 3. | Supply of HYVs seeds | 92 | 92.00 |
| 4. | Laying out of demonstrations in maximum number of villages | 90 | 90.00 |
| 5. | Evolving of disease resistant varieties of crops | 82 | 82.00 |
| 6. | Developing of low cost technology to ensure its maximum possible adoption by small and marginal farmers | 78 | 78.00 |
| 7. | Training of field functionaries in extension methodology and communication | 72 | 72.00 |
| 8. | Training of field functionaries in the use of audio-visual aids | 36 | 36.00 |

The expectations of the field functionaries from the university (Table 5.23) seem to be justified. The supply of package of practices in the form of tips to them is necessary. However, this responsibility should rests with the Department of Agriculture. The training of field functionaries for every crop season is already envisaged in 'Training and Visit

System'. What perhaps may be needed is to streamline the same. Their expectations for the supply of HYVs seeds could be due to lack of information on them about the objectives of the university. They need to be correctly and fully informed about the organizations with whom the responsibility of producing HYVs seeds rests. Since the credibility of demonstrations has been well established, the demand for laying out of demonstration plots in maximum number of villages has come up.

Agricultural scientists are already working for evolving disease resistant varieties of crops. This is an area where time limitations cannot be put up and the things take their own time. To come up with fixed packages of technology is not only arrogant, its ignorant. The same technical package is often maintained year in, year out, and yet the ratio of output to input prices for, say maize and fertilizer, swings wildly (Hall, 1992). Developing of low cost technology is now a popular demand and scientists are already working in this direction. Trainings of field functionaries in extension methodology and in the use of audio-visual aids is a dire necessity to enable them to carry out their extension jobs efficiently. Several of the aforementioned steps will go a long way in establishing adequate linkages between the field functionaries and the farmers.

## SECTION 4

### 5.4 Farmers' Perception of the Technology Transfer System of the University

This section contains profile of farmers who had visited KGK by their perception on their important aspects related to the transfer of technology including the problems encountered by them in availing the services being made available to them through KGKs and also their viewpoint about the facilities which should be provided at KGKs.

**5.4.1 A Profile of Farmers Visiting KGKs:** To have a glimps of the farmers who had visited KGK, data pertaining to some of the variables related to their profile was collected and has been presented below:

**5.4.1.1 Age:** A majority of the respondents were found to be in low (36.00%) to medium (42.00%) age group. The remaining (22.00%) were in the high age group.

**5.4.1.2 Education:** While half of the respondents (50.00%) had medium level of education, 26.00 per cent of them had high level of education. The remaining 24.00 per cent carried low level of education which included 10 illiterate respondents.

**5.4.1.3 Size of Land Holding:** Sixty per cent of the respondents owned low size of land holdings and the remaining possessed medium and high land holdings (20.00% in each case).

**5.4.1.4 Membership Status:** Sixty per cent of the respondents were members of one or the other organization (mostly of cooperative societies). The remaining 40.00 per cent were without membership status.

**5.4.1.5 Farming Status:** A significant majority of the respondents were undertaking self farming (86.00%). The remaining 14.00 per cent were found to be the share croppers.

A majority of the farmers who have been visiting KGKs were observed to be in low to medium age group (78.00%), possessed medium to high education (76.00%), low to medium land holding (80.00%), resorted to self farming (86.00%), with a membership status of one or more organizations (60.00%).

**5.4.2 Frequency of Visits to KGKs:** Almost one-third (32.00%) respondents have been visiting KGKs every fortnight. Those who visited once a month or once in two months were 25.00 and 21.00 per cent, respectively. such of the farmers who visited the KGKs every week were only 6.00 per cent. Likewise, the number of respondents who visited once in three months and more than three months (8.00%) was comparatively less.

The study has indicated that more than three-fourth of the respondents (78.00%) did visit KGKs at least once or more than that in a period of two months.

**5.4.3 Purpose for Visiting KGKs:** A perusal of Table 5.24 will indicate that more than half of the respondents (56.00%) visited KGKs to get information on the latest technology for crop or livestock production.

The others indicated the specific purpose of visit to know about the diseases of vegetables and their control measures (24.00%), to get seeds for demonstration plots (20.00%), use of fertilizers, insecticides, etc., and wheat and

Table 5.24. Purpose for Visiting KGKs

| Sl.No. | Purpose | Frequency (N=100) | Percentage |
|---|---|---|---|
| 1. | To get information on latest technology for crop or livestock production | 56 | 56.00 |
| 2. | To know about vegetable diseases and their control measures | 24 | 24.00 |
| 3. | To get seeds for demonstration plots | 20 | 20.00 |
| 4. | To consult about use of fertilizers, insecticides, etc., and wheat and paddy diseases | 16 | 16.00 |
| 5. | Guidance about potato cultivation | 14 | 14.00 |
| 6. | To consult about new varieties of crops | 14 | 14.00 |
| 7. | To know about sowing time of crops of different varieties | 10 | 10.00 |
| 8. | Guidance for diagnosis of animal diseases | 6 | 6.00 |
| 9. | To discuss about new varieties of fruit plants | 4 | 4.00 |
| 10. | To consult about poultry farming | 2 | 2.00 |
| 11. | To consult about bee-keeping | 2 | 2.00 |
| 12. | To discuss about nutritional deficiency in animals | 2 | 2.00 |

paddy diseases (16.00%), guidance about potato cultivation (14.00%), to consult about new varieties of crops (14.00%), to know about sowing time of crops of different varieties (10.00%), guidance for diagnosis of animal diseases (6.00%), to discuss about new varieties of fruit plants (4.00), and to

consult about poultry, bee-keeping and nutritional deficiency in animals (2.00% each).

It may be noted that an appreciable number of farmers who visited KGKs did consider it as a source of information for getting latest scientific knowledge for crop and livestock production.

**5.4.4 Utilization of Different DESs by Farmers:** The data about the utilization of different DESs stationed at KGKs were collected (Table 5.25).

Table 5.25. Utilization of Different DESs by Farmers

| Sl.No. | Discipline | Frequency (N=100) | Percentage |
|---|---|---|---|
| 1. | Plant Pathology | 78 | 78.00 |
| 2. | Agronomy | 72 | 72.00 |
| 3. | Entomology | 68 | 68.00 |
| 4. | Vegetable Crops | 56 | 56.00 |
| 5. | Farm Management | 52 | 52.00 |
| 6. | Horticulture | 42 | 42.00 |
| 7. | Soil Science | 40 | 40.00 |
| 8. | Agricultural Engineering | 14 | 14.00 |
| 9. | Animal Sciences | 26 | 26.00 |
| 10. | Veterinary Sciences | 48 | 48.00 |
| 11. | Home Science | 6 | 6.00 |

The utilization of different DESs stationed at KGKs by farmers in descending order was found to be Plant Pathology (78.00%), Agronomy (72.00%), Entomology (68.00%), Vegetable Crops (56.00%), Farm Management (52.00%), Horticulture (42.00%)

Soil Science (40.00%), Agricultural Engineering (14.00%), Animal Sciences (26.00%), Veterinary Sciences (48.00%) and Home Science (6.00%).

The Plant Pathology and Entomology constitutes plant protection group and the importance of plant protection in agriculture farming is self-explanatory. Since farmer needs education/information on agronomical practices, particularly, for crops like wheat, paddy, etc., the DES Agronomy is the most sought after Specialist after those of the plant protection group. Vegetable crops constitute cash crops and for optimizing production specialists' guidance is needed. The services of DES Farm Management are utilized by more or less half of the farmers visiting KGKs. The Horticulture and Soil Science are more or less on the same footing in so far as the utilization of their services by farmers was concerned. The services of DES Agricultural Engineering and Home Science were least utilized. Of the DESs Veterinary Sciences and Animal Sciences, the services of the former were better utilized. It was probably so because of the disease problems encountered by respondents in their animals.

**5.4.1.1 Perception About the Utility of Visit and Information Obtained from DESs:** The study indicated that a sizable number of respondents found their visits highly beneficial (46.00%) and half of them as beneficial. There were only four respondents who reported their visit to KGKs to be not so beneficial. It is a good revelation of the study that a significant number of

farmers visiting KGKs observed their visit to be beneficial. However, it was essential to determine the factors which led to perceive some farmers that their visit did not prove to be beneficial.

On further probing, it was established that all the respondents did get the required information to their satisfaction. As to how did they get the required information was also found out. To be specific, it was reported to be (i) through proper guidance (40.00%), (ii) through 'Krishi Pramarsh Patra' (26.00%), (iii) through reply of problems (24.00%), (iv) to get new seeds for demonstration (20.00%), and (v) through trainings (10.00%).

**5.4.5 Farmers Contact with DESs in Village:** A significant majority of the respondents (84.00%) replied in affirmative on asking if any of the DESs ever visited their village. It was further asked if they contacted the DESs of their own as and when they visited their village. More than three-fourth of them (76.00%) came out with a positive response.

**5.4.6 Extension Activities Organized in Villages:** The respondents were asked if the KGKs ever organized any of the extension activities in their or a nearby village. Eighty four per cent of them confirmed having organized extension activities in their villages by their respective KGKs.

The account of activities organized by KGKs in the respondents' villages is contained in Table 5.26.

The Table 5.26 indicates that farmers account of extension activities organized in their villages constituted

Table 5.26. Farmers Account of Extension Activities Organized in their Villages by KGKs

| Sl.No. | Extension Activity | Frequency (N=100) | Percentage |
|---|---|---|---|
| 1. | Group meetings | 56 | 56.00 |
| 2. | Field Days | 56 | 56.00 |
| 3. | Trainings | 44 | 44.00 |
| 4. | Demonstrations | 42 | 42.00 |
| 5. | Campaigns | 18 | 18.00 |
| 6. | Trials | 6 | 6.00 |
| 7. | Mini Kisan Mela | 2 | 2.00 |

field days and group meetings 56.00 per cent each, trainings (44.00%), demonstrations (42.00%), campaigns (18.00%), trials (6.00%) and Mini Kisan Mela (2.00%).

It was further found that 68.00 per cent of them did participate in the extension activities (Table 5.26) when these were organized in their villages.

**5.4.7 Often Utilized Sources of Information:** The respondents were asked the often utilized sources of information for crop production. The formal sources of information were reported to be ADOs (80.00%) and DESs (70.00%). The informal sources of information progressive farmers (64.00%), dealers (32.00%), neighbours (20.00%) and relatives (2.00%).

**5.4.8 Visit to University Campus:** Almost half of the respondents have visited university campus at Hisar on the occasion of Kisan Mela (56.00%), and Farm Darshan (50.00%).

However, some of the respondents (10.00%) have visited the HAU campus at Hisar for participation in a training.

**5.4.9 Membership of 'Haryana Kheti':** The study indicated that a sizable number of respondents (46.00%) had subscribed for 'Haryana Kheti' at one stage or the other on yearly membership basis.

In so far as the level of utility of 'Haryana Kheti' for getting information related to crop and livestock production was concerned, 56.52 per cent of the respondents reported it to be informative. Those who found it highly informative were 21.74 per cent only and an equal number of them perceived it to be 'somewhat' informative only.

There were only 26.08 per cent respondents who had sought solutions of their problems through 'Pathak Parsonoutri' column in 'Haryana Kheti'.

**5.4.10 Farmers' Perception of Help Available from KGKs:** The observations made on farmers' perception of help available to them from KGKs are contained in Table 5.27.

**5.4.10.1 Crop Production:** The Table 5.27 reveals that the help available to majority of the farmers for crop production was found to be guidance on efficient and balanced use of fertilizer (84.00%), integrated pest-management (84.00%), about suitable varieties of the area (82.00%), timely use of weedicides (76.00%), sowing time of different crops (74.00%) and guidance on methods for sowing different crops (64.00%).

Table 5.27. Farmers' Perception of Help Available from KGKs

| Sl.No. | Type of help | Frequency (N=100) | Percentage |
|---|---|---|---|
| | A. Crop Production | | |
| 1. | Guidance on efficient and balanced use of fertilizer | 84 | 84.00 |
| 2. | Guidance on intetrated pest-management | 84 | 84.00 |
| 3. | Through proper guidance about suitable varieties of the area | 82 | 82.00 |
| 4. | Guidance on timely use of weedicides | 76 | 76.00 |
| 5. | Guidance on sowing time of different crops | 74 | 74.00 |
| 6. | Guidance on methods for sowing different crops | 64 | 64.00 |
| 7. | Guidance on seed treatment of different crop seeds | 42 | 42.00 |
| 8. | Guidance on post-harvest technology | 32 | 32.00 |
| | B. Livestock Production | | |
| 1. | Guidance for improving the quality of animals | 32 | 32.00 |
| 2. | Guidance for upkeep of milch animals | 27 | 27.00 |
| 3. | Guidance on preventive measures against animal diseases | 22 | 22.00 |
| 4. | Guidance on poultry farming | 10 | 10.00 |

A sizable number of respondents also mentioned guidance on seed treatment of different crop seeds (42.00%) and post-harvest technology (32.00%).

