AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

PROBLEMS OF COORDINATION AND TRAINING

IN

WEST PAKISTAN AGRICULTURAL EXTENSION SERVICES

BY

SAEED AHMAD
M.Sc.,(Agri)(Pb)

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

DEPARTMENT OF AGRICULTURAL ECONOMICS

1971

To

The Chairman,
Thesis Committee,

The members of the Committee find the thesis submitted by Saeed Ahmad, M.Sc (Agri)(Pb) satisfactory and recommend for the award of degree.

Chairman _____ (Dr. Robert D. Stevens)

Member _____ (Dr. Subbiah Kannappan)

Member _____ (Dr. Allan A. Schmid)

Member _____ (Dr. N. John Ferris)

ABSTRACT

PROBLEMS OF COORDINATION AND TRAINING IN WEST PAKISTAN AGRICULTURAL EXTENSION SERVICES

BY

SAEED AHMAD
M.Sc.,(Agri)(Pb)

In West Pakistan the agriculture sector achieved an annual growth rate of four percent during the Second Plan period (1960-65) mainly through increased supply of irrigation water and fertilizer use. The extension service, though quantitatively improved, but did not play a major role in this development.

The main objective of this study was to analyse the problems being faced by the extension service and to explore the type of extension service suitable for a traditional phase in the development of agriculture.

The study firstly reviewed the steps relating to administrative procedures, organizational set up personal policies and training facilities that were taken by the Government since Independence in 1947. It also discussed the methods adopted to strengthen the Agricultural Extension Service in order to accelerate the rate of development in agriculture.

The historical review of the Agricultural Extension Service helped in indentifying the problems as stated below:

(i) activities yielding low returns such as arranging supplies, preparing schedule of work of plant protection and establishment of model farms mostly on farms of influential rural leaders and large land-owners;

(ii) lack of coordination and supervision, amongst the extension service, agriculture research, Agricultural University and within the extension service:

(iii) to flow of information;

(iv) little emphasis on farmers training programme;

(v) lack of coordinated annual and crop season programme and

(vi) transport facilities and tenure of extension personnel at one place.

On the basis of the detailed discussion of the difficulties and problems faced by the extension service the improvement which were suggested to make it

more effective are as follows:

(i) reduction in activities currently having low returns i.e. transfer of major plant protection operations to private sector and procurement transport and distribution of plant protection material to Agricultural Development Corporation;

(ii) test demonstration on farmers fields in each village be undertaken jointly by the District Chief, Subject Matter Specialists, Research Worker, Agricultural Assistant and Field Assistant;

(iii) improvement in the flow of technical information by suggesting changes in respect of (a) administrative structure so as to strengthen the relationship between education, extension, and research (b) preparation of annual and crop season activity plans with close cooperation of the agencies like research, cooperative, Agricultural Development Corporation, Information Service, Agricultural Machinery Organization, Agricultural University, Irrigation, Agricul-

tural Development Bank, etc, (c) increases in the number of Subject Matter Specialists depending on the requirements of the area; (d) physical proximity of national building agencies, i.e. national building departments and agencies may have their Regional Sub-Regional and low level Offices close to each other and near the other public dealing offices such as, Revenue Office, Post Offices, etc;

(iv) improving the quality of the extension personal through provision of facilties for higher level of education, increases in pay scales, service status and modifications in the promotional procedures;

(v) improvement in education functions of the extension service through training of rural leaders, possibilities of adopting the Comilla approach and by establishing training centres for young progressive farmers.

ACKNOWLEDGEMENTS

The research work presented in this manuscript was accomplished under the supervision and guidance of Dr. Robert D. Stevens, Associate Professor of Agricultural Economics. I take this opportunity to express my deepest sence of gratitude and thankfulness to him. I am also highly thankful to Drs. Subbiah Kannappan, Allan A. Schmid and N. John Ferris, members of thesis Committee for their valuable suggestions and encouragement in accomplishing this research work.

The writer is highly indebted to Mr. M. Shafi Niaz, S.P., T.Pk., Chief, Agriculture & Food Section, Planning Commission, Government of Pakistan for his valuable suggestions and encouragement through out his stay at the campus of Michigan State University. I am thankful to my colleagues working in the Agriculture and Food Section, Planning Commission, Government of Pakistan for their help in providing me the necessary material for undertaking this research work. My thanks are also to Mr. Minhajuddin Khan and Mr. S. Hazrat Pasha, graduate students at the campus.

TABLE OF CONTENTS

CHAPTER		
I.	INTRODUCTION	1
	Area selected for study	5
II.	BACKGROUND DATA ON WEST PAKISTAN	6
	Historical background	6
	Physical condition	9
	Population	10
	Important cultural characteristics	11
	Agricultural background data	15
	1. Land use	15
	2. Soils	17
	3. Rainfall	18
	4. Irrigation	18
	5. Land holdings	20
	6. Crop seasons	21
	7. Crops produced	24
	8. Crop yields	24
III.	THE CURRENT ORGANIZATION AND PROBLEMS FACING THE EXTENSION SERVICE	30
	A- Organizational history	30
	B- Administrative organization and personnel policies	41
	C- Training policies	45
	1. College level	46
	(a) Diploma Course	46
	(b) Four-year Degree Course	46
	2. Institute of Teacher Training and Short Courses, Lyallpur	48
	3. Pre-service training	49
	D- Problems currently faced	52
	1. Problems relating to activities yielding low returns	53
	(a) Plant Protection	53
	(b) Model farms	54

2. Problems relating to coordination and supervision 55
(a) Lack of coordination within the Extension Service 55
(b) Lack of coordination between Extension and Research Services 56
(c) Lack of coordination between Extension and Agricultural University 57
3. Problems connected with flow of information 58
4. Little emphasis on farmer training programme 60
5. Lack of coordinated annual and crop season programs 61
6. Other general problems 61

IV THE ROLE OF AGRICULTURAL EXTENSION IN THE AGRICULTURAL DEVELOPMENT PROCESS 63
A- The Three Phases of Agricultural Development 63
1. Traditional Agriculture 63
2. Transitional agriculture 64
3. The modernized agriculture 65
B- Organizational issues in the Transitional Phase 67
1. Local Leadership and Control 68
2. Multipurpose versus single purpose unit 69
3. Contact with Sources of information 71
C- Training of Extension Personnel 73

V. CHANGES REQUIRED TO IMPROVE THE PERFORMANCE OF EXTENSION FUNCTIONS 75
A- Introduction 75
B- Summary of problems and functions required to be performed by the Extension Service 75
1. Problems 75
2. Functions 77
C- Important Extension Functions and Policies requiring change 78
1. Reduction in activities currently having low returns 78
(i) Major Plant Protection Operations 78
(ii) Marketing and storage 79

2. Improved test demonstrations on farmers' field 79
3: Improvement in the flow of technical information 80
(i) Administrative changes 81
(ii) Improved Annual and crop season activity plans 84
(iii) Increase in number of subject matter specialists 85
(iv) Physical proxmity of technical personnel in operating areas 86
(v) Improved flow of information back to Researchers 87
4. Changes to improve the quality of Extension personnel 87
(i) Education and Training 88
(ii) Pay, promotions and posting 91
5. Improvement in educational function of the Extension Service 93
(i) Training rural leaders 93
(ii) Comilla approach 94
(iii) Examples from Agricultural Development Corporation and Salinity Control and Reclamation Project Areas 96

VI SUMMARY AND CONCLUSIONS 98

1. Reduction in low return activities 99
2. Improved Test demonstrations 99
3. Improvement in the flow of technical information 100
4. Changes to improve the quality of Extension personnel 102
5. Improvment in education function of the Extension Service 102