**5.4.10.2 Livestock Production:** The help perceived to be available to farmers for livestock production included guidance for improving the quality of animals (32.00%), upkeep of milch animals (27.00%), preventive measures against animal diseases (22.00%) besides poultry farming (10.00%).

It is quite interesting to note that majority of the farmers who have been visiting KGKs did perceive and acknowledged appreciable help on various aspects related to crop and livestock production as well as poultry farming from the KGKs. However, a more detailed probe might be needed for working out returns at farmers field in economic terms. To be specific, how much benefit accures to farmers seeking help from KGKs to meet their needs of technical help and guidance in terms of per unit increase in production or increased income at their farms.

**5.4.11 Problems Perceived by Farmers in Availing the Services of KGKs:** The data were collected about the problems perceived by farmers in availing the services of KGKs (Table 5.28).

Forty per cent of the respondents reported that no direct help in the form of inputs, implements, planting material, etc., was available from KGKs. The other problems pointed out included non-availability of DESs at the time of visit to KGKs leading to wastage of time and money (30.00%), difficulty in paying repeated visits to KGKs which on occasions were necessary for want of time and sufficient money to meet the cost of travel (25.00%), information provided was more of theoretical nature (18.00%), visit proved futile when the

Table 5.28. Problems Perceived by Farmers in Availing the Services of KGKs

| Sl.No. | Problems | Frequency (N=100) | Percentage |
|---|---|---|---|
| 1. | No direct help in the form of inputs, implements, planting material, etc. | 40 | 40.00 |
| 2. | Non-availability of DESs at the time of visit to KGKs leading to wastage of time and money | 30 | 30.00 |
| 3. | Difficulty in paying repeated visits to KGKs which on occasions were necessary for want of time and sufficient money to meet the cost of travel | 25 | 25.00 |
| 4. | Information provided more of theoretical nature | 18 | 18.00 |
| 5. | Visit proves futile when the guidance available was difficult to apply in practice for economic and other reasons | 12 | 12.00 |
| 6. | Lack of facilities for stay at KGKs when return journey not possible on the same day | 5 | 5.00 |

guidance available was difficult to apply in practice for economic and other reasons (12.00%) and lack of facilities for stay at KGKs when return journey was not possible on the same day (5.00%).

An examination of the problems perceived by respondents will indicate that farmers who visited KGKs expected the provision for some inputs, implements or planting material from the KGKs. In a way such expectations have developed over a period of time possibly because of the reasons that many of the

extension activities carried out in rural areas under the auspices of Community Development (CD) and National Extension Service (NES) were supported with inputs or subsidies. Possibly for the same reason some respondents (18.00%) perceived that the information provided atKGKs was more of theoretical nature. The communication must promote understanding through effective and free feedback so as to remove all barriers between the farmers and specialists (Dahama and Bhatnagar, 1987).

The perceived constraints of the farmers might be overcome by providing proper orientation about the services and facilities being made available to farmers at KGKs. This can best be done on the occasion of Kisan Mela, Farm Darshan and training programmes organized on and off the university campus. Proper feedback maintains the stability and equilibrium of a communication system (Power et al., 1960).

**5.4.12 Facilities Required at KGKs:** The respondents were asked about the facilities which in their opinion needed to be provided at KGKs. The viewpoint of farmers about the facilities is presented in Table 5.29.

A significant majority of the farmers demanded required quantity of seeds for demonstration plots (84.00%), provision for refresher course for crop production on scientific lines (80.00%) and provision for implements required for crop production at sowing time (72.00%).

Other facilities demanded by farmers included the supply of 'Krishi Pramarsh Patra' to village panchayats all over the

Table 5.29. Facilities Required at KGKs

| Sl.No. | Facilities Required | Frequency (N=100) | Percentage |
|---|---|---|---|
| 1. | Required quantity of seeds for demonstration plots | 84 | 84.00 |
| 2. | Provision for refresher course for crop production on scientific lines | 80 | 80.00 |
| 3. | Provision for implements needed for crop production at sowing time | 72 | 72.00 |
| 4. | Supply of 'Krishi Pramarsh Patra' to village panchayats all over the State | 48 | 48.00 |
| 5. | Provision for HYVs seeds, fertilizers, insecticides, weedicides, etc., on subsidized rates | 36 | 36.00 |
| 6. | Provision for stay arrangements at KGKs | 5 | 5.00 |

State (48.00%), supply of HYVs seeds, fertilizers, insecticides, weedicides, etc., on subsidized rates (36.00%), and provision for stay arrangements at KGKs (5.00%).

The demand of the farmers for more seeds for laying demonstrations needs to be met as demonstrations constitute an integral part of extension programme. It would be in the interest of promoting scientific farming if the demonstration plots are laid even in villages other than the ones' adopted by KGKs. Provision for refresher course on scientific farming before the 'Rabi' and 'Kharif' crop seasons for the interested farmers is again in the interest of scientific farming. The

KGKs should come out with such courses every year. In initial stages, such training courses may be organized at selected KGKs in collaboration with the Department of Agriculture. The demand for the supply of 'Krishi Pramarsh Patra' to village panchayats all over the State is well justified. Rather, these should be mailed even to some selected farmers other than the progressive ones.

The demand for provision for HYVs seeds, fertilizer, insecticides, weedicides, etc., on subsidized rates and provision for stay arrangement at KGKs need to be examined in the light of the policy framework.

Overall nature of perception indicated that the services of KGKs were being utilized more or less by the same farmers. This calls for further promoting the demand for the services of KGKs among the farmers of the area. The study indicates that most of the farmers who visit KGKs for technical guidance do find the services useful for increasing their crop and livestock production. The university publications like 'Haryana Kheti' should be popularised among farmers by increasing the number of subscribers. The aforementioned steps will go a long way in strengthening the linkages between the farmers and the extension personnel of the university. Many farmers were keen to implement changes in their farming practices if they considered them to be worthwhile (Unwin, 1985). Obviously, better linkages in the technology transfer system would bring farmers closer to the scientist and provide them opportunities

latest advances in agriculture and livestock farming. The organization will have to operate in a social context of competing interests to resist to attempts of some elite groups to capture its services exclusively. The sociological and economic evaluation of the extension impact will have the task of ascertaining to what extent the extension project will have succeeded in its objective of effectively reaching the mass scale and marginal farmers. However, if the organizational developments and the actual performance of extension services in real life are any indication for the interest which sociologists are likely to take in doing field research and conceptualizing on extension then a new up surge of sociological interest in this field is predictable (Cernea, 1981).

## CHAPTER VI

## SUGGESTED MODIFICATIONS IN TECHNOLOGY TRANSFER MODEL

Based on the study entitled, "Technology Transfer Model - An Analysis of Linkages", it can be said without hesitation that there is need for modifying and revitalizing the technology transfer model of the HAU. The study has brought out that from infrastructural and organizational point of view the technology transfer model being operated by HAU is quite unique and time tested with significant achievements and contributions to the overall economic upliftment of the farming community of the State. Nevertheless, as mostly happens with large organizations, the operational aspect of the model seems to be ridden with functional problems at different levels which keep multiplying leading to new problems. In this process, the linkages get weakened which, in turn, adversely affect intervening linkages and the model as a whole both in short and long term perspectives. To revitalize and reinforce the technology transfer model, based on the findings of the study, there is need for pinpointing efforts on the following aspects:

6.1 Need for a coherent strategy for strengthening of the linkages at different levels so that there is efficient feedback on the problems with due support from the research and transfer of technology from subject-matter departments to the concerned clientele.

6.2 Building up of extension administration conducive to a really effective cooperation and collaboration between the Directorate of Extension Education and different colleges so that there is functional and effective interaction between the Director of Extension Education and subject-matter HODs, HODs and ULESs, ULESs and DESs and DESs and field functionaries of the Departments of Agriculture, Animal Husbandry and other allied Departments and institutions.

6.3 Need for strengthening on continued basis the infrastructural facilities to overcome the difficulties and problems brought out by the study and facilitate still better availability of advisory service to farmers.

6.4 Making 'Krishi Gyan Kendras' popular instituions by educating farmers about services and facilities being made available so that the farm advisory services get utilized by majority of the farmers.

To achieve the aforementioned, the suggestions which have emanated on the analysis and interpretation of the linkages are presented hereunder:

**6.1 Suggested Model**

6.1.1 The existing technology transfer model though has provisions for stronger linkages within the different operational units and varying levels yet the university entails not so strong linkages between DEE and HODs, HODs and ULESs, ULESs and DESs, DESs and DEE, DESs and their respective HODs, and ULESs and DEE. There is need for strengthening and reinforcing these linkages. To efficiently utilize the existing huge resources in the form of scientific manpower, infrastructure, physical facilities and ever increasing budgetary provision in the Directorate of Extension Education, systems approach needs to be followed. The linkages in the process of delineation of the problems related to crop and

livestock farming and home economics, identification of best available solutions to the problems in the form of improved practices, duly supported with research backing and extension methodology for bringing home to concerned clientele in the shortest possible time should be examined and revitalized on continued basis. Based on the results of the study, the suggested 'Model for Technology Transfer' is presented in Figure 6.1.

**6.1.2** The planners, policy makers and administrators have to bear in mind that Extension Education is a highly scientific discipline which is based on a sound body of philosophy, principles, contents, methods and large mass of knowledge which has been developed over a period of time as a result of researches in Extension Education and other allied sciences during the last four decades or so. Therefore, the practioners of extension as well as those responsible for extension administration at the State, district and village level need to have sufficient training in the discipline at least to the extent that it would enable them to carry out these functions efficiently and with full confidence based on competency in the subject-matter. Obviously, to achieve this, it would be in the interest of organization to appoint persons on extension positions with Extension Education qualifications.

The DESs, ULESs and HODs need to be given training in extension methodology. The training contents and the duration of training have to be different for these three categories of

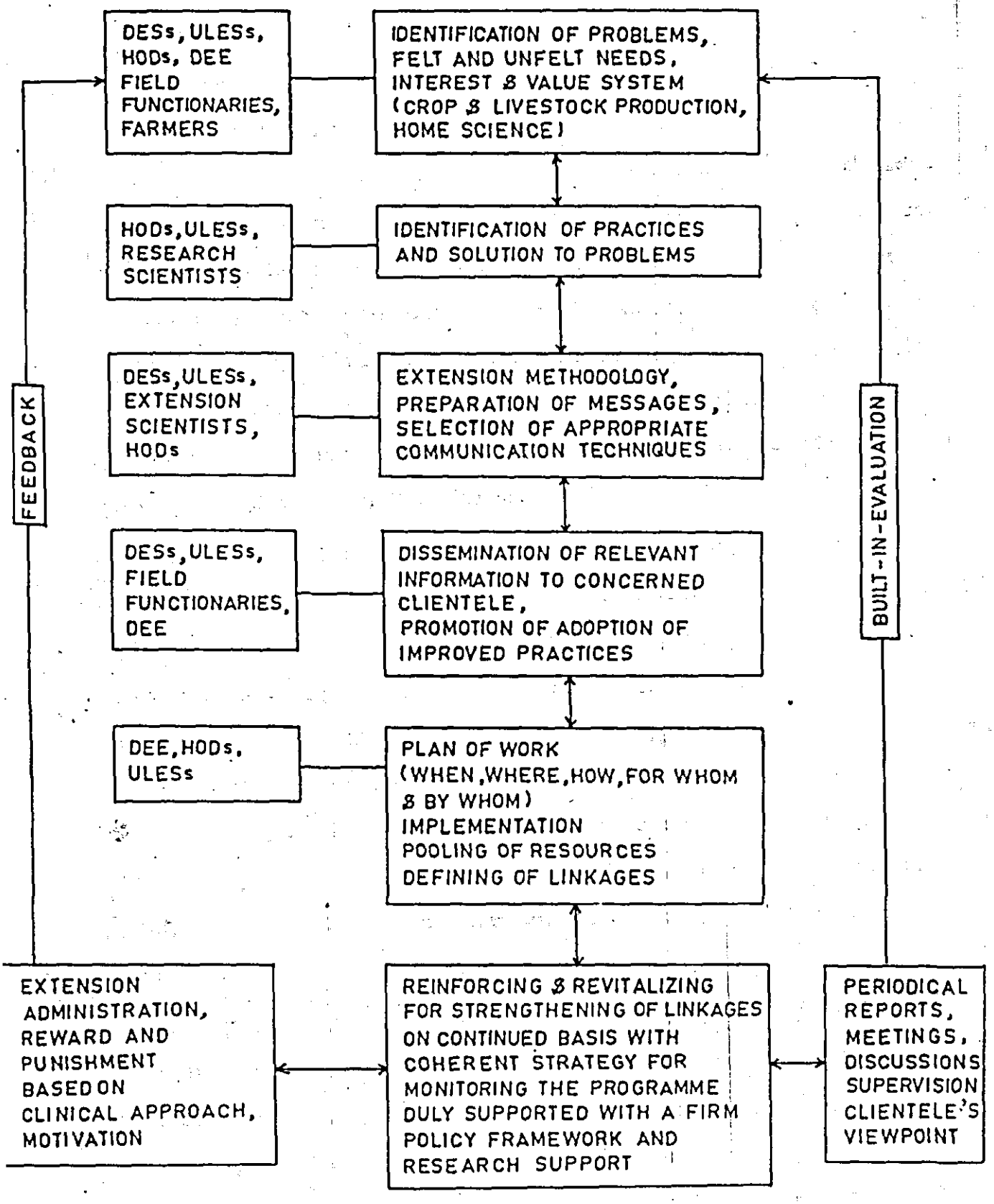



FIGURE 6·1 SUGGESTED MODEL FOR TRANSFER OF TECHNOLOGY

scientists. While DESs have to be trained more in the methodology of field extension jobs, ULESs and HODs have to be trained more in programme development and extension administration. No doubt, some of the contents for this training have to be common in nature. However, to achieve efficiency in the transfer of technology the rule of the thumb should be to so prescribe educational qualifications that their major subject constitutes the discipline for which they have been appointed and the minor subject in every case as far as academic standards permit should be Extension Education.

**6.1.3** To develop an efficient feedback system, one of the incumbents in the Directorate of Extension Education should be given an exclusive responsibility. Every DES should indicate in his monthly diary of work done, the problems which need feedback. The ULESs on receiving monthly diaries should pass on these problems to their respective HODs for further necessary action and providing feedback to the concerned quarters through the extension staff. To be specific, the feedback on the problems should be a continuous process which at the same time should be well monitored.

**6.1.4** The faculty members on extension side and, particularly, the DESs should be given an adequate training in extension methodology. They need to be quite clear about what and why of every extension activity. For instance, if they have to organize a training programme they should be clear about the training needs, collaborating departments, resources to be pooled, training contents, physical facilities required and

how to obtain cooperation and collaboration from the collaborating departments. The same should be true for the other extension activities.

**6.1.5** The newsletters issued by several of the ULESs every month should become an integral part of the extension activities of all the disciplines amenable to extension. To make it so, it must be obligatory for every subject-matter head of department to keep sending information of applicable value to DEE. This will facilitate regular issuance of the newsletters by the respective ULESs. The ULESs should also keeping consulting Indian and foreign journals to pick up useful research for the newsletters.

**6.1.6** There should be periodical meetings to make an assessment of the transferable technologies available in different departments and the extent to which these technologies have been actually transferred to the users and their adoption status. If possible, some farmers may also be invited to these meetings. Action plans should be developed for effectively transferring the technology to the concerned clientele. Existence of problems for which remedial measures exist should be taken as the priority areas of extension work.

**6.2 Building up of Extension Administration**

**6.2.1** The ULESs need to be seated either in the Departmet or in the Directorate of Extension Education. Though, their dual control may continue for the efficient implementation of extension activities of respective subject-matter departments,

it would be appropriate to make them sit in the Directorate of Extension Education. However, the ULESs must continue to be associated with the activities of the department, that is, teaching and research. The existing 'dual control' system seems to have led to a type of lassaize-fair approach during the course of time which has weakened the interaction at different operational levels. There is need for working out an efficient system for the administrative and technical control of extension staff.

**6.2.2** The organization of extension activities calls for a live contact with the farmers and the functionaries of the Department of Agriculture. On the one hand, the DESs should be ensured that well guided endeavours are needed to obtain maximum participation of the farmers as well as the local functionaries of the Department of Agriculture, Animal Husbandry and other concerned departments in all the extension activities organized by them. For an effective linkage, approach should be such that the participating farmers get a sincere feeling of being quite important for that function and that the activities were exclusively organized to enrich them with the latest knowledge related to the problem being encountered by them during that period and train them with the needed skills. This is necessary for judicious utilization of the resources available with them. In all the extension programmes in which the participation of the farmers is obtained, it should be put in their mind that it is with the

utilization of scientific knowledge and pertinent technology that the increase in the yield per unit of land or per unit of livestock and poultry would be possible.

**6.2.3** There is need for raising a special team of extension personnel to man the extension jobs at different levels. This may be achieved by working out a 'Master Plan' for the purpose. They have to be so trained and brought up that they not only have interest and dedication for extension work but also act as a friend, philosopher and guide in the real sense of the words for their clientele.

**6.2.4** The existing state of frustration among faculty members working on extension job is a matter of serious consideration. There is need to bring to surface the causes responsible for this besides providing appropriate incentives to really deserving cases.

**6.2.5** No faculty member should be transferred on extension jobs against his wishes. Likewise, no faculty member should be transferred on an extension position on a complaint.

**6.2.6** The DESs should tour on fixed days only. This is necessary to facilitate their availability at KGKs on certain specified days in a week. Though, such a provision has long been existing yet it needs to be adhered to.

**6.2.7** The DESs must tour at least for a week in a month and budget for this purpose need to be provided accordingly. Every DES must write his tour diary which should point out the

concrete outcome of the tour taken by him. Appropriate follow up action should be taken to promote confidence of farmers in innovations.

**6.2.8** Every HOD should submit a research note containing latest findings related to the subject-matter of his department to DEE every month. The DEE, in turn, may take appropriate action for transfer of the information of applicable value to the concerned clientele through the ULESs of respective disciplines.

**6.2.9** It should be made obligatory for every department amenable to extension education to thoroughly take a stock of the extension education activities of his department before and after 'Rabi' and 'Kharif' seasons. The discipline-wise extension education programmes so developed should then be discussed college-wise at a joint meeting of HODs, ULESs, DESs with DEE in chair. Subsequently, a calender of extension activities may be prepared month-wise for every district and the execution of these activities should be exclusive responsibility of DEE with due technical support from the heads of subject-matter departments.

**6.2.10** The ULESs must participate in maximum possible number of activities organized in the field. In no case, they should participate in less than 30 to 40 per cent of the activities organized in the field. It is necessary to develop an efficient 'inspection and visit system'.

**6.2.11** There is need for streamlining the process of circulating the recommendations contained in package of practices for quick percolation of information to the ADOs, CAOs and others working at the grass-root level so that the requisite information further gets percolated to the farmers in their respective areas.

**6.2.12** The ADOs need to be provided proper space for housing their office at their specified headquarters.

**6.2.13** The ADOs and other field funcionaries after their placement should be given orientation about their specific duties and that how they should carry out specific jobs and when, whom and how they should report the crop production problems.

**6.2.14** An in-built mechanism should be developed for field functionaries to enable them to keep live contact with specialists at KGKs so that they may utilize their services for promotion of crop production programmes. Nevertheless, the senior officers in the department on their supervisory visits should also discuss about their problems as well as about the latest advances in crop production sciences.

**6.3 Strengthening of Infrastructural Facilities**

**6.3.1** Every KGK should be equipped with important audio-visual aids like VCR, T.V., Movie Projector, Overhead Projector, Slide Projector, Tape Recorder, etc. A projectionist should also be provided for proper maintenance and use of the audio-visual aids. Facilities for preparation of posters, charts, leaflets, hand bills, etc., should also be created at the KGKs.

6.3.2 A sale booth should be provided at every KGK for HYVs seeds of important cereals and fodder, fertilizers, insecticides, weedicides, fungicides, veterinary medicines, etc. Likewise, planting material for vegetable and horticultural crops should also be provided.

6.3.3 Facilities for A.I. of cows and buffaloes should be provided at KGKs.

6.3.4 Demonstration units for dairy, poultry, beehive, etc., should be set up at KGKs for education of farmers' visiting KGKs.

**6.4 Making Krishi Gyan Kendras Popular**

6.4.1 The success stories of the work done in villages adopted by KGKs should be widely publicised to facilitate the spread of useful information among farmers of the area.

6.4.2 The team of DESs should select the villages for adoption for a period of one year only and the selection of the villages should be done on priority basis keeping in view the intensity of crop production and other developmental problems so that the extension work carried out in the selected villages should lead to the establishment of linkages on continued basis, that is, after the efforts are withdrawn by the extension team, the farmers on their own initiative, keep contacting the specialists at the 'Krishi Gyan Kendras'.

6.4.3 To establish increasing interaction with the farmers, provision for 2 to 3 days training programme should be made for farmers. Such a training programme may be organized every month

at KGks in collaboration with the functionaries of agriculture department. The ADOs, CAOs, SMSs, etc., can be contacted area-wise in their fortnightly meetings for obtaining their cooperation for sending farmers for the training.

**6.4.4** More of practical information be provided to farmer when they need information.

**6.4.5** Question-answer sessions should be held for farmers at KGKs on fixed dates every month in which all the subject-matter specialists should also be present.

**6.4.6** The study seems to suggest that the same very farmers have been visiting KGKs. In other words, the services of the farmers were being utilized by more or less the same farmers. Some specific programmes or extension activities like campaigns or field days should be organized exclusively to promote the contact of more and more farmers with the specialists so that their services get utilized by a maximm number of farmers in the area.

**6.4.7** To ensure percolation of information at the grass-root level, at least 5 to 10 selected farmers in every village all over the State must be supplied the copies of newsletters. There can be different categories of farmers for different types of newsletters.

**6.4.8** A perusal of the purpose with which the farmers have been visiting KGKs was either to get inputs or to get information about the crop or livestock farming and problems

related to these. The farmers visiting KGKs, at present, are not in larger numer. But this number may increase with the increase of popularity of KGKs. Therefore, to meet the farmers needs of information and knowledge, topic-wise handouts may be got prepared on different aspects of crop and livestock production and home science for free distribution to them at KGKs and on other occasions like trainings, group discussions and meetings.

# CHAPTER VII

## SUMMARY AND IMPLICATIONS

During the post-independence period several technology transfer models have been tried and there has been tremendous improvement in overall production of agriculture, livestock, poultry, etc. Of the several technology transfer models taken up by different organizations, institutions and government agencies, the HAU technology transfer model has been considered as unique.

This model has been in operation ever since the university came into being (February 2, 1970). Having been in operation for more than two decades, though it might not appear to be necessary, yet it would be in the interest of the organization to have a critical appraisal of the model to facilitate pruning where necessary and infrastructural modifications in the form of manpower and other resources to upkeep the efficiency of the organization for quick transfer of technology from the university to the concerned clientele and required feedback to pursue problem-oriented research and extension work on continued basis. With this background, this study is proposed to be taken up with the specific objectives given hereunder:

1. To study the university technology transfer model in historical perspective.

2. To critically examine the interdepartmental linkages essential for reinforcing and revitalizing the technology transfer model.

3. To determine the adequacy of linkages within and outside the university for efficient feedback.

4. To make an assessment of farmers' perception of the technology transfer system of the university.

5. To suggest modifications in the existing extension model for quick transfer of technology.

**7.2 Theoretical Orientation**

The Chapter II contains the theoretical orientation highlighting the conceptual framework of the research problem.

**7.3 Methodology**

The study was conducted in Haryana State. HAU technology transfer model was taken up for the analysis of linkages. The methodological steps followed were as follows:

For the study of the university technology transfer model in its historical perspective the relevant information and required data were collected from the annual reports of the period, records and other reports available in the Directorate of Extension Education of the university, publications brought out during the period besides verbal communication with some experienced faculty members who could serve as resource persons.

For the study of the interdepartmental linkages and adequacy of linkages within and outside the university, the data were collected from the 18 HODs amenable to extension

education, 12 ULESs, 84 DESs besides 100 field functionaries comprising SMSs, CAOs and ADOs.

For making an assessment of farmers' perception of technology transfer model of the university, the data were collected with the help of an interview schedule from 100 farmers drawn from all over the State.