BIBLIOGRAPHY 104

LIST OF TABLES

Table		Page
1.	Land Utilization, West Pakistan	16
2.	Irrigated Area in West Pakistan, by sources	18
3.	Number of Farms, Farm cultivated Area and Area Cultivated per Farm classified by Tenure and by Regions.	21
4.	Number and Cultivated Area of Farms classified by size.	22
5.	Farms classfied by number of Fragments, and by size.	23
6.	Area and Production of Major Crops	25
7.	Yields per acre of Major Crop in various Countries (pounds per acre)	26
8.	Inputs use during 1959-60 to 1964-65, West Pakistan	27
9.	Consumption of Fertilizers per acre in various countries.	28
10.	Number of Staff positions in the Agricultural Extension Services, West Pakistan, 1965	43
11.	Number of Villages, Farms and Area Cultivated per Extension Worker, West Pakistan, 1965.	44
12.	Pay Scale of Officials in Agricultural Extension Services, Department of Agriculture	45

LIST OF FIGURES

Figure		Page
1.	West Pakistan Administration Units, the Agriculture Extension Organization of West Pakistan, 1966	8
2.	Location of the Institutions providing training for the Agriculture Extension Service, West Pakistan 1966.	51(a)
3.	Existing and proposed linkage system for the Agricultural Extension Service	83

LIST OF APPENDICES

Appendix		Page
A	Monthly Mean Maximum and Minimum Temperature at selected centres, West Pakistan.	108
B	Administrative set up of the Government of West Pakistan.	109
C	Organizational set up of the Department of Agriculture.	110
D	Organizational set up of the Agricultural Extension Services.	111
E	Faculties, Divisions, Institutions and Departments of the West Pakistan Agricultural University, Lyallpur.	112
F	Functions of the Directorates of Agriculure Extension Service and Agriculture Research and Superintending Engineering.	113
G	Organizational set up of West Pakistan Agricultural Development Corporation	114
H	Agricultural Extension Organization in the Tribal Areas of West Pakistan	115
I	United States Extension Service System.	116

CHAPTER I

INTRODUCTION[1]

The common view shared by the majority of economists concerned with economic development is that for balanced and progressive economic development it is essential that agricultural productivity be increased. This viewpoint is particularly applicable to West Pakistan where agriculture including horticulture, animal husbandry, forestry and fisheries contributed more than forty-five percent of the gross product of West Pakistan in the year 1963-64 . Agriculture is the main source of livelihood of more than three-fourths of the population. The agricultural sector must meet the food requirements of a rapidly growing population and must supply raw materials for the industrial sector. It also must supply agricultural products for export to earn the foreign exchange required for importing capital needed for industrial and agricultural development. Furthermore, the level of income of the rural population will in turn determine the rate of growth of the industrial sector because it provides a major market for the manufactured products as development proceeds.

1/ The Agricultural Extension Service used here in this study will refer to Extension Service for crop husbandry only.

The agriculture is largely a subsistence activity with foodgrains occupying nearly seventy percent of the area under major crops in 1964-65. During this period about $144 million were spent to import food and food products.

The growth rate in agriculture sector in both East and West Pakistan during the Second Plan period (1960-65) was about 3.5 percent per annum, which gives less than one percent annual rate of growth per capita against an annual population growth rate of 2.7 percent. This shows that there is a great need for accelerating the rate of growth in agriculture in order to raise the level of living of the people more rapidly.

Agricultural education, research and extension are three basic services that are usually provided by the Government for the development of agriculture. In West Pakistan these three services are mostly the responsibility of t the government. West Pakistan Agricultural Extension Service, part of the British established system, has undergone many reorganizations and changes suggested from time to time to improve its effectiveness during the past nineteen years (1947-66). As a result significant improvement has been achieved especially in quantitative terms. In 1960 each extension worker was covering 15,000 farmers while in 1965 he has to cover only about 1,600 farms. This is similar to the average coverage (1,000-2,000 farms)

of an extension worker in the United States. During the Second Plan period (1960-65), West Pakistan achieved an increase in agricultural production of about four percent a year. This was mainly due to investment in two agricultural inputs - more irrigation water and more fertilizer. The Extension Service, inspite of its quantitative improvements, did not play a major role in this development. This viewpoint is further supported by a study made by Dr. Svinth. He says that "Some progressive land owners told me they never see the Field Assistant assigned to their area. Other told me that Field Assistant is not trained well enough. Some Field Assistants themselves told me that they had only infrequent contact with the Agricultural Assistant working immediately above them and were not receiving a steady flow of new information to answer farmer's question". (35:p 30). This statement indicates some main problems of the Extension Service. These are:

(a) Lack of coordination with-in the Extension Organization;

(b) Lack of coordination among Extension, Education and Research Organizations;

(c) Inadequate and incomplete flow of information;

(d) Inadequately trained extension personnel;

(e) Lack of team approach in action.

The rate of growth in agriculture can be increased through better allocation and coordinated use of the avail-

able resources i.e. skilled manpower, technology, material, lands etc. of the area. Furthermore, their application can be made more effective by importing new technology and material from agriculturally advanced nations of the world. As stated in the previous pragraph the skilled manpower, one of the limited resources in the developing economy, employed in the three agricultural services i.e. extension, education and research is not being properly utilised in the development of agriculture. The present study will focus on an analysis of the problems being faced by the extension service and will explore the type of extension service needed for the transitional phase in the development of agriculture. In the light of this investigation recommendations will be made for improving the working of the extension service by means of better allocation of trained workers, so that it may play more effective role in accelerating the rate of agriculture growth. The role of extension service has become of much greater importance in view of the recent introduction of high yielding dwarf Mexican Wheat and IRRI (varieties obtained from International Rice Research Institute, Phillipines) rice varieties, which require for obtaining maximum yield the application of package inputs including good seed bed preparation, sowing of right quantity of seed

at proper time, at proper depth, timely irrigation, early harvesting and the proper storing of seed.

Area selected for Study

The reason for selecting West Pakistan as the area of study is the author's familiarity with the area and about the work of the agriculture extension organization.

CHAPTER II

Background Data on West Pakistan:-

This Chapter will review the historical events relating to the emergence of Pakistan as an independent and free nation. This will be followed by a description of the geographical and physical features of Province of West Pakistan, its population, social characteristics of rural people and the economic and general conditions of agriculture. The chapter will end with a brief summary.

Historical Background:

The history of Pakistan dates back to 2500 to 1500 B.C. when the Indus Valley was the centre of the civilization as is indicated by the excavations of Haranna - District Sahiwal (Montgomery) and of Mohenjodaro - District Larkana and Kot Diji District Khairpur, West Pakistan. The Muslim rule was established by Muhammad Bin Qasim in 712 A.D. This was followed by Mahmud Gazni's successful military expeditions of the 10th century. As a result of these expeditions, Lahore - now the Provincial Capital, became the centres of Muslim learning and culture. Later on towards the end of the 12th Century, Shahabuddin Ghauri's generals extended the area of the Muslim rule to Bengal and during the 13th century, Dehli Sultanate was established. Lastly, the

Moghal Emperors further extended the bounderies of the empire. During Aurangzeb's (1658-1707) time the whole of the sub-continent of India was under Muslim Rule.

The British who came as traders during the begining of the 17th Century, gradually went on extending their influence and at last with the suppression of the Independence Movement of 1857-1858, they succeeded in establishing their power.

Under British rule, towards the close of the 19th century a joint movement of Hindus and Muslims under the banner of the National Indian Congress was started. Later on the Muslims discovered that the Congress was essentially a Hindu Organization and they were afraid that the Muslims would lose their identity as a seprate nation. Therefore, in 1906 The Muslim League was formed. After years of struggle and negotiations and with the mutual agreement of the Indian National Congress and the Muslim League, the British Government announced on June 3, 1947, the partitioning of Indian sub-continent between the Hindus and the Muslims and thus finally Pakistan and Bharat (India) emerged as two separate free nations on August 14, 1947.