**7.4 Findings**

Some of the major findings were as follows:

**7.4.1 Technology Transfer Model in Historical Perspectives**

The PAU Act 1961 included undertaking the extension of agricultural and other allied sciences to the rural people of the State as one of the objectives of the university. Based on the recommendations of Nalagarh Committee the scheme on the farm advisory service was started during the year 1961-62 with a provision for SMSs in four subjects, namely, Agronomy, Horticulture, Plant Protection and Soil Science at the headquarters of most of the districts. Under this programme, trainings were organized for inservice staff and farmers besides setting up a chain of demonstrations all over the State. The extension training and advisory activities of the university aroused great interest among the farming community.

The Extension Wing at Hisar started functioning during the year 1964-65. In spite of inadequate staff, it made a good start by organizing a number of extension activities in the field besides imparting undergraudate instructions and undertaking post-graduate study programme. A new dimension was added

to the Extension Department during the year 1966-67 in the form of Junior Staff School for strengthening the training activities for farmers and field functionaies of government department. Even before the HAU came into being, the Hisar campus of the university became a source of inspiration to great majority of farmers and others connected with the development of agriculture and animal husbandry.

After the HAU came into being, farm advisory service centres (KGKs) were set up at all the district headquarters. The period under the stewardship of the then Vice-Chancellor A.L. Fletcher and Dr. J.C. Sharma as ADEE experienced tremendous developments in the extension education set up of the university. The ULESs were provided for 12 disciplines and a team of DESs in the corresponding disciplines (with the exception of poultry) was provided at the KGKs. The basic idea was to provide advisory services to the farmers under one roof. For their efficient performance and to define their roles, job chart was prepared both for ULESs and DESs. The progamme of work for implementation in the field was jointly prepared by the ULESs and DESs under the guidance of the respective subject-matter HODs and DEE.

According to Annual Report for the year 1990-91, a big step up activity of the KGK was the conversion of 12 KGKs into 16 KVKs under the financial arrangement of ICAR. The KVKs have already been set up at Faridabad, Jind, Kaithal, Kurukshetra, Sonipat and Yamuna Nagar in addition to Sadalpur (Hisar) where one already existed.

### 7.4.2 Interdepartmental Linkages Essential for Reinforcing and Revitalizing the Technology Transfer Model

#### 7.4.2.1 Subject-Matter Heads of Departments

A significant majority of HODs (83.33%) had not obtained training in extension education. While most of the HODs conceptualized the importance of extension education as a discipline yet there seemed to be a need for developing correct concept of the discipline among them through proper orientation. The study established that almost every department had some research based recommendations for dissemination to the clientele concerned.

Some of the important factors which impeded the forwardal of research findings to extension agencies were found to be non-availability of funds for large scale production of HYVs seeds, lack of rapport between department and extension agency, lack of faculty members having interest for extension jobs, etc.

The HODs kept their ULESs and DESs abreast of latest research advances in their respective disciplines by organizing refresher trainings, meetings, group discussions, participation in seminars, workshops, etc.

A significant majority of HODs (88.89%) were in favour of involving faculty members on extension side in teaching and/or research work. More than half of the HODs (55.56%), wanted complete control of the extension faculty members with the department (Table 5.1). Nearly two-fifth of HODs (38.89%) opted for the existing seating arrangements, that is, forenoon in the

department and Directorate of Extension Education in the afternoon.

Two-third of HODs (66.67%) claimed that activities of their department were carried out in collaboration with other departments.

The functional constraints encountered by HODs in promoting extension education activities included shortage of budget, problem of mobility for want of a vehicle, lack of audio-visual aids, etc., (Table 5.4).

**7.4.2.2 University-Level Extension Specialists**

The study indicated that total experience of ULESs ranged from 13 to 32 years. With the exception of one ULES, all of them were in professors rank. Half of them felt satisfied on the job of ULES.

Most of the ULESs toured for 5 to 8 days in a month for supervising the work of DESs and visited 6 to 8 villages.

The study indicated that most of the ULESs (8) obtained feedback from their respective DESs and in consultation with their HODs chalked out the annual programme of work.

It was found that none of the ULESs reported lack of collaboration or problems encountered in obtaining collaboration from any of the departments.

All the ULESs indicated that one-third of time was devoted by them to the teaching of courses and guidance of post-graduate students in their respective departments. Of the 12 ULESs, only four of them reported their involvement in research work.

The study indicated that of the 12 ULESs, 10 of them had published research papers.

It was found that nine of the ULESs were bringing out monthly or quarterly newsletters in their subject-matter areas.

The study showed that ULESs kept themselves abreast of latest advances in their respective subject-matter areas through the study of relevant literature consulting research journals, dailies, participation in seminars, conferences, etc. The ULESs got professional support from their department through discussion with their respective HODs, seminars organized in the department, etc.

The ULESs showed interest in obtaining advance training in institutions both within and outside the country.

The results suggested that most of the ULESs had intimated several field problems to their respective HODs for research and finding solutions for feedback to farmers (Table 5.7).

The findings suggested that there was increase in the adoption of new technology on continued basis at the level of farmers. Nevertheless, the assessment indicated qualitative improvements in extension education activities organized in the field.

The problems encountered by ULESs in their day to day work were reported to be difficulty in undertaking required touring for want of a vehicle, shortage of funds for TA and DA, lack of audio-visual aids, etc., (Table 5.8).

More than half of the ULESs asked for transportation facilities (9), provision for more funds for contingency, TA and POL, better audio-visual aids (6), etc.

**7.4.2.3 District Extension Specialists**

The study indicated that 51.19 per cent of DESs were transferred from teaching and research on their present positions and 65.48 per cent of them wanted to continue on their present job.

The study indicated that only 28 DESs had experience in teaching and 49 had research experience.

It was found that 51.19 per cent of the DESs possessed Master's degree in their respective discipline. The remaining 48.81 per cent were found to have Doctorate degree.

Of the 84 DESs, 69.05 per cent of them had obtained one or the other training of varying duration in their respective subject-matter areas either at HAU or outside HAU. On further probing, 67.86 per cent of them showed interest in obtaining training in extension methodology.

The monthly programme of work was reported to be prepared keeping in view the needs of the area and resources at their disposal for carrying out the extension activities.

Majority of the DESs (48.81%) reported that their respective ULESs supervised their work every month. A sizable number of DESs (38.10%) reported half yearly supervision by their respective HODs. In so far as supervision by DEE was concerned, more than half of them (57.14%) pointed out supervision after every quarter.

Of the 84 DESs, 77.38 per cent of them had not associated themselves in a research project or laid down adaptive research trials.

The study indicated that the DESs intimated a number of farming problems to their seniors (ULESs, HODs, DEE or the concerned scientists) for further investigation and finding solution (Table 5.11).

The ways for keeping themselves abreast of the latest advances in their discipline used by DESs were reported to be study of journals, reports and literature, participation in meetings, seminars, conferences, etc.

The library facilities at KGKs were reported to be not adequate.

A majority of the DESs (67.86%) felt that they needed training in extension methodology.

The difficulties encountered by a large number of DESs included lack of budget (80.59%), lack of transportation facilities (64.29%), lack of audio-visual aids (60.71%), etc., (Table 5.12).

More than half of the DESs asked for provision for more funds for TA and POL (80.95%), transportation facilities (61.90%), audio-visual aids (59.92%), incentives for extension staff (54.76%), etc.

A significant majority of DESs (90.48%) were for the grant of incentive.

### 7.4.3 Adequacy of Linkages Within and Outside the University for Efficient Feedback

#### 7.4.3.1 Adequacy of Linkages Within the University

The study indicated that HODs did participate in extension activities, namely, method demonstrations (72.22%), result demonstrations (55.56%), training organized in villages (55.56%), or at farmers' field (61.11%), etc.

The study revealed that the HODs devoted only 5 to 10 per cent of their time to extension work which included radio and TV talks, lectures in training programmes, etc.

The extent of help available to HODs from the Directorate of Extension Education was reported to be satisfactory by 66.67 per cent of them.

The HODs pointed out a number of weaknesses in implementing extension education programme of their respective discipline which included lack of budget, lack of advanced training facilities for field staff, unwilling extension worker, lack of audio-visual aids, failure to prepare actual farm plan, inadequate coordination with government field functionaries, etc.

The HODs based on their extension experience suggested several measures which needed to be promptly followed for strengthening the linkages. Some of these included more budgetary provision for extension work, more training facilities for farmers, strengthening of linkages between research and extension staff, audio-visual aid facilities, etc.

The shortcomings observed by ULESs on their visits to KGKs were lack of maintenance of records, lack of transport and other facilities, lack of funds for laying out demonstrations, etc.

The steps taken by ULESs in overcoming the shortcomings were that DESs were impressed upon for maintaining proper record of the work done by them, administrative action where needed, proper maintenance of daily diary, supply of inputs, etc.

The methods being used by ULESs for popularising the latest research finding among farmers were demonstrations, training camps, leaflets and handouts, radio talks, etc.

It was found that all the ULESs were approached by farmers through letters for seeking advice on farming problems.

The study indicated that the help rendered by Training Unit was organization of some training programmes, and publication of leaflets, handouts, etc., by the Farm Information and Communication Unit of the Directorate.

A majority of DESs (78.57%) spent 6 to 10 days on tour in a month.

More than three-fifth of DESs claimed that on an average 40 farmers contacted them at KGKs in a month.

The steps taken or methods adopted by DESs to bring home feedback on their problems to farmers included discussion of the problems with farmers, demonstration on relevant topics, home and field visits, etc.

For making KGK popular DESs suggested provision for sale counters for important inputs (80.95%) at KGKs, facilities for training of farmers (45.24%), a waiting room and stay facilities for farmers at KGKs (19.05%), etc., (Table 5.19).

**7.4.3.2 Adequacy of Linkages Outside the University**

The field functionaries acknowledged both direct and indirect help from HAU for their professional enrichment. The perception of direct help included training programmes, AOWs for Rabi and Kharif seasons, etc. The indirect help from HAU was reported to be through supply of leaflets on important topics related to crop and livestock production, through popular articles published in Haryana Kheti/Haryana Farming, etc.

It was observed that more than half (53.00%) of the field functionaries maintained contacts with the university at their individual level.

The study revealed that the important information given to the senior officers of the Department of Agriculture before Rabi and Kharif seasons in the AOWs were passed on to the field functionaries at the grass-root level through fortnightly trainings.

The expectations of the field functionaries from the university included supply of package of practices in the form of tips (95.00%), supply of HYVs seeds (92.00%), laying out of demonstrations in maximum number of villages (90.00%), etc.

The problems which were being encountered by majority of the field functionaries included problem of mobility (94.00%),

non-availability of audio-visual aids (92.00%), lack of recognition for the hard work done (70.00%), etc., (Table 5.20).

A significant majority of the field functionaries pointed out non-availability of HYV seeds (82.00%), problem of weed management (80.00%), irrigation and water management (76.00%), etc.

### 7.4.4 Farmers' Perception of the Technology Transfer System of the University

A majority of the farmers who have been visiting KGKs were observed to be in low to medium age group (78.00%), possessed medium to high education (76.00%), low to medium land holdings (80.00%), resorted to self farming (86.00%), with a membership status of one or more organization (60.00%).

The study indicated that more than three-fourth of the farmers (78.00%) did visit KGKs at least once or more than that in a period of two months. More than half of the farmers (56.00%) visited KGKs to get information on the latest technology for crop or livestock production (Table 5.24).

The utilization of different DESs stationed at KGKs by farmers in descending order was found to be Plant Pathology (78.00%), Agronomy (72.00%), Entomology (68.00%), Vegetable Crops (56.00%), Farm Management (52.00%), Horticulture (42.00%), Soil Science (40.00%), Agricultural Engineering (14.00%), Animal Sciences (26.00%), Veterinary Sciences (48.00%) and Home Science (6.00%).

The study indicated that a sizable number of respondents found their visits highly beneficial (46.00%) and half of them as beneficial.

A significant majority of the farmers (84.00%) indicated that DESs visited their villages and more than three-fourth of them (76.00%) contacted the DESs of their own as and when they visited their villages.

A significant majority of the farmers (84.00%) confirmed having organized extension activities in their villages by their respective KGKs.

The study indicated that the formal ssources of information were reported to be ADOs (80.00%) and DESs (70.00%). The informal sources of information progressive farmers (64.00%), dealers (32.00%), neighbours (20.00%) and relatives (2.00%).

The study indicated that almost half of the farmers had visited university campus at Hisar on the occasion of Kisan Mela and Farm Darshan.

The study indicated that a sizable number of respondents (46.00%) had subscribed for 'Haryana Kheti' at one stage or the other on yearly membership basis. There were only 26.08 per cent respondents who had sought solutions of their problems through 'Pathak Parsonouttri' column in 'Haryana Kheti'.

The study indicated that majority of the farmers who have been visiting KGKs did perceive and acknowledged appreciable help on various aspects related to crop and livestock production as well as poultry farming from the KGKs (Table 5.27).

The farmers who visited KGKs expected the provision to them of some inputs, implements or planting material (Table 5.28).

The study indicated that a significant majority of the farmers demanded required quantity of seeds for demonstration plots (84.00%), provision for refresher course for crop production on scientific lines (80.00%), provision for implements required for crop production at sowing time (72.00%), etc., (Table 5.29).

### 7.4.5 Suggested Modifications in Technology Transfer Model

Based on the findings of the study some suggestions have been given to make improvements in the existing HAU model of technolgoy transfer. The need for a coherent strategy for implementing the extension activities in the field and for efficient feedback for resolving the farmers problems, building up of an effective extension administration, provision for adequate infrastructural facilities and making KGKs a popular institution for farm advisory service constituted priority areas for improving over the existing situation.

## IMPLICATIONS

Based on the findings of the study, some important implications have emerged which might help in providing some insight into the intricacies involved in the transfer of technology and bringing about necessary improvements in the technology transfer system. In this connection, the following issues need attention:

1. The existing organizational set up does not provide adequate input of extension education in the process of technology transfer. With the exception of Joint Director (Extension) all the senior positions (Director of Extension Education, Associate Director Farm Advisory Service, Associate Director Training) have been occupied by scientists from disciplines other than Extension Education. Some other positions like that of Audio-Visual Specialist and Exhibition Officer are also being manned by individuals who have no training in Extension Education. Obviously, this will have retrograte effect in the transfer of technology.

2. Majority of the HODs, ULESs and DESs have shown interest in training in extension methodology. It implies that they do feel the necessity of this training. The sooner this training is organized, the better it would be. In tune with their interest in training in extension methodology, such a training should become a regular feature and integral part of the policy framework.

3. The expansion in extension positions coupled with sufficient increase in budget provisions for the Directorate of Extension Education and at the same time obervations of HODs, ULESs and DESs about the shortage of budget for POL, TA and DA, demonstrations, etc., implies lack of mutual discussion on budgetary provisions. Rather than asking for more budget the issues should be clear in realistic terms so that uncalled for demands can be avoided.

4. Different concept of Extension Education by different subject-matter HODs implies the lack of correct concept of Extension Education. Obviously, this calls for measures directed to develop correct concept of Extension Education among all concerned.

5. None of the HODs having opted for complete control of extension staff with the DEE implies a weak link between the Directorate of Extension Education and the subject-matter departments. There should be a firm policy for strengthening these linkages (Table 5.1).

6. The lack of audio-visual aids and lack of interaction between research and extension staff as pointed out by HODs (Table 5.4) on the one hand will bring down the quality of extension activities and on the other hand will weaken the timely feedback of farming problems.

7. The study has indicated that annual programme of work was being prepared in each of the discipline for undertaking extension activities in the field. But it further indicated different ways of preparing the annual programme of work. It implies lack of standardized procedures for the purpose and in case these already existed were not being practised. It calls for reinforcing the standardized procedures for preparation of the annual programme of work.

8. The utilization of one-third time by ULESs as a matter of routine in teaching or research and some other activities is in tune with the prescribed norms. But keeping in view the

increasing needs of technology transfer, the norms of utilizing one-third time for teaching and research should not be considered as obligatory. For the reason that the farmers have now become comparatively more receptive to the technology and seek for newer information with interest, the ULESs as well as DESs should work towards refining and modification of technology transfer techniques.

9. A large number of problems have been pointed out by ULESs and DESs to their seniors (Table 5.7 and 5.11). In the absence of proper feedback and follow up action this exercise may not be of much use. Obviously, it implies creation of a cell in the Directorate of Extension Education to monitor follow up action in such cases and similar other cases. Wherever feasible and considered appropriate, quantitative and qualitative assessment of the work done should be made.

10. A number of working facilities have been demanded by ULESs (Table 5.9). An examination of the facilities seems to imply that their working conditions need improvement in several ways. On the one hand, they need to be given some working facilities to promote their efficiency in their day-to-day work, on the other hand they should be given adequate administrative powers to have control over their respective DESs so that the later do listen to them and act on their instructions.

11. The percentage of DESs with research experience was found to be higher as compared to those with teaching experience (Table 5.10). It shows that the faculty members on teaching

side had lesser occasions for transfer to extension. In view of this, there is need for creating a balance when effecting transfers so that proportionate number of faculty members get transferred from teaching and research to extension so as to strike a reasonable balance of experience.

12. The inadequate library facilities at KGKs implies lack of due attention to this important aspect. To keep DESs well informed, theyshould have access to recent literature.

13. The limiting of undertaking of extension activities to merely three villages as at present implies repeated contacts with more or less the same clientele. In case the policy of limiting the work to three villages at a time is to be retained, the villages need to be changed after a reasonable period.

14. A sizable number of HODs have pointed out inadequate interaction between extension and research staff as well as inadequate coordination of the extension staff with government field functionaries (Table 5.16). It seems to imply either the lack of initiative on the part of the concerned extension faculty members to interact with research scientists or vice-versa. Possibly, this may be better achieved if a definite policy framework with due approval of Extension Education Advisory Committee. Likewise, all the problems related to interaction between the concerned units should be discussed and sorted out in EEAC. The meetings of EEAC should be regularly organized and presence of all concerned both within and outside the university should be ensured in the meetings.

15. The functionaries of the Department of Agriculture have acknowledged both direct and indirect help from the university. At the same time, they have a number of expectations from the university. To be realistic, their expectations, particularly, supply of package of practices in a concised form, training facilities in extension methodology and audio-visual aids, developing of low cost technology for small and marginal farmers, etc., are some of the expectations which need to be met with meticulous planning.

16. Majority of the farmers visiting KGKs belong to low to medium age group. It implies the interest of young farmers in crop and livestock farming. Efforts should be made to sustain their interest in farming.

17. Farmers' perception on problems in availing the services of KGKs indicate several types of difficulties encountered by them. Their perception of help available from KGKs (Table 5.27) and problems perceived by them in availing the services of KGKs need to be examined and discussed at appropriate forum for resolving the perceived problems as far as possible.

## Suggested Areas For Future Research

Based on the study in hand, the following areas have emerged for research in future:

1. Study on the analysis of linkages between HODs and ULESs, HODs and DESs, HODs and DEE on independent basis in each case.

2. Study on the extent of percolation of information from subject-matter departments to the concerned units of the Directorate of Extension Education, and the follow up action taken thereon.

3. Study on the time-use analysis of UlESs, DESs and Coordinators.

4. Study on the facilities required by ULESs and DESs which would promote efficient performance on their part.

5. Study on the overall impact of the extension activities carried out by the Directorate of Extension Education all over the State of Haryana.

6. Study on the constraints encountered in the feedback of problems encountered by the farmers in the application of the recommended technology.

7. Study on the factors which dissuade scientists from taking up extension jobs in the field.

8. Study on the communication pattern practised in the Department of Agriculture for transfer of recommended practices to the field functionaries.

9. Study on the training needs of ULESs and DESs.

10. Study on the infrastructural needs at 'Krishi Gyan Kendras' for executing extension education programmes efficiently in villages.

11. Study of the factors which contribute to weakening of the linkages in the technology transfer model.

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## APPENDIX - I

## HARYANA STATE

The Haryana State, which came into existence on November 1, 1966, is one of the leading food-grains producing States of India. The Haryana State is located in North Central part of the country between longitude 74.29° East to 77.30° East and latitude 27.45° North to 33.45° North. The climate of the State is sub-tropical, arid to dry sub-humid, continental and monsoonic. The South-West-monsoon normally sets in by the end of June and cover the entire State before the middle of July. Normal annual rainfall in the State varies from 300 mm in the South-Western region to more than 1100 mm in the northern hilly region of Ambala and Yamunanagar districts. Nearly 75.00 to 80.00 per cent of annual rainfall is received during monsoon season (July to September).

The State has a geographical area of 44,200 sq.km. which is merely 1.40 per cent of the total geographical area of the country. The State has a population of about 16.30 million (based on 1991 census) and about 75.00 per cent population live in rural areas and depend upon agriculture as the main source of livelihood. According to an estimate 60.00 per cent of the total income of the State comes from agriculture. The State comprises 16 districts, 39 administrative sub-divisions, 55 tehsils, 108 community development Blocks, 94 towns and 6745 villages. The population density is 369 persons per km which is above the national average of 267 (1991 census). The State has 1.53 million farm holdings, with an average size of about 2.4 hect. Despite being an advanced State economically, literacy level is only 55.33 per cent which is about 3.00 per cent more than the national average of 52.11 per cent.

Due to the wide variability in climate, soil types and irrigation facilities, a wide variety of crops are cultivated ranging from pearl millet to rice. About 3.8 million hect. area is cultivated annually with 5.7 million hect. (1989-90) of crops sown, thus giving a cropping intensity of 157.00 per cent. An estimated 2.7 million hect. or 74.00 per cent of the cultivated area is irrigated (1989-90). About 70.00 per cent of the gross cropped area is under food-grain crops. The main food-grains crops are wheat, rice, pearl millet and pulses. Sorghum, maize and barley are minor crops. Oilseeds, cotton and sugarcane are also important crops of the State. When Haryana State came into being, it was producing only 25.92 lakh tonnes of food grains, which has now gone upto 91.07 lakh tonnes (1991-92). The Haryana State is contributing 30 to 35 lakh tonnes of food-grains to the central pool every year.

## APPENDIX - II

From

The Additional Director of Extension Education
Haryana Agricultural University,
Hisar-125004

To

The Professors & Heads of
Agronomy, Soils, Entomology, Plant Pathology,
Agril.Engg., Agril.Economics, Horticulture,
Vegetables, Livestock Production & Management,
Veterinary Medicine & Extension.

No. EFH/S/23433-87
Dated: July 23, 1971

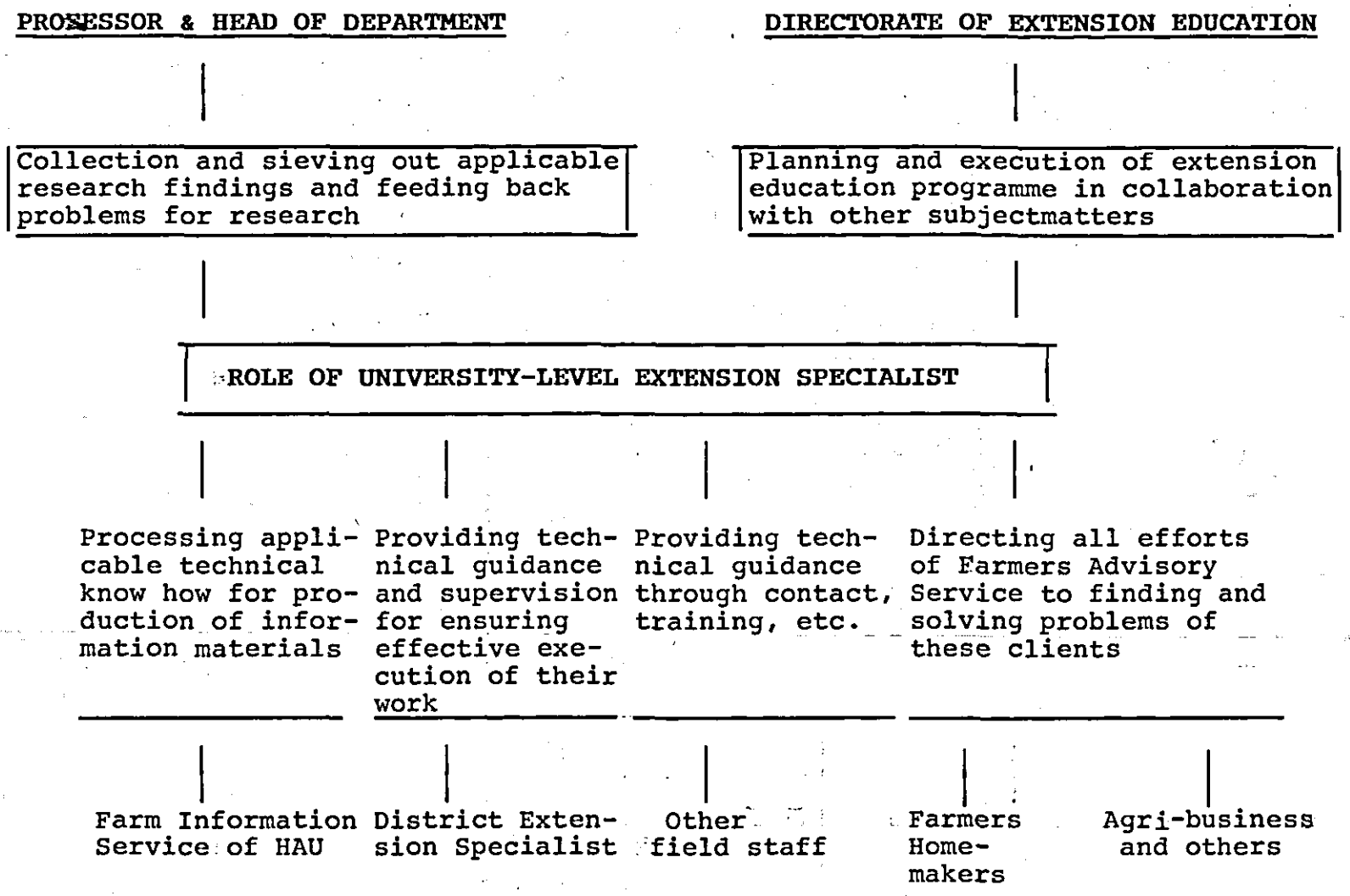
At the meeting with the Vice-Chancellor in the Committee Room of College of Veterinary held on 21.7.71 at 10 AM, the V.C.'s cyclostyled Note was handed over to each one of you. A few typed copies of another Note showing the role of Extension Specialists, their time use analysis and job descriptions prepared by me on the basis of discussions held with the AESs, ESs, and Heads of Departments from time to time, were also distributed. Most of you could not get copies of the same. A copy is now sent herewith. This Note is only tentative.