Pakistan consists of two wings, West Pakistan and East Pakistan, divided from each other by about

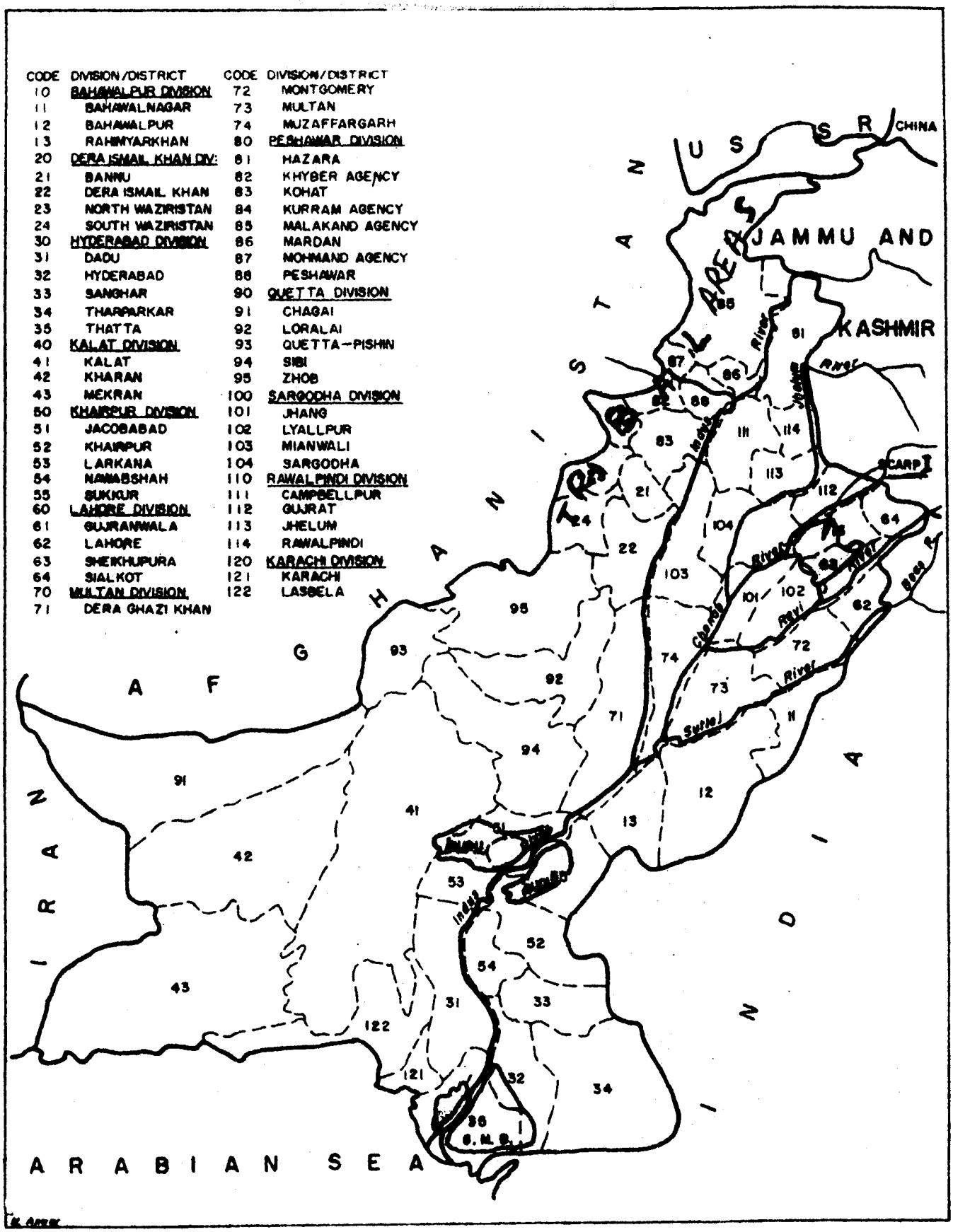


Figure 1. West Pakistan Government Administration Units, the Agriculture Extension Organization of West Pakistan, 1966.

1,500 miles of Indian land and 2,500 miles of sea.

Physical Consitions:

West Pakistan is bounded on the North by the Himalayan mountains. (Fig.1) A narrow strip of Afganistan separates West Pakistan from Russain territory. The Chinese territory is on the North and the East, while on the Western side lies Afghanistan. The southwestern part of West Pakistan has a common border with Iran. On the East, West Pakistan is bounded by Bharat (India), the Arabian Sea lies to the South of the Province. As regards global location, West Pakistan lies between 24°N and 37°N latitude and between 61°E and 75.5°E longitude.

The major part of West Pakistan lies away from the sea and to the north and west there are high mountain regions. The climate, on the whole, is arid and extreme. There are four well defined seasons, but autumn and spring are of exceptionally short duration. The summers are hot, and winter cold and rainfall are generally low. The rainfall as a whole decreases from the Himalayas towards the south. The rainfall varies from four inches a year in the south to forty inches in the north. The summer season lasts from April to September and winter season is from October to March. The temperature

during the summer in the shade may go up to 120°F. and may not fall below 90°F., during the night. During the winter maximum temperature on calm and clearer days may touch 75°., but falls almost to freezing almost to freezing points after mid-night. (Appendix - A)

Population:

The population of West Pakistan, according to the 1961 census, was 42.28 million persons, giving an average density of 138 persons per square mile for the whole province. The distribution of total population of West Pakistan is not even; it ranges from 2 persons per square mile in Kharan and Chagai Districts of Quetta and Kalat divisions to 1,506 persons per square mile in Karachi District, which includes Karachi City. The rate of population growth as estimated between the 1951 census and the 1961 census is 2.7 percent per annum.

According to the 1961 census about 33.23 million persons or 77.5 percent of the West Pakistan population lives in rural areas, while in 1951 census the corresponding figures were 27.81 million persons or 82.3 percent. The urban population was 22.5 percent in 1961 against 17.7 percent of the 1951 census. Thus over the last ten years (1951-1961) there has been a major trend towards urbanization.

The total civilian labour force, which includes persons twelve years and above, is about 32 percent of the total population in the 1961 census: the remaining 68 percent are dependents. It is estimated that of the total civilian labour force about 59 percent or 19 percent of the total population are agriculturist; the rest of the civilian labor force, 13 percent of total population are non-agriculturists. Only 13 percent of the total population of West Pakistan is literate; the majority of these belong to the urban population.

According to the census of 1961, about 97 percent of the people of the Province of West Pakistan are Muslims. The chief minorities are Christians, Budhists, Scheduled castes[1] and Caste-Hinuds[2]. In West Pakistan the people of the plains east of the Indus are mainly Indo-Aryans, and the people of the western side of the Indus are an admixture of Turks and Iranians.

Important Cultural Charateristics.

The study of social characteristcs will provide an

1&2/ According to the law of Manno, the whole Hindu community is divided into four main castes. These are Brahman, Khushetri, Vaishnu and Shudras. The first three constitute cast-Hindus and fourth one-agroup of sub-castes of minial are scheduled castes. This Manoo's classification has been followed in 1961 Population Census of Pakistan. There is, however, no legal bar on scheduled castes to follow any profession in Pakistan.

insights about the family system relating to its working in performing daily jobs and in decision-making about the problem faced by the family or its members.

West Pakistan is primarily an agricultural region; over three-fourth of its people live in villages close to the lands they cultivate. Apart from farmers and agricultural labourers, the village communities also include small numbers of such craftsmen as carpenters, blacksmiths, weavers, shoemakers, etc., who provide local skilled services. Because of poor means of communications usually each village was of necessity largely self-sufficient in all essential goods and services. However, a change towards greater market orientation is being made in rural areas because of developmental activities, especially those of the rural works programm under the Basic Democracies System and those initiated because of the present regime's interest in interest in rural development.