Encl: As above

Sd/-
Addl.Director of Extension
Education

CC:

1. Extension Specialists
2. Heads of Departments except the ones mentioned above alongwith the notes for information


PROFESSOR & HEAD OF DEPARTMENT
DIRECTORATE OF EXTENSION EDUCATION
Collection and sieving out applicable research findings and feeding back problems for research
Planning and execution of extension education programme in collaboration with other subjectmatters
ROLE OF UNIVERSITY-LEVEL EXTENSION SPECIALIST
Processing applicable technical know how for production of information materials
Providing technical guidance and supervision for ensuring effective execution of their work
Providing technical guidance through contact, training, etc.
Directing all efforts of Farmers Advisory Service to finding and solving problems of these clients
Farm Information Service of HAU
District Extension Specialist
Other field staff
Farmers Homemakers
Agri-business and others

## SUGGESTED TIME-USE ANALYSIS FOR EXTENSION SPECIALISTS (U.L.)

**In a Year:**

| | |
|---|---|
| Total number of days | 365 |
| Number of Sundays | 52 |
| Number of Second Saturdays | 12 |
| Number of other holidays | 19 |
| Number of leave days on an average (Permissible limit 20 casual leaves plus 33 earned leave = 53 days) | 20 |
| Total | 103 |
| Number of work days left | 262 |

**In a Month:**

Average number of work days = 262 ÷ 12 = 22 approximately

| Major work | Number of days (Approx.) | Time percentage (Approx.) |
|---|---|---|
| 1. Collecting and sieving applicable technical knowhow | 4 | 17.00 |
| 2. Processing the knowhow for production of information material | 2 | 9.00 |
| 3. Work in field (by touring) | 11 | 50.00 |
| 4. Other Farm Advisory work at headquarters | 5 | 24.00 |
| | 22 | 100.00 |

## JOB DESCRIPTION OF AN EXTENSION SPECIALIST (UNIVERSITY-LEVEL)

### I. Collection of latest knowhow in his subjectmatter

For keeping abreast with the latest research findings in his and related subjectmatters at HAU and elsewhere - findings that are applicable in the field and useable by his clients. The following measures are to be followed:

1. Regular study in the Library of HAU, Directorate of Extension, concerned College and Department. This study should cover all books and periodicals pertinent to the above purpose. Special attention should be paid to HAU Journal of Research, Annual and other reports of the Department concerned, Theses, Terms Papers, etc. in the concerned Department.

2. Attend Departmental meetings, Seminars, Symposia, Colluquia, Workshops, Summer Institutes, etc. relevant to Extension Education in his subjectmatter, that may be held at Hisar or elsewhere. The Head of Department will keep the ES informed of these under intimation to DEE.

3. In each departmental meeting of the concerned Department, the Head of Department will keep two fixed items on the Agenda - (a) Transmitting applicable knowhow to the Extension Specialists, (b) Collecting field problems for research from the E.S.

4. The Head of Department will give the ES a programme for his visit to each experimental field, laboratory, and those incharge of research projects in the Department, after taking into account their availability for the ES. The ES will follow this programme to discuss necessary details.

5. As and when problem arises, the ES will consult the concerned technical official in the Department.

### II. Sieving and processing of latest technical knowhow in his subjectmatter

While following the measures described under I, the E.S. will:

1. Take notice emerging out of the above measures.

2. Examine each Note carefully and spell out the exact use that the Note is to be put to.

3. Discussing above Notes with concerned officials, like DEE, Head of the Department, AESs, research workers, AIO, etc. for seeking clarification and determining use.

4. Fix up priorities of action on different Notes.

5. Prepare draft write-ups on new aspects in easily understandable language for preparation of leaflets, bulletins, success stories, articles and visuals.

6. Spell out list of illustrations needed for each write-up in consultation with information staff.

7. Handover the write-up and illustrations to AIO sufficiently in advance for production so that it is ready before the time it is needed.

8. Workout a schedule for use of each information material in Extension Education programme.

9. Implement and execute the above schdule.

**III. Preparing and implementing training programmes in his subjectmatter**

1. Prepare, in consultation with Professor and Head concerned, exhaustive list of aspects on which training is needed by farmers, home makers, agribusiness mean, and field personnel*.

2. For each aspect, spell out the content, list out the appropriate university officials who can deliver the content, desirable duration of the training, particular time of a year that is most suitable for arranging the training.

3. Discuss the above details with the Superintendent, Junior staff school, work out detailed lesson plans for each lecture/practical/discussion/demonstration, etc. Training aids to be used should also be clearly spelled out.

---

* The term 'Field Personnel', wherever used in these notes means the technical staff of the Departments of Agriculture, Animal Husbandry, Development & Panchayats, Co-operation, Irrigation, Forestry, Fishery, etc., as may be pertinent to the respective subjectmatter.

4. Work out date and time schedule as well as detailed plan of work for each training course in consultation with Superintendent,Junior Staff School so that each training fits in well in the total schedule of trainings at the Junior Staff School as well as in each district so that one training does not upset any other programme. This scheduling has to be done for one full year in the month of October of the preceding year and got approved from the DEE.

5. The approved schedule should be announced in the Haryana Agricultural Handbook, Haryana Kheti and other publications of HAU and in local newspapers, radio and to panchayats offices, etc., as the case may be with the help of AIO.

6. Arrangements should be made to ensure effective implementation strictly according to this schedule. Assigning specific responsibilities and roles to specific officials is essential.

7. Separate list of training courses should be prepared venue-wise. For example, those at the Kisan Ashram at Hisar, Krishi Gyan Kendras, Farmers' Training Centres, Sites of National Demonstrations, Field Days, in villages, etc. Classification of courses group-wise and enterprise-wise should also be shown.

**IV. Organizing and implementing extension education programme in field in his subjectmatter**

1. Prepare a full year's Extension Education programme for the subjectmatter in October of the preceding year in consultation with the Professor. This programme will also include their aspects described earlier.

2. Programme of different subjectmatters will be finalised at a meeting of the Extension Specialists, corresponding Professors, and DEE.

3. The field programme should clearly specify the different responsibilities of the AESs and ESs in the matter of developing a model village(s), Demonstration Centres, National Demonstrations, other result and method Demonstrations, Varietal Trials, Adaptive Research Trials, Field Days, Training Programmes, Farmers' Meetings, Distribution of literature, attending to written, and verbal querries of farmers, preparation and issue of monthly calendar of operations, other handouts, articles, etc., distribution of and enrolling subscribers to university publications, touring schedule and other routine matters.

4. For effective implementation of the field programme in districts, the Extension Specialists will tour all the districts according to scheduled programme approved in advance. While on tour, they will perform the tasks listed under point VI.

**V. Other farm advisory work at headquarter**

1. Regular feed to Farm Information Service as outlined under II. Timely submission of articles for HAU magazines, supplements, newspapers, etc., write-ups for inclusion in Haryana Agricultural Handbook, Package of Practices, evolving and issue of a model monthly and weekly calendar of operations for different weeklies, monthlies, etc., should be paid particular attention. Variations for different agro-climatic zones should be clearly indicated in this calendar.

2. Regular issue of subjectmatter tips of utility to AESs and other field personnel.

3. Initiating and follow through actions emanating from tour reports.

4. Ensuring prompt action on correspondence received from Krishi Gyan Kendras, farmers, Professors, DEE, Information staff, etc.

5. Listing technical equipment, materials and other facilities required by AESs, procurement thereof, and ensuring timely supply to destination.

6. Preparing budget requirements in respect of their subject-matter based on approved extension programme in consultation with Professor and submitting these to DEE at stipulated time.

7. Tabulation and analysis of different reports received from AESs - monthly, quarterly and annual.

8. Timely communication of the above reports, together with the observations and description by the ES to the concerned quarters.

9. Co-ordination of work of AESs of different districts for giving advantage to all districts of a good idea introduced in one district. While uniformity and conformity will be desirable, flexibility may be necessary in some cases to take care of variability of the area.

10. Stimulating and ensuring co-operation by AESs of his subjectmatter to AESs of other subjectmatters. This is necessary in securing complementary support of other subjectmatters to his subjectmatter and also for inculcating team's spirit and harmony. Afterall relating each subjectmatter to others so that everything is part of one whole is essential for benefitting the client who is common to all of us.

11. Be responsible to the respective Head of Department for the accuracy of the subjectmatter.

12. Broadcast radio talks.

**VI. Tasks to be performed by E.Ss. while on tour**

1. Find out and list problems of different areas in so far as his subjectmatter is concerned.

2. Find out and list shortcomings, bottlenecks, problems, obstacles, lapses, difficulties, etc., encountered by the AESs.

3. Communicate to the Professors concerned under intimation to the DEE the problems as listed under (1) above.

4. Bring the points, as listed under (2) above, to the notice of the concerned officials/people in the university or elsewhere under intimation to the DEE and follow them through so as to iron out them.

5. Meet officials/people in the district who matter for effective implementation of our programmes.

6. Provide technical guidance on problems posed by the AESs.

7. Provide latest additional subjectmatter information to the AESs.

8. Participate in field days, Farmers' Training Camps, District Coordination Committee Meetings, National Demonstrations, District Extension Programme Planning Meetings, Clinical Conferences, etc. as the case may be.

9. Attend to special problems of farmers where the AES is not able to help.

10. Verify facts from periodical reports given by the AESs.

11. Check progress of all projects and campaigns of AESs like Demonstration Centres, National Demonstration Plots, Varietal Trials, Adaptive Research Trials, Rural Clubs, etc.

12. Help AESs in organizing and operating Farmers' Clubs, Poultry Clubs, Kitchen Gardening Clubs, School and Community Gardens, Landscaping of village institutions and waste lands, etc. as the case may be.

13. Visit, with the AESs, institutions connected with agriculture livestock, rural development, e.g. Gaushalas, Milk Plants, Training Centres, etc.

14. Check stocks of inputs and equipments pertaining to the subjectmatter and whether they are being judiciously used and properly maintained. List out defects, damages, losses, detected and take steps to get things serviced/ repaired/written off/condomened and auctioned/replaced.

15. Check AESs' records like Visitors' Book, Library Register, Movement Register, tour programmes, TA bills and actual verification of some tours at random.

16. Maintain complete list of Demonstration Centres, ND Plots, Varietal Trial Plots, Adaptive Research Plots, Training Camps, Field Days, Clubs, Model Villages, Young Farmer Alumni, etc. and keep them upto date for providing an accurate basis for inclusion of places while on tour.

17. Deliver inputs, stationery and other sundry requirements from Hisar campus to Krishi Gyan Kendras. The Directorate Office will be responsible for intimating these lists in advance to the ESs as per their tour schedules.

18. Record observations on germination, crop stand, incidence of diseases and pests in crops and livestocks, nutrient deficiencies, planting of fruit trees and mortalities, inter-cultural and other operations, soil and water management practices, assessment expected yields, observance of recommended Package of Practices, how rapidly soil and water samples are analysed and guidance rendered to farmers, etc., depending on the subjectmatter of the E.S.

19. Comprehensive and precise notes on findings, observations, recommendations, etc., emerging from tours must be submitted by each ES in respect of each tour to the Professor concerned and DEE in forms to be prescribed.