The villages are usually large, the houses, whidh are generally close to each other, are built from mud-bricks. Rural settlement assume compact shape and large size primarily for reasons of security.

The most important institution in rural societies is the extended family system. As long as the head of the family is alive all the sons cultivate jointly under the command of the father. On his death the property

owned by the family is distributed among all the family members in accordance with the Islamic Laws of Inheritance. This is one of the main cause of small and fragmented holdings in West Pakistan. Becuase of children have no management control during the lifetime of the father, they do not develop initiactive and organizing ability.

By working together and living together, obeying a common authority, it is not surprising that the members of a farm family even think alike and have a common view-point on many matters. Individuality and intiative of young people tend to be stifled and needed changes are difficult to achieve.

One of the main characteristics of rural people is that they are generally suspicious of all strangers for in their experience outsiders have usually exploited couhtry people. Government representatives have frequently come only to collect taxes and are, therefore, often looked upon as strangers. It appears to the rural people that private buyers from outside have cheated them by paying too little for the meagre produce they had to sell.

As stated earlier the majority of the farming commounity are illiterate and know only what they can see or hear. They have little contact with the outside world. They are using primitive generations old methods of farming and, inter alia agriculture is not

practiced as a commercial enterprise.

A second important characteristic that can be noted is fear of ridicule. A farmer may be convinced that the new method would increase his yield; still he fears to employ it because should it fail, he will subject himself to the ridicule of his neighbours for having departed from traditional ways. Because the villagers are usually strongly family oriented, any decision to break with tradition and employ a new method must usually be a family rather than an individual decision.

One of the most recent and important institutional developments in the rural areas, through the efforts of the present regime, is the introduction of Basic Democracies System. This system is of socio-political-cum-economic in nature. This system aims at making of better use of rural leadership, group them together and involve them in the management of the affairs of the State, including the day-to-day administration of the local administrative set up in order to create confidence, sense of participation of belongingness to the state.

This system consists of four tiers, i.e. the Union Council, Tehsil Council, District Council and the Divisional Council. Of these, the Union Council and the

District Council have the executing functions, while the other two are the coordinating agencies. The Union Council is the lowest tier and is, on an average, for five villages. Usually it is composed of ten elected members. One of the ten is subsequently elected as the Chairman of the Council. Under the system smaller constituencies representing 1,000 - 1200 people have been created so that at the time of election everybody knows the qualities of the person he is voting for. In the other three councils fifty percent or more of the members are elected, while the balance are the official members. The chairman of the District Council is the Deputy Commissioner, the district head of civil administration, the vice-chairman is elected by the members. The District Chief of Agricultural Extension is one of the Official members of the District Council. Each department submits its schemes concerning to the improvement and for further development of the area to the District Council for approval and the council also reviews periodically the performance of the on-going schemes.

Agricultural Background Data

1. Land Use

The total area of West Pakistan is 198.67 million acres (Table 1). Analysis of the present pattern of

Table 1: Land Utilization, West Pakistan

(million acres)

Region	Geographical	Reported	Total	Net sown	Current fallow	Total	Culturable waste	Forest	Net available for cultivation
Northern	32.34	15.96	6.67	6.13	0.54	9.27	3.21	0.92	5.14
Central	43.80	34.63	21.29	19.17	2.12	13.34	7.62	0.31	5.41
Southern	122.53	49.83	13.47	8.09	5.38	36.36	13.27	1.84	21.25
West Pakistan	198.67	100.40	41.43	33.39	8.04	58.97	24.10	3.07	31.80

Source: Government of West Pakistan, Bureau of Statistics, Planning and Development Department, Lahore "Statistical Handbook of West Pakistan", 1965, pp. 372-73

land use shows that of the total land area of roughly 199 million acres, about 50 percent is classified as non-reporting which means that there are no records of this area available. It is not even known whether or not this area grows any crops. Three-fourths of this area is in the Northern Region. Of the remaining 100 million acres, for which land utilization data are available, about 41 percent is cultivated and 24 percent is classed as culturable waste, which means that it can be brought under plough if the necessary facilities are available. About 3 percent of this land is under forests.

2. Soils

The agricultural production largely depends upon the nature of the soil. Most of the soils of West Pakistan are sedimentary and have been formed by the deposition of material carried by water and hence termed alluvim. The soils in the plains are mostly loams except sandy deserts of Thal (part of Mianwali, Sargodha and Muzaffargarh Districts) and Thar, the south-western border belt of the Province. Near the mountains the soil is usually gravelly and sandy. On the whole the soils of West Pakistan are alkaline in nature. A detailed soil survey of the entire Province is being performed in order to formulate a uniform

system of soil classification. The survey will provide the basic data regarding the physical and chemical characteristics of the soils, their potential productivity and suitability for different crops, fertilizer needs and methods of cultivation requirements. This will facilitate the work of extension service in recommending package input uses.

3. Rainfall

In West Pakistan except for the sub-mountain strip in the north, rainfall is erratic and insufficient during major parts of the year. Even where the rainfall is good, irrigation works are needed to protect agriculture by regulating the water supply.

4. Irrigation

The total irrigated area constitutes nearly 66 percent of the total cultivated area of the province (Table 2)

TABLE 2

Irrigated Area in West Pakistan, by sources

(thousand acres)

Region	Total irrigated area	Area irrigated by					
		Govt. Canals	Private canals	Tanks	Tube-wells	Wells	Other sources
Northern	1897	1031	492	1	11	283	79
Central	15811	13618	10	42	160	1651	330
Southern	9526	6726	71	2	4	8	2715
West Pak	27234	21375	573	45	175	1942	3124

Source: Government of Pakistan, Planning Commission, Agri. & Food Section, Handbook of Agricultural Statistics, June 1964, pp. 58-59.

The table shows that of the total irrigated area of 27.2 million acres, or about 78 percent, is served by canals, about 12 percent is covered by other sources of irrigation, and about 7 percent is irrigated by persian wheels or wells.

As is indicated by the data, canals are the main source of irrigation. If proper care is not taken, this source of irrigation can cause a great deal of harm to the land. The seepage from canals and irrigation systems, floods, poor drainage systems, and the application of lower quantities of water than required for leaching of the soil salts, are considered to be the causes of water-logging and salinity. According to a rough estimate every hour sees another twelve acres of canal-irrigated land going out of cultivation, approximately 100 thousand acres every year . (1:p:61) Measures such as provision of drainage facilities, construction of a network of tubewells are being adopted for checking the spread of this twine menace. In order to have adequate and assured water supply, tapping of underground water through installation of tubewells, is attracting the attention of the farmers, and government is also supporting the program by subsidizing the cost of installation. The number of tubewells has increased from 1,650 in 1960 to 5,750 in 1965.

5. Land Holdings

Agriculture in West Pakistan is normally a business of small farming units. The cultivated area per head comes to less than one acre. This shows the pressure of population on agriculture. There are about five thousand farm holdings, of which nearly 50 percent are in the Central Region, 31 percent in the Northern Region and 18 percent in the Southern Region. The average size of the farm holding is 8 acres of cultivated area. (Table 3)

Of these five thousand farm holdings, 41 percent are owner operated, 42 percent tenant and the balance of 17 percent are owner-cum-tenant holdings. In respect of size, the owner-cum-tenant are cultivating on an average 10 acres, owner operated 6 acres and tenant 8 acres of cultivated land. The holdings in the Southern Region are on the whole of larger size, it is representing mostly a newly colonised area, while in the Northern Region the size of holdings ranges from 3 acres in respect of owner operated and 8 acres of owner-cum-tenants.

The analysis in Table 4 shows that the small farmer up to five acres which constitute nearly 49 percent of the farms have only 11 percent of the total cultivated farm area. Eight percent of the farms have 25 acres covering 35 percent of the cultivated area.