## APPENDIX - III

## QUESTIONAIRE FOR HEAD OF THE DEPARTMENT

**Title of Research: TECHNOLOGY TRANSFER MODEL - AN ANALYSIS OF LINKAGE Project**

**Important Note:** The information/figures to be provided should be based on your performance as HOD

Name of Department _____ Designation _____

1 Educational Qualifications: _____

2 Field of Specialization (if any)

3 a) Have you obtained training(s) in Extension Education?

YES/NO

If yes, give the following information:

| Name of training | Duration | When & where obtained |
|---|---|---|
| | | |

b) How did the training benefit you?

c) Do you feel interested in obtaining a training in Extension Education? If yes, where and for what duration you want to be trained.

4 How do you conceptualize Extension or Extension Education (frankly define the term as you feel and want to) ?

5 a) In your present capacity how much percentage of your time you actually devote to Extension Education functions.

| Sl.No. | Activity | Percentage of time |
|---|---|---|
| i) | Training | |
| ii) | Field Extension | |
| iii) | Any other | |

b) In your capacity as Head of Department in which of the following extension activities you had occasions to participate (Tick-mark).

| Sl.No. | Activities |
|---|---|
| A. | Publications brought out |
| i) | Research Newsletter |
| ii) | Bulletin |
| iii) | Special issue of Haryana Kheti |
| iv) | Special issue of Haryana Farming |
| v) | Paper published in Haryana Kheti |
| vi) | Paper published in Haryana Farming |
| vii) | Research results given for Newsletter |
| viii) | Research results published in proper form in newspapers or elsewhere |
| ix) | Any other related to publication |
| B. | Demonstrations |
| i) | Method Demonstration conducted |
| ii) | Result Demonstration conducted |
| C. | Training Organized |
| i) | Organized in villages |
| ii) | At farmers' field |
| iii) | At KGKs' |
| D. | Group Discussion with farmers |
| E. | Meetings with farmers |
| F. | Visits paid to KGK |
| G. | Visits paid to farmers' field |
| H. | Lectures delivered in training programmes |
| I. | Lectures delivered to farmer's on other occasions |

6 Point out the weaknesses which you have actually observed in implementing extension education work of your Department.

i)

ii)

iii)

iv)

7 Look back into your extension experience and suggest concrete steps which need to be promptly followed for strengthening the linkages in the existing technology transfer model of the university (these could be in the shape of additional funds, functionaries, remodelling of Extension Education Systems, etc.).

i)

ii)

iii)

iv)

v)

vi)

8 Specify the actual functional constraints encountered by you in promoting the Extension Education Programmes of your discipline.

i)

ii)

iii)

iv)

v)

9 List at least five important research findings of your Department which in your opinion need to be passed on to the farmers through the extension agency.

i)

ii)

iii)

iv)

v)

10 List as to which one of the above mentioned research findings you have already managed to have passed on to the farmers and how?

i)

ii)

iii)

11 Give reasons or circumstances which hindered the forwardal of the other research findings to extension agency.

i)

ii)

iii)

iv)

12 In your opinion, what should be the ideal administrative and technical control of the Extension Specialists and District Extension Specialists of your Department.

- Complete control with the Department
- Complete control with the Directorate of Extension Education
- Technical control with the Department and administrative control with the Directorate of Extension Education

13 Do you agree that Extension Specialists and District Extension Specialist should be given teaching and/or research work in addition to their extension duties.

YES/NO

i) If yes, why

ii) If no, why

14 How do you keep your Extension Specialist and District Extension Specialists abreast with the latest research findings?

15 Indicate with a tick mark (_/) as to which of the seating arrangement of ES of your Department is the best in your opinion.

i) Whole-time in Department

ii) Forenoon in the Department and Directorate of Extension Education in the afternoon.

iii) Forenoon in the Directorate of Education and in the Department in the afternoon.

iv) Whole-time in the Directorate of Extension Education.

16 a) Are the extension activities of your department carried out independently or in collaboration with other Department?

b) Name the collaborating Departments.

c) Do you get required cooperation from the collaborating Department?

YES/NO

If No, point out the problems encountered in obtaining required cooperation from the related Departments.

i)
ii)
iii)
iv)

d) How should university strengthen this collaboration?

17 Indicate with a tick mark (_/) the extent of help available from the Directorate of Extension Education in implementing the extension activities of your Department.

Satisfactory

Good

Not to the required extent

(Thank you very much for the cooperation given)

## APPENDIX - IV

**QUESTIONNAIRE FOR UNIVERSITY-LEVEL EXTENSION SPECIALISTS (ULES)**

**Title of Research: TECHNOLOGY TRANSFER MODEL - AN ANALYSIS OF LINKAGES Project**

**Important Note:** The information/figures to be provided should be based on your one year performance as University Level Extension Specialist.

Sl.No. _____ Date _____

Name _____ Discipline _____

1 Actual Field of Specialization:

Master's Level _____

Doctorate Level _____

2 Experience (in years):

| Asstt.Prof. | + Assoc.Prof. | + Professor | + Extension Specialist | Total |
|---|---|---|---|---|
| _____ | _____ | _____ | | _____ |

3 Average no. of days spent on tour during a month _____

4 For most of the times what is the mode of conveyance for undertaking tours. _____

5 Average no. of districts visited in a month _____

6 Average no. of villages visited in a month for supervising the work of District Extension Specialist (DES) _____

(In case no village is visited, say none)

7 a) Indicate some of the shortcomings often observed by you at the time of supervision:

i)

ii)

iii)

iv)

v)

b) How do you help your DES to overcome the shortcomings ?

8 How do you make an assessment of Quantitative and Qualitative changes brought out through the Extension Activities of your discipline?

a) Quantitative changes

b) Qualitative changes

c) Give some concrete examples of Quantitative and Qualitative changes brought out through the Extension Activities of your discipline among the farmers.

i)

ii)

iii)

9 a) Average number of letters received from farmers in a year. ____

b) Indicate the type of advice/feedback sought by the farmers through correspondence (Tick mark).

Technical guidance ☐

Demand for inputs ☐

Personal problems ☐

Any other (specify) ☐

b) On an average within how much period (No. of days) the reply is sent to the farmers.

Within a week ☐

Within a fortnight ☐

Within a month ☐

More than a month ☐

10 a) Briefly indicate the steps followed by in preparing the Annual Programme of Work related to your discipline.

i)

ii)

iii)

iv)

v)

vi)

vii)

viii)

b) Do you discuss the annual programme of work with:

| | | |
|---|---|---|
| i) | Head of Department | YES/NO |
| ii) | Professors in your Department | YES/NO |
| iii) | Faculty members of your Department | YES/NO |
| iv) | DES of your discipline | YES/NO |

c) Do you present a seminar on the Annual Programme of Work?

| | | |
|---|---|---|
| i) | In the Department | YES/NO |
| ii) | Directorate of Extension Education | YES/NO |

11 a) Indicate the Extension Specialists with whose cooperation and collaboration you carry out the extension work at the university level:

i)

ii)

iii)

b) Indicate the name of Departments and persons whose collaboration you need but it becomes problematic to obtain the same.

i)

ii)

iii)

12 Average number of meetings attended by you in an year with the following:

| Official | No.of meetings | Purpose of meeting |
|---|---|---|
| a) DEE | | |
| b) DR | | |
| c) Dean | | |
| d) HOD | | |
| e) DES | | |
| f) Farmers | | |
| g) Private Agencies | | |
| h) Any other | | |

13 Indicate the facilities, authority or powers which in your opinion would make you still more effective in carrying out your job as University-Level Extension Specialists (ULES) and which should be provided to you or vested in you.

i)

ii)

iii)

iv)

v)

vi)

vii)

viii)

ix)

x)

14 How do you utilize your one-third of time?

15 List the number of papers published by you as ES.

| Type of paper | No. | Name of the Journal/Magazine where most of the papers published |
|---|---|---|
| i) Research papers | | |
| ii) Popular/extension papers | | |

16 List at least TEN problems in order of priority which are encountered by you in your routine work and need immediate solution.

i)

ii)

iii)

iv)

v)

vi)

vii)

viii)

ix)

x)

17 a) Are you working on a research project: YES/NO

If yes, name the research project and faculty members in whose collaboration you are working.

b) What type of difficulties you encounter in working on the research project?

i)

ii)

iii)

18 Appointed on the present job through transfer/selection.

19 Do you feel satisfied on your present extension job or want to be shifted to Teaching or Research?

Tick mark (_/) in the appropriate column.

i) Satisfied

ii) be shifted to Teaching

iii) be shifted to Research

20 Do you bring out a monthly Newsletter related to your subject-matter area?

YES/NO

If Yes, with whose collaboration the Newsletter is brought out.

21 How do you keep yourself abreast with the latest advances in your subject-matter?

i)

ii)

iii)

iv)

22 How do you get professional support from your subject-matter Department?

i)

ii)

iii)

23 List the farmers' problems related to farming which you intimated to the Head of your Department during last one year for research and finding suitable solution.

i)

ii)

iii)

24 Name the method, ways and means which are being followed by you for popularising the latest research findings of applicable value among the farmers.

i)

ii)

iii)

iv)

v)

25 a) If you are given an opportunity for undergoing a training programme indicate the specific areas and field of specialization in which you would like to be trained.

| Field of specialization | Duration | Institution |
|---|---|---|
| | | |

b) Are you interested in obtaining training in Extension Methodology?

YES/NO

26 List the facilities which in your opinion should be immediately provided to the DES of your subject-matter to make them work efficiently.

i)

ii)

iii)

iv)

v)

vi)

27 In what way the following wings of Directorate of Extension Education are helping you in the discharge of your duties as Extension Specialist.

i) Training wing

ii) Farm Information and Communication wing

(Thank you very much for the cooperation given)

## APPENDIX - V

**QUESTIONNAIRE FOR DISTRICT EXTENSION SPECIALIST (DES)/COORDINATOR**

**Title of Research: TECHNOLOGY TRANSFER MODEL - AN ANALYSIS OF LINKAGES Project**

**Important Note:** The information/figures to be provided should be based on your performance as DES/Coordinator.

Sl.No. _____ Date: _____

Name _____ Discipline _____ District _____

1 Date of posting on the present post _____

2 Total experience (in years)

| Teaching | Research | Extension | Total |
|---|---|---|---|
| | | | |

3 Appointed on the present post through:

(Tick mark) Transfer/Selection

4 Educational qualifications :

| Degree | Field of specialisation |
|---|---|
| | |
| | |
| | |

5 Trainings obtained (if any)

| Name of Training | Duration | Where obtained |
|---|---|---|
| | | |

6 Average number of farmers in a month who contacted you in Krishi Gyan Kendra (KGK). ____

7 Average no. of days spent on tour to villages in a month ___

8 Frequent mode of journey while on tour (Tick mark):

Public vehicle
University vehicle
Personal vehicle

9 In your opinion what should be the number of days a DES should be on tour in a month.

_____

10 For most of the times do you tour alone or with other DES:

_____

11 How frequently your work is supervised by:

| Supervising Officer | Monthly | Quartely | Half yearly | Yearly | Once in two years |
|---|---|---|---|---|---|
| ES | | | | | |
| HOD | | | | | |
| DEE | | | | | |
| Coordinator | | | | | |

12 Name the agencies at the district headquarters whose collaboration you have obtained during the last year:

i)

ii)

iii)

iv)

v)

13 a) List some farming problems which you intimated to your ES or other authorities at the university headquarters during the last one year.

| Sl.No. | Problem | To whom intimated |
|---|---|---|
| i) | | |
| ii) | | |
| iii) | | |
| iv) | | |

b) What was the feedback/solutions provided to the above mentioned problems?

| Sl.No. | Problem | Feedback provided |
|---|---|---|
| i) | | |
| ii) | | |
| iii) | | |
| iv) | | |

c) What were the steps or methods adopted by you at KGK to bring home the feedback on the problems to farmers?

i)

ii)

iii)

iv)

14 Indicate the difficulties being encountered by you in carrying out your routine work and which need immediate attention of the authorities.

i)
ii)
iii)
iv)
v)
vi)
vii)
viii)
ix)
x)

15 List the facilities which you think need to be immediately provided to make you carry out extension work still more efficiently.

i)
ii)
iii)
iv)
v)
vi)
vii)
viii)
ix)
x)

16 Do you want to continue on your present job? YES/NO

If No, to which position you want to be shifted: Tick mark

Teaching/Research

17 Of your total duty hours, how much percentage of time in an year you spend on:

| Sl.No. | Activity | Percentage of time |
|---|---|---|
| i) | Attending to farmers at KGK | |
| ii) | Tour to villages | |

| Sl.No. | Activity | Percentage of time |
|---|---|---|
| iii) | Tour to HAU headquarters | |
| iv) | Local tour (meeting concerned officials collaborating with you) | |
| v) | Meeting at KGK | |
| vi) | Research work (Data collection/ Report writing) | |
| vii) | Attending to official paper work | |
| viii) | Study of books, journals literature, etc. | |
| x) | Miscellaneous work (specify, if any) | |
| TOTAL | | 100.00 |

18 How do you keep yourself abreast of the latest advances in your discipline/subject?

i)
ii)
iii)
iv)

19 Do you feel adequate library facilities are available at KGK?

YES/NO

If No, list in order of priority the books, journals, magazines of your discipline which should be provided at KGK (provide complete reference)

| S.No. | Name of the book/journal | Price | Address of Publisher |
|---|---|---|---|
| i) | | | |
| ii) | | | |
| iii) | | | |
| iv) | | | |
| v) | | | |
| vi) | | | |

20 a) If you are provided opportunities for obtaining advanced training, indicate the areas of your interest.

| S.No. | Name of the training areas | Duration | Institute |
|---|---|---|---|
| i | | | |
| ii | | | |
| iii | | | |

b) Do you feel that you need training in Extension Methodology?