Table 3: Number of Farms, Farm Cultivated Area and Area Cultivated Per Farm Classified by Tenure and by Regions

	Northern Region		Central Region		Southern Region		West Pakistan	
Farms	Thousand	Percent	Thousand	Percent	Thousand	Percent	Thousand	Percent
Owners	757	50	990	40	251	30	1,998	41
Owner-cum-Tenant	355	24	405	16	74	8	834	17
Tenant	386	26	1,109	44	533	62	2,028	42
Total	(1,498)	100	(2,504)	100	(858)	100	(4,860)	100
	-- thousand acres --							
Cultivated Farm Area								
Owner	2,020	32	6,584	33	3,390	32	11,994	32
Owner-cum-Tenant	2,724	43	4,375	22	1,558	14	8,657	23
Tenant	1,626	25	9,197	46	5,776	54	16,599	45
Total	(6,370)	100	(20,156)	100	(10,724)	100	(37,250)	100
	-- acres --							
Cultivated Area Per Farm								
Owner	2.7		6.6		13.5		6.0	
Owner-cum-tenant	7.7		10.8		21.1		10.4	
Tenant	4.2		8.3		10.8		8.2	
Total	(4.3)		(7.9)		(12.5)		(7.7)	

Source: Government of West Pakistan, Planning and Development Department, Bureau of Statistics, Lahore, "Statistical Handbook of West Pakistan", 1965, pp. 328-329.

Fragmentation is also a problem, one that caused difficulties in efficient operation. Sixty percent of the farms are fragmented, these hold nearly 80 percent of cultivated farm area (Table5). Of the fragmented farms, 54 percent have 2 or 3 fragments; 20 percent report 4 or 5 fragments, 15 percent report 6 or 9 fragments; and the remaining 11 percent have 10 or more fragments.

Table 4 : Number and Cultivated Area of Farms Classified by size

Size of Farm (acres)	No. of farms (thousand)	Per-cent	Culti-vated (thousand acres)	Per-cent
Under 1.0	742	15	267	1
1.0 to under 2.5	856	18	1,154	3
2.5 to under 5.0	806	16	2,535	7
5.0 to under 7.5	581	12	3,126	8
7.5 to under 12.5	759	16	6.489	17
12.5 to under 25.0	729	15	10,710	29
25.0 to under 50.0	286	6	7,387	20
50.0 to under150.0	88	2	3,886	10
150.0 and over	14	less than .5	1,694	5

Source: Government of West Pakistan, Planning and Development Department, Bureau of Statistics, Lahore "Statistical Handbook of West Pakistan", 1965, pp. 330-331

6. Crop Season

In West Pakistan, owing to large variation in temperature, there are two distinct crops seasons Kharif, the summer and Rabi, the Winter. Kharif crops are generally sown between April and June and harvested during the

Table 5: Farms Classified by Number of Fragments and by Size

Size of Farm (acres)	Number of Farms							Farm area		
	Total	Not fragmented	Total	2-3	4-5	6-9	10 & over	Total	Not fragmented	Fragmented
	-- thousand --									
West Pakistan	4,860	1,195	2,995	1,578	599	456	312	49,930	9,493	39,437
Under 1.0	742	568	174	156	15	3	-	335	235	100
1.0 to under 2.5	856	466	389	289	69	27	4	1,345	689	656
2.5 to 5.0	806	299	507	298	111	73	25	2,911	1,072	1,839
5,0 to 7.5	581	186	395	203	85	70	37	3,546	1,123	2,423
7.5 to 12.5	759	196	563	286	115	99	73	7,357	1,875	15,482
12.5 to 25.0	729	151	578	255	125	106	92	12,533	2,487	10,046
25.0 to 50.0	286	41	246	82	60	55	49	9,468	1,243	8,225
50.0 to 150.0	87	8	80	17	17	21	25	6,539	517	6,022
150 and over	14	1	13	2	2	2	7	44896	252	4,644

Source: Government of West Pakistan, Planning and Development, Department, Bureau of Statistics, Lahore, "Statistical Handbook of West Pakistan", 1965, pp. 338-339

months from October to December. The main crops of this season are rice, maize, millets, cotton and sugarcane. The Rabi crops are sown in October and November ~~and~~ November and harvested in April to May. Wheat, oilseeds and gram among the pulses are the main crops of this season.

7. Crops Produced

Food grains occupy 50 percent of the total area under cultivation, of which the wheat crop alone has a share of 30 percent (Table 6). Among the cash crops cotton and sugarcane are the important ones, and their share of the total cultivated area is 8 percent and 3 percent, respectively. These data show that agricultural production in West Pakistan is largely subsistence, foodgrains having the major share of cropped area.

8. Crop Yields

The yields per acre of major crops in West Pakistan are very low when compared with other countries of the world (Table 7). The comparison provides an idea of the increase in yields which may be possible to meet the increased demand of agricultural products.

Increases in yields can be achieved through use of more inputs and better methods of farming. The use of inputs in West Pakistan since 1959-60, the last year of

the First Plan to the end of Second Plan i.e. 1964-65 are given in Table 8. During this period there has been an increase of about 35 percent in the use of chemical fertilizers. Under plant protection operations the area covered by curative measures has shown an increase of 140 percent, while the area sown with treated seed against seed and soil borne diseases varied greatly during 1959-60 to 1964-65. Plant nutrients consumed per acre in West Pakistan when compared with other countries of the world show a very low level of consumption (Table 9). Thus there is great scope of increased use of these inputs to raise the productivity of agriculture in West Pakistan.

Table 6: Area and Production of Major Crops(a)

Crops	Area (thousand acres)	Production (thousand tons)
Wheat	12,307	4,085
Rice	3,075	1,141
Maize	1,185	485
Other food grains (Millets)	3,726	697
Oil seeds(b)	217	82
Sugarcane	1,158	15,600
Cotton	3,460	2,011(thousand bales)
Tobacco	111	158(million pounds)

(a) Data pertaining to five year average ending 1964-65
(b) Oilseeds include sesamum, rape and mustard seed.

Source: Government of Pakistan, Planning Commission, Agri. & Food Section, "Handbook of Agricultural Statistics", 1964, pp. 70-109.

Table 7. Yields per acre of Major Crop in Various Countries
(pounds per acre)

	Wheat	Rice (paddy)	Maize	Barley	Cotton	Tobacco	Linseed
France	2,812	3,624	2,098	2,571	-	1,598	562
Italy	1,741	4,606	3,267	1,143	286	1,312	777
U.S.S.R	943	2,470	1,180	1,170	652	1,340	-
Canada	1,214	-	4,500	1,473	-	1,760	536
Mexico	2,276	1,848	973	723	607	1,160	803
United-St States	1,580	4,098	3,508	1,821	520	2,276	482
Brazil	786	1,357	1,036	821	143	750	714
China-Taiwan	1,875	3,260	1,875	1,151	330	2,035	-
India	653	1,437	884	652	107	759	205
Japan	2,187	4,600	2,080	2,241	134	2,312	303
Pakistan	741	1,500	964	545	232	1,089	411
Turkey	946	4,258	1,312	1,036	428	571	598
United Arab Republic	2,464	4,500	2,473	2,393	741	-	902
World	1,134	2,848	1,800	1,393	303	1,036	384

Source: F.A.O. Production Yearbook, 1965, pp. 39-152

Table 8 : Inputs Use During 1959-60 to 1964-65, West Pakistan

	Fertilizer (N - P - K)	Improved Seed distribution	Plant Protection Curative Measures	Plant Protection Preventive Measures (a)
	-thousand tons -		- thousand acres -	
1959-60	19.4	27	1,350	2,322
1960-61	31.4	84 (b)	1,242	2,573
1961-62	37.5	54	935	1,875
1962-63	40.2	7	1,530	1.875
1963-64	68.7	28	2,700	2,000
1964-65	87.2	31	3,228	2,100

(a) Area sown with treated seed against seed and soil borne diseases.
(b) Includes a sizeable quantity of sound seed distributed for resowing in addition to the distribution of improved seed.

Source: Government of Pakistan, Planning Commission, "Evaluation of the Second Five Year Plan, 1960-65", May 1966, pp. 53-55.

Summary

Pakistan emerged as an independent and free nation as a result of the partition of Indian sub-continent on August, 14 1947. West Pakistan is one of the two provinces of Pakistan and lies between 24°N and 37°N latitude and between 61°E and 75.5°E longitude. The climate is arid and extreme with quite low and uncertain annual precipitation. The two main seasons are the Winter from October to March and the Summer from April to September, which correspond to the two crop seasons the Rabi and the Kharif.

Table 9 : Consumption of Fertilizers per acre in various Countries (Pounds per acre)

Countries	Nitrogen (N)	Phosphoric(P)	Potassic(K)
Belgium	155	123	170
Denmark	55	40	60
France	34	12	42
Italy	23	23	34
Sweden	39	14	28
United Kingdom	70	56	52
U.S.S.R.	7	5	6
Canada	3	5	2
Mexico	7	2	0.3
United States	21	15	13
Brazil	3	4	4
China-Taiwan	140	37	36
India	3	1	0.3
Japan	107	77	88
Pakistan	3	0.3	0.1
Turkey	23	18	0.6
United Arab Republic	81	17	0.4
World	9	8	7

Source : F.A.O., "Production Yearbook", 1965, pp 299-307

According to 1961 Census, the population of the Province is about forty-three million, giving an average density of 138 persons per square mile. The majority of the population is Muslim. More than three-fourths of the people live in villages close to the piece of land they till. People are mostly family oriented. The literacy percentage is only 13 percent. The eldest male being the head of the unit and almost all the decision-making powers relating to family matters rest with him. The Basic Democracy System, socio-political-cum-economic in character, has been introduced by the present regime for tapping the available potential local leadership and to prepare rural people to manage and shoulder the affairs of the State.

Agriculture is the main occupation of the people. The soils are mostly alluvium in character. Agriculture production is subsistence in nature, with food crops occupying more than fifty percent of the cultivated area. Agriculture is a business of small fragmented operational units. The rainfall is scanty and uncertain. The canals are the main surce of irrigation. Crops yield are very low, and non-farm input use is a recent development.

CHAPTER III

THE CURRENT ORGANIZATION AND PROBLEMS FACING THE EXTENSION SERVICE

This chapter will contain a brief description of the historical development of the Extension Organization in West Pakistan and will also review the policies concerning the training and administrative aspects of the organization. This will be followed by a discussion of the problems currently faced by the Extension Service.

A. Organizational History

The Agricultural Extension Service in West Pakistan dates back to the British period in India. The period thereafter is followed by a period of continous changes in the organization with the purpose of making the Extension Service more efficient and beneficial to the farmers and the nation.

At the time of Independence in 1947, the Western Wing of the country was composed of the following Muslim majority areas : (a) North West Frontier Province (N.W.F.P.); (b) Sind including Karachi Federal area ; (c) the Western part of the Province of Punjab; (d)the centrally administered areas of Baluchistan State Unions; (e) three Princely ruled States of Bahawalpur adjoining

the Punjab, Lasbella and Khairpur adjoining Sind and (f) also the Tribal Areas of the Frontier Region. The Agricultural Extension Service inherited was a part of the British Indian Extension Service. The majority of the staff of the then Directorate of Agriculture representing Extension, Research and Teaching were non-muslims. After Independence all government servants were given the option of serving either Pakistan or India. By and large all Muslims decided to serve in these areas and all non-muslims, except the local Christian population, to move to India. This created a serious gap and resulted in shortages of the well-trained and qualified staff. The agricultural administration, research and training as well as teaching mostly had been centered in all India institutions, almost all of which had their headquarters in what is India today. Many Professors, teachers, research and extension workers deserted the colleges, directorates and research institutes in the geographical area of West Pakistan. In order to maintain and operate these institutions and departments, higher posts had to be filled by rapid promotions which made the organization at the lower levels ineffective. Furthermore, most of the technical libraries were in India. The only well equipped

library in Pakistan was at the Punjab Agricultural College, Lyallpur. Unfortunately most of it was destroyed by fire at the time of Independence.

Each Province - Sind, Punjab, North West Frontier Province and the Baluchistan States Union, and also many of the States on the eve of Independence, had their own separate Directorate of Agriculture with Extension, Education and Research branches. There were only two agricultural colleges in 1947, one at Lyallpur (Punjab) and the other at Tandojam (Sind) with some additional agricultural teaching facilities at Islamia College, Peshawar (N.W.F.P.)

In order to bring the various administrative organizations of these areas into some uniform pattern, to provide better coordination with a view to accelerating the rate of development and also for economic reasons, these administrative areas were merged into one unit - the Province of West Pakistan - in October, 1955. The Directorates of Agriculture of these areas were integerated and placed under the administrative and supervisory control of the Director of Agriculture, West Pakistan, with headquarters at Lahore. The Directorate was organized into Teaching, Extension, Research, Plant Pro-

tection, Agricultural Engineering Services, etc.

The Extension Service was still responsible, as under the previous set up, for arranging the supplies of fertilizer, improved seed, implements and for transporting, storing and then finally distributing these inputs through the departmentally appointed agents, to farmers. In addition to these responsibilities, the service was also assigned to advise and assist the farmers in the adoption of new and improved farming techniques.

The Agricultural Teaching was mostly confined to the three Colleges at Lyallpur, Peshawar and Tandojam. In addition to the degree courses, some of these colleges, especially Lyallpur, offered short pre-service training courses for the lowest level of workers, the Field Assistants in the Extension Service.

The plant protection activities were performed by the Provincial as well as Central Plant Protection organizations. The Central organizations was responsible for the supply of chemicals, plant protection equipment and also assisting in large scale spraying operation. The function of aerial spraying, locust control, inter-national commitment and pesticide research were also the functions of

this organization. The provincial plant protection set up was under the administrative control of the Director of Agriculture, West Pakistan. However, the lower field staff of this wing was an addition to the extension service at the local level. These were, however, administered by Deputy Director, Plant Protection from the Provincial Directorate.

The Agricultural Engineering branch was added to the Directorate during the early fifties to operate tractors and bull-dozers for cultivation and land cleaning, to sink tube-wells and to popularise improved implements. In order to make this unit more effective the existing fleet of Government - operated tractors was strengthened and seven agricultural workshops were set up for the operation, maintenance and repair of machinery, the training of mechanics and the operators and for allied research during the First Plan period, 1955-60. More agricultural machinery was procured during the Second Plan, 1960-65, andt these seven

workshops were reorganised and strengthened further. Six new sub-shops were established to cope with the continuous expansion of the program.

One of the main causes of the low rate of development in agriculture during this early period (1947-55) was the shortage of well qualified staff and trained personnel. Political instability was also an important factor. According to the First Plan of December, 1957, "there is a dearth of trained men in agriculture and the provincial governments are unable to find men to fill all the sanctioned posts in their establishments. Some of the colleges are not able to attract all the pupils they are intended to accommodate. The relatively low salaries, the minor status of the department, the lack of satisfaction which comes from a sense of achievement and brightening prospects in other fields as a result of expansion and development are some of the important factors which detract from the attraction of work in Agricultural Deprtments" (13:p 214). The plan suggested that the inadequacy of technical staff should be remedied as far as possible by appropriate emergency measures.

This situation continued throughout the First Plan.