YES/NO

21 a) Are you working on a research project or adaptive research trials?

YES/NO

b) If yes, provide the following information:

| Name of Research Project | Since Collaborators | Financing Institution | Papers published |
|---|---|---|---|
| | | | |

c) If No, point out the difficulties

i)

ii)

iii)

iv)

22 Indicate as to what information, guidelines, help and assistance you often receive from the following wings of of the Directorate of Extension Education which strengthen the performance of your routine functions:

a) Training Wing

i)

ii)

iii)

b) Farm Information and Communication Wing

i)

ii)

iii)

23 Name the Department, Agencies, Offices whose cooperation/ collaboration is often needed by you in carrying out your routine jobs but you do not get.

| S.No. | Department/Agencies | Reasons for not cooperating (in your opinion) |
|---|---|---|
| i) | | |
| ii) | | |
| iii) | | |

24 Should the DESs in your opinion be given some incentive?

YES/NO

i) If yes, what type of incentive?

ii) Justify the grant of incentive to DESs with some concrete arguments.

25 Procedural steps followed by you in preparing your:

i) Monthly programme of work

ii) Annual programme of work

iii) How and when your annual programme of work is finalised?

iv) How do you ensure to stick to your approved annual programme of work in carrying out your routine duties?

26 Suggest at least TEN measures which in your opinion would make KGKs quite popular among farmers.

i)

ii)

iii)

iv)

v)

vi)

vii)

viii)

ix)

x)

(Thank you very much for the cooperation given)

## APPENDIX - VI

**QUESTIONNAIRE FOR FIELD FUNCTIONARIES OF DEPARTMENT OF AGRICULTURE**

**Title of Research: TECHNOLOGY TRANSFER MODEL - AN ANALYSIS LINKAGES Project**

Designation _____ Total experience _____

1 Indicate the extension-oriented problems which you often encounter in your day-to-day work.

i)

ii)

iii)

iv)

2 a) List some of the crop production problems of serious nature which were intimated by you to your seniors.

i)

ii)

iii)

b) How do you deal with such problems?

i)

ii)

iii)

3 a) In what way, you feel, the university is helping you directly or indirectly in your professional enrichment.

| S.No. | Directly | Indirectly |
|---|---|---|
| i) | | |
| ii) | | |
| iii) | | |
| iv) | | |

b) Do you maintain contact with the university at your level for seeking guidance on the farming problems observed by you while working in the field.

YES/NO

c) If yes, how

- Personal visit
- Through correspondence
- Any other method

d) What in your opinion the university should do for promoting scientific farming?

4 The University organises Agricultural Officers' Workshops (AOWs) before Kharif and Rabi seasons. Do the Officers who participate in these workshops pass on important recommendations to the field functionaries operating at the grass-root level?

YES/NO

a) If yes, how do they do it?

b) If no, how should the Department ensure percolation of recommendations to the field functionaries whose participation is not obtained in the workshops.

(THANK YOU VERY MUCH)

## APPENDIX - VII

## INTERVIEW SCHEDULE FOR FARMERS

**Title of Research: TECHNOLOGY TRANSFER MODEL - AN ANALYSIS LINKAGES Project**

Sl. No. _____ Date _____

Village _____ Block _____ District _____

1. Age _____
2. Education _____
3. Size of land holding _____
4. Membership status _____
5. Self farming/share cropping _____
6. Have you ever visited Krishi Gyan Kendra (KGK) : YES/NO

   i) If no, why?

   ii) If yes, how frequently you visit KGK? (Tick mark)

| Weekly | Fortnightly | Once in a month | Once in two months | Once in three months | Any other |
|---|---|---|---|---|---|
| | | | | | |

a) Indicate the actual purpose for which you visit KGK?

b) Indicate the subject-matter areas whose DES, you often contact at the KGK.

| S.No. | Subject-matter | Approximate time spent with each |
|---|---|---|
| i) | Agronomy | |
| ii) | Agril.Engineering | |
| iii) | Entomology | |
| iv) | Farm Management | |
| v) | Horticulture | |
| vi) | Plant Protection | |
| vii) | Soil Science | |
| viii) | Vegetable Crops | |
| ix) | Animal Sciences | |
| x) | Poultry | |
| xi) | Veterinary Sciences | |
| xii) | Home Science | |

c) To what extent your visit to KGK is beneficial? (Tick mark)

Highly beneficial

Beneficial

Not so beneficial

d) Do you get the required information from District Extension Specialists (DESs) to your satisfaction?

YES/NO

If yes, how

If no, why

7. a) Has any of the DESs ever visit your village? YES/NO

b) Did you contact the DESs, when they visited your village? YES/NO

8. a) Has the KGK ever organised any of the extension activities in your or nearby village?

Yes/NO

b) If yes, name of the activities:

i) Training
ii) Group meetings
iii) Demonstration
iv) Field day
v) Mini Kisan Mela
vi) Campaign
vii) Any other

c) Did you participate in the extension activity organised in your village or in a nearby village?

YES/NO

9. Whom do you contact for seeking information related to crop farming.

i) <u>Formal</u>

- ADO
- DES
- Sarpanch
- Panchayat member
- Any other

ii) Informal

- Dealer
- Neighbour
- Relative
- Progressive farmer of the village
- Nambardar
- Any other

10. a) Have you ever visited the university campus at Hisar?

YES/NO

b) If yes, for what purpose and whom you contacted?

c) Have you ever visited the university campus on any of the following occasions?

- Kisan Mela
- Farm Darshan
- Participation in training
- Any other

11. a) How KGK in your opinion is helping you in improving crop farming?

b) How KGK in your opinion is helping you in improving your livestock production?

12. Name some of the facilities/services which need to be provided to the farmers by KGK to make it still more useful for farmers.

i)
ii)
iii)
iv)

13. Point out some of the problems which you encounter in utilizing the services being provided to farmers at KGK.

14. Do you subscribe to Haryana Kheti/Haryana Farming? YES/NO

i) If yes, since when ...

ii) Whether life member or yearly member ..

iii) Indicate the level of utility for getting information related to crop and livestock production.

Highly informative/Informative/Somewhat informative/Not informative

iv) Have you ever asked for the soltution of your problems through 'Pathak Personouttri' column in Haryana Kheti/ Haryana Farming?

YES/NO

v) Suggestions for improvement, if any.

## ANNEXURE - VIII

## ABOUT THE AUTHOR

Joginder S. Malik son of Shri Dalip Singh Malik was born on April 13, 1967 in village Kinana District Jind (Haryana). Having studied in Snatan Dharam High School, Jind, he did his matriculation in 1981 with 76.77 per cent marks from the Board of School Education, Haryana. For his academic achievements, he was awarded merit scholarship by the Board of School Education.

He was admitted to B.Sc. (Hons.) Agriculture 5 year study programme in College of Agriculture, Haryana Agricultural University, Hisar, in 1981. He completed B.Sc. (Hons.) Agri. study programme in 1986 with an OGPA of 3.15 on the basis of 4.00 (68.11%). Continuing his studies in the same university he obtained M.Sc. (Agri.) Extension Education degree in 1988 with an OGPA of 3.77 on the basis of 4.00 (85.40%).

Soon after having acquired M.Sc. (Agri.) Extension Education qualifications, he got appointed as Sub-Inspector (Executive) in Central Security Force and attended with success one year training programme from National Police Academy, Hyderabad. However, the author had interest in academic pursuits and instead of going for police services preferred to carry out Doctorate studies in Extension Education. He got admitted to Haryana Agricultual University for undertaking Ph.D. Extension Education study programme in 1989.

The author is married to Mrs. Seema daughter of Shri Daljit Singh of village Puthar District Panipat (Haryana).

Presently, the author is working as Assistant Scientist (Extension Education) in the Directorate of Extension Education CCSHAU, Hisar. He has keen interest in sports and cocurricular activities and has to his credit number of prizes and medals for achievements at the State and National levels.

# TECHNOLOGY TRANSFER MODEL - AN ANALYSIS OF LINKAGES

By

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(An abstract of the dissertation submitted for the degree of Doctor of Philosophy in Extension Education, Department of Extension Education, Chaudhary Charan Singh Haryana Agricultural University, Hisar)

The study was conducted in Haryana State. The specific objectives of the study were (1) To study the university technology transfer model in historical perspective, (2) To critically examine the interdepartmental linkages essential for reinforcing and revitalizing the technology transfer model, (3) To determine the adequacy of linkages within and outside the university for efficient feedback, (4) To make an assessment of farmers' perception of the technology transfer system of the university, and (5) To suggest modifications in the existing extension model for quick transfer of technology.

The data were collected from 18 HODs amenable to extension education, 12 ULESs, 84 DESs, 100 field functionaries (comprising SMSs, CAOs and ADOs) and 100 farmers.

Based on the recommendation of Nalagarh Committee, the scheme on the farm advisory service was started during the year 1961-62 with a provision for SMSs in four subjects only. Under this programme, trainings were organized for inservice staff and farmers. The Extension Wing at Hisar started functioning during the year 1964-65. A Junior Staff School was added to this department in 1966-67 for strengthening training activities. After HAU came into being (February 2, 1970) KGKs were set up at all the district headquarters in which a team of DESs was provided for 8 disciplines. With ICAR support KGKs have been converted into KVKs.

Majority of HODs (83.33%) had not obtained training in extension education and there was a need for developing correct concept of the discipline among them. Some of the impedements in the forwardal of research findings to extension agencies were non-availability of funds, for production of HYVs seeds, lack of rapport between department and extension agencies, lack

of faculty members having interest on extension jobs. The functional constraints of HODs in promoting extension work were the shortage of budget, problem of mobility, lack of audio-visual aids, etc.

The ULESs reported increase in the adoption of new technology on continued basis at the level of farmers and pointed out both qualitative and quantitative improvements in extension work. Their problem constituted difficulty in touring for want of a vehicle, shortage of funds for TA and DA, etc.

The monthly programme of work was prepared by DESs based on the needs of the area and resources at their disposal. Majority of them (77.38%) had not associated themselves in a research project. They intimated a number of farming problems to their seniors for investigation. The library facilities at KGKs were not adequate. Most of them pointed out the need for training in extension education. Their problems included lack of budget (80.59%), lack of transportation facilities (64.29%), lack of audio-visual aids (60.71%), etc. Majority of DESs (90.48%) were for the grant of incentive.

The HODs devoted only 5 to 10 per cent of their time to extension work. The shortcomings observed by ULESs on their visits to KGKs were lack of maintenance of records, lack of transport and other facilities, lack of funds for laying demonstrations, etc. For making KGKs popular, DES suggested sale counters for important inputs (80.95%), facilities for training of farmers (45.24%) and a waiting room and stay facilities for farmers at KGKs (19.05%).

The field functionaries acknowledged both direct and indirect help from HAU for their professional enrichment. More than half of them (53.00%) maintained contacts with the university at their individual level.

The utilization of different DESs by farmers in descending order was found to be Plant Pathology (78.00%), Agronomy (72.00%), Entomology (68.00%) and Vegetable Crops (56.00%). While the utilization of DES Home Science was the least (6.00%), DES Veterinary Science (48.00%) was better utilized as compared to his counterpart in Animal Sciences (26.00%).

There was a need for a coherent strategy for implementing the extension activities in the field and efficient feedback of the problems. Modifications in the existing technology transfer model have been suggested.