The Second Plan document stated in 1960:

"Failure to achieve the major targets of the First Plan was due to several causes not the least important being the personnel policy in the government agricultural services that militated against attracting and retaining a corps of talented techinicians. By and large, the government machinery for implementing a strong development effort in agriculture was not suited to the times, nor to the scale of the problems; sound principles of administration were not consistently observed in the agricultural sector during the First Plan period" -1955-60 (14:P 128)

Considering and analysing all these factors, the present government of Pakistan appointed in July, 1959 the Food and Agriculture Commission. One of the terms of reference of the Commission was:

"to recommend any improvement in agricultural education and research and, above all, in the methods and organization for transmitting the knowledge of better agricultural practices to the cultivators through the agricultural extension services, Village Agricultural Industrial Development (Village AID) Organization, etc". (11: p 2).

The Commission submitted its report in November, 1960. The report states that :

"Almost universally in our tours in the country farmers complained that they never saw the agricultural extension staff or when they saw them had no great confidence in their ability to be of much service". (11:P 155).

The Commission was also of the view that the Field Assistant, the lowest man in the tier of extension, has on an average to cover one hundred thousand acres. This, again, means that firstly there was a shortage of staff and secondly, they were not suitably trained as they were

unable to win the confidence of the farmers. According to the analysis of the Food and Agriculture Commission, the possible causes of this situation were that :

"government fertilizers supplies are forwarded to these godowns on consignment and the agents are required to pay at regular intervals for the quantities that they sell. Often a long interval goes by without payment for the sums due are useful to the merchant as capital for other transactions. Somebody then had to dun the merchant to pay, to check his stock, to see what he ought to pay and to watch that he does not adulterate or sell short weight bags. Nobody is provided for these supply line jobs and the responsibility for stores and stocks falls on the front line extension staff. In these circumstances, stores checking can be a very great burden and when, in addition, large numbers of reports and returns have to be sent in monthly to headquarters, every excuse is provided for turning the field job into a desk job" (11: p 23) (a)

(a) The author worked as an Agriculture Extension Agent from 1958-1961 in the Department of Agriculture, Karachi Federal Area. In addition to the advisory job the functions assigned included duties like arranging supplies of seed and fertilizer their sale to farmers, keeping of stocks, and for maintaining of accounts. This was because during that time there were no departmentally appointed agents. These non advisory functions normally consumed much of the time of the extension worker. In order to be relieved of these duties, the author assigned this job to one of his staff members. One day when the author was away from the office on an advisory job. The fellow responsible for the sale of fertilizer actually sold four bags of fertilizer, but issued receipt for two bags. One of the other staff members became suspicious and expressed the same to the author on return. On enquiring from the purchaser the next day this was found to be true. Such happeninhs often kept the extension worker busy in functions like checking the stocks and maintaining accounts. Thus under these circumstances the worker could not perform the advisory job properly.

On the two parallel organizations for Plant Protection and Extension the Commission states that :

"in each district a Senior Plant Protection Assistant has under him a Plant Protection Assistant in every Tehsil, each with 4 or 5 Field Assistants, so that in toto they exceed the agricultural extension staff. But instead of coming under the control of the district agricultural chief and through him the remainder of the front line staff, they take orders direct from an Assistant Plant Protection Officer posted at divisional headquarters, who is controlled by the Deputy Director of Plant Protection at Lahore. if the staff were merged, more men would be available for extension and all could be trained in Plant Protection" (11: P 39)

In 1961 the government took action on this and both these services were integrated into one organization.

Another development of major importance took place in 1961. On the recommendations of the Food and Agriculture Commission, the Government established the West Pakistan Agricultural Development Corporation an autonomous body under the Secretary of Agriculture. One of the functions assigned to this organization is the development of agriculture through timely and increased supplies of inputs and technical information. In order to achieve these objectives the corporation was asked to establish two wings, the Supply Wing and the Field Wing. The Supply Wing was made responsible for the production or procurement, transportation and distribution of improved seed,

fertilizer, improved implements and other supplies needed by the farmers throughout West Pakistan. The Field Wing was given the job of overall development of specified areas - "Project Areas" to be declared by the Government through an ordinance on the recommendation of the Corporation. The Commission was of the view that by transfering the functions of supplies of inputs to the Corporation the present Departmental Extension Service would be freed from the duties of receiving, checking, distributing and accounting for fertilizer and other supplies, and would be able to fully devote themselves to their main work of extension in the field.

In July 1962, the government took another step towards improving the operational efficiency of the Agricultural Department. At this time three agricultural regions, i.e. Southern, Central and Northern, were created. Thus, accordingly, the Directorate of Agriculture, West Pakistan, was reorganised to suit the new situation. The the Director of Agriculture, West Pakistan, was redesignated and appointed as Agricultural Advisor

to the Secretary of Agriculture. In each region a Director for Agricultural Research and another for Agricultural Extension were appointed. The Agricultural Engineering and Teaching Institutions were also placed under the administrative control of the Director of Agricultural Extension.

The Extension Service for the Tribal Areas remained under the administrative control of the Secretary, Home Department, with the provision that the Director of Agricultural Extension, Northern Region (Peshawar) will provide the necessary technical assistance whenever needed.

On the recommendation of Revell's Report (3:p 32), another autonomous body, the land and Water Development Board, was created in June 1963, to deal with the problem faced by farmers in water logged areas. The additional Chief Secretary, (Planning and Development Department) was made chairman of this Board. Then in 1964 under this Board a project organization was established for SCARP-I (Salinity Control and Reclamation Project, Number - 1) to provide assistance to the farmers in improving the agricultural conditions in the area. Recently the Government created a new Dep-

partment of Land and Water Development, within the Provincial Secretariat, to which the Board has to report its progress. The Chairman of the Board is the Secretary and the Governor himself is in-charge of this new Department.

Thus in West Pakistan today four different Governmental ar Semi-Governmental agencies are operating in the field of Agricultural Extension. These are :

1. Agriculture Department Extension Service for settled Districts;

2. Agricultural Development Corporation which is carrying out extension functions in newly colonised Project Areas. It also has responsibilities for the supply of inputs throughout West Pakistan.

3. The Land and Water Development Board responsible for providing extension facilities in Salanity Control and Reclamation Project areas;

4. Home Department which supervises the Extension Service in Tribal Areas.

The charts showing the organization set up of each and their relationship with higher Provincial Administrative Units are given as appendices (B - H) to this study.

B. Administrative Organization and Personnel Policies.

For Agricultural purposes the Provinces of West Pakistan has been divided into three Regions -

Southern, Central and Northern. In each region the Extension Service is headed by the Director of Agriculture (Table 10). Under him at the Divisional level are the Deputy Directors of Agriculture generally with a team of eight specialists. At the District Level are the Assistant Directors each with a team of three specialists to assist and supervise the work of the Agricultural Assistants, normally three to four per Tehsil. Each Agricultural Assistant - in turn has to provide technical guidance and assistance to about six Field Assistants, the key sub-personnel field worker, one in each Union Council.

The Agricultural Development Corporation and the SCARP Extension Services have drawn their extension workers from the mother servide, the Agricultural Department and have a generally similar pattern of organization. The one major difference in organization is that each Project Area under the Corporation involves opening up of new lands and colonization, under the direction of a Project Director. Therefore, extension work in the A.D.C., is focused on new lands and newly settled farmers. The SCARP Extension Service has about double the extension workers per million cultivated acres.

TABLE 10

Number of Staff Positions in the Agricultural Extension Services, West Pakistan, 1965

Region/ Department	Director	Deputy Director (Divisional	Specialist at Divisional	Assist. Director (District)	Specialists at District level	Agri. Assistants	Field Assistants	Total Personnel
Northern								
Agri. Department	1	3	24	10	30	106	584	758
Tribal Areas	-	1	3	3	11	23	72	113
	1	4	27	13	41	129	656	871
Central								
Agri. Department	1	4	32	15	53	242	1,629	1,976
SCARP Areas	-	1	-	3	4	17	200	225
	1	5	32	18	57	259	1,829	2,201
Southern								
Agri. Department	1	5	32	15	44	174	795	1,066
Agri. Dev. Corp.	1	2	13	7	-	60	191	274
	2	7	45	22	44	234	986	1,340
West Pakistan								
Agri. Department	3	12	88	40	127	522	3,008	3,800
Agri.Dev.Corp.	1	2	13	7	-	60	191	274
SCARP Areas	-	1	-	3	4	17	200	225
Tribal Areas	-	1	3	3	111	23	72	113
Grand Total	4	16	104	53	142	622	3,471	4,412

Source: Svinth C.A., "Strengthening Agricultural Extension in West Pakistan, 1965-70" November, 1965, p. 14.

The Field Assistant of the Department of Agriculture on an average has to cover nearly twelve villages or 1,600 agricultural farms or on average basis nearly 14 thousand acres of cultivated land (Table 11) .

Table 11

Number of villages, Farms and Area cultivated per Extension Worker, West Pakistan, 1965.

	Northern Region	Central Region	Southern Region	West Pakistan
Number of Villages	12	12	15	12
Number of Unions	1	1	0.7	1
Number of Agri.Farms	2,290	1,500	1.070	1,600
Geographical Area (acres)	49,300	26,800	151,700	66,000
Cultivated Area (acres)	10,170	13,000	16,800	13,800
Net Sown Area (acres)	9,350	10,470	10,100	11,100

Regarding promotional procedures to higher posts, heavy weight is given to the length of service in the organization. The annual pay increases are fixed in amount and are granted normally on the recommendation of the immediate higher official in the organization. The monthly pay scales for the various posts of the Organization are given in Table 12.

Table - 12.

Pay scale of Officials in Agricultural Extension Service, Department of Agriculture.

Name of Post	Pay per month		
	Starting Pay	Annual Increment	Higher Limit
Director	Rs.1600	50	1700
Deputy Director	Rs. 750	75 and Technical Pay Rs.165/-	1500
Assistant Director	Rs. 350	35	925
Agri. Assistant	Rs. 275	15	500
Field Assistant	Rs. 125	6	215

(One rupee/Rs is equivalent to nearly 21 cents U.S.)

C. Training Policies

A brief review of the educational system - institutions and the study courses offered by these organizations - relating to agriculture will assist in gaining an insight into the academic qualifications of the personnel employed by the Agriculture Department. This will enable us to know more about the skills and capabilities with which they are equipped. The efficient performance of the job greatly depends upon the quality and the level of education of working force.

The personnel serving the existing Agricultural Extension service have two levels of education. The College level and the non-graduate level in which workers have only had some pre-service training in Agriculture. The first category includes 792 officials ranging from Agricultural Assistant to the Head of

the Organization and the latter category represents 3,000 field level workers - the Field Assistants.

1. College Level

The College level education for an extension worker starts after High School Graduation, i.e. after Matriculation. Under this category, depending upon the duration of time, two types of study courses are followed, the two-year diploma course and four-year degree course (B.Sc.).

(a) Diploma Course

This was a two-year course, which used to be offered before Independence. Upon completion of the course a diploma (L-Ag) was awarded to the trainess. They were usually employed as Category 'B' Agricultural Assistants. Among the present personnel of the Department of Agriculture, only a few may be of this level of education. The First Plan (1955-60) recommended re-establishment of a two-year course in the three Agricultural Colleges as one of the measures to meet the shortage of trained personnel for the Research, Extension and Teaching Services (13:p.277). Apparently no action was taken to this effect by the colleges or the Government.

(b) Four-year Degree Course

The majority of the personnel above Field

Assistant now serving in Extension, Research and Teaching Services have at least B.Sc. Degree in Agriculture. This four-year program remained in operation upto 1962 in the three colleges, Tandojam, Peshawar and Lyallpur (Fig 2,p52). The regular four-year Degree Course was composed of two levels as under:

Subjects offered under Four-year Degree Course

Period	Subjects
First Year	Agriculture (Soil formation, Classfications etc) Botany Physics, Algebra & Trigonometry, Land Surveying, Chemistry and English.
Second Year	Agriculture (Irrigation) Chemistry, Botany, Zoology & English (Qualifying examination in Carpentry)
Third Year	
i) Majoring in Botany	Agriculture (Dairy Science) Botany as major subject, Chemistry as minor.
ii) Majoring in Chemistry & Entomology	Agriculture (Dairy Science) Chemistry or Entomology as major, Botany as minor (Qualifying examination in Veterinary Sc)
Fourth Year	
i) Majoring in Horticulture Botany and Chemistry	Agricultural (Crop Science), Botany or Horticulture or Chemistry as major Entomology as minor & Agricultural Economics.
ii) For Majoring in Entomology	Agricultural (Crop Science), Entomology as major, Chemistry as minor and Agri. Econ. (Qualifying Exam. in Agricultural Engineering)

The training period was extended after 1961 to five years in accordance with the recommendations of the Commission on National Education. The Agricultural College, Lyallpur was converted into West Pakistan Agricultural University in November, 1961. A different pattern of courses is being offered to the trainess at the University. The University has by now established :(a) five agriculture faculties - (i) Agricultural Science, (ii) Agricultural Engineering and Technology, (iii) Animal Husbandry, (iv) Veterinary Science and (v) Agricultural Economics and Rural Sociology; (b) a Division of Basic Sciences and Arts; (c) a Directorate of Advanced Studies and Research and (d) an Institute of Teachers Training, Extension and Short Courses.

2. Institute of Teacher Training Extension and Short Courses, Lyallpur.

This Institute has the Department of (i) Teacher Training; (ii) Agricultural Extension and (iii) Short Courses. The Institute is responsible for training all the students of the University in Agricultural Extension Work, and is also offering facilities for M.Sc. Studies in this branch. An additional function is to develop good relations

with the forty Teaching and Research Departments of the University in order to make available to the farming community the results of research from each specialised field. It also assists in developing better liasion with the farming community so as to relate the work at the University to the needs of the people. The first batch of students graduating under this new pattern of training were available for appointment in 1966.

From this review of the training policies followed in the past we note that the Department of Agriculture Extension now has a great majority of personnel without proper training in Extension techniques.

3. Pre-service Training

A one year course was offered to the field level workers i.e. Makaddams, who are now designated as field assistant. This course was offered in local language. The trainees selected for the course were required to know how to read and write. The requirements were raised and only high school graduates (Matriculates) were selected for the course. The preference was given to rural youths over the urban

oriented ones. On sucessful completion of the course the trainees were awarded a certificate in agriculture.

In the begining this course was offered at the Agricultural College. The subjects were Botany, Zoology, Entomology, Chemistry, Agriculture (Crop husbandry, dairy, etc.) and Economics. The training had heavy emphasis on theory and was supplemented with laboratory and some field work in agriculture.

On the recommendations of the Food and Agriculture Commission, The Government in 1961 decided to abolish the Village Agricultural and Industrial Development Organization (Village AID). This program was initially launched in 1953, with a view to raise the productive capacity and income of the villagers through better methods of farming and the expansion of cottage industries, to multiply social and community services, to create a spirit of self-help initiative, democracy, leadership and cooperation in the villages and to encourage social activities including recreation for men and woman. This organization had its own Training Institutes for field level workers. These Institutes were at Peshawar, Quetta and Rahimyar Khan. When the Village AID organization was terminated, these Instit-

utes were transfered to the Agricultural Department for use as pre-service training of the Field Assistants.

Presently the Agriculture Department has five Institutes. These locatedeat Peshawar for Northern Region; at Rahimyar Khan and Sargodha for Central Region and at Quetta and Sakar and for the Southern Region (Fig 2). Each of these Institutes has an attached farm for practical work. These Institutes are under the administrativecontrol of the respective Regional Directors of Agricultural Extension.

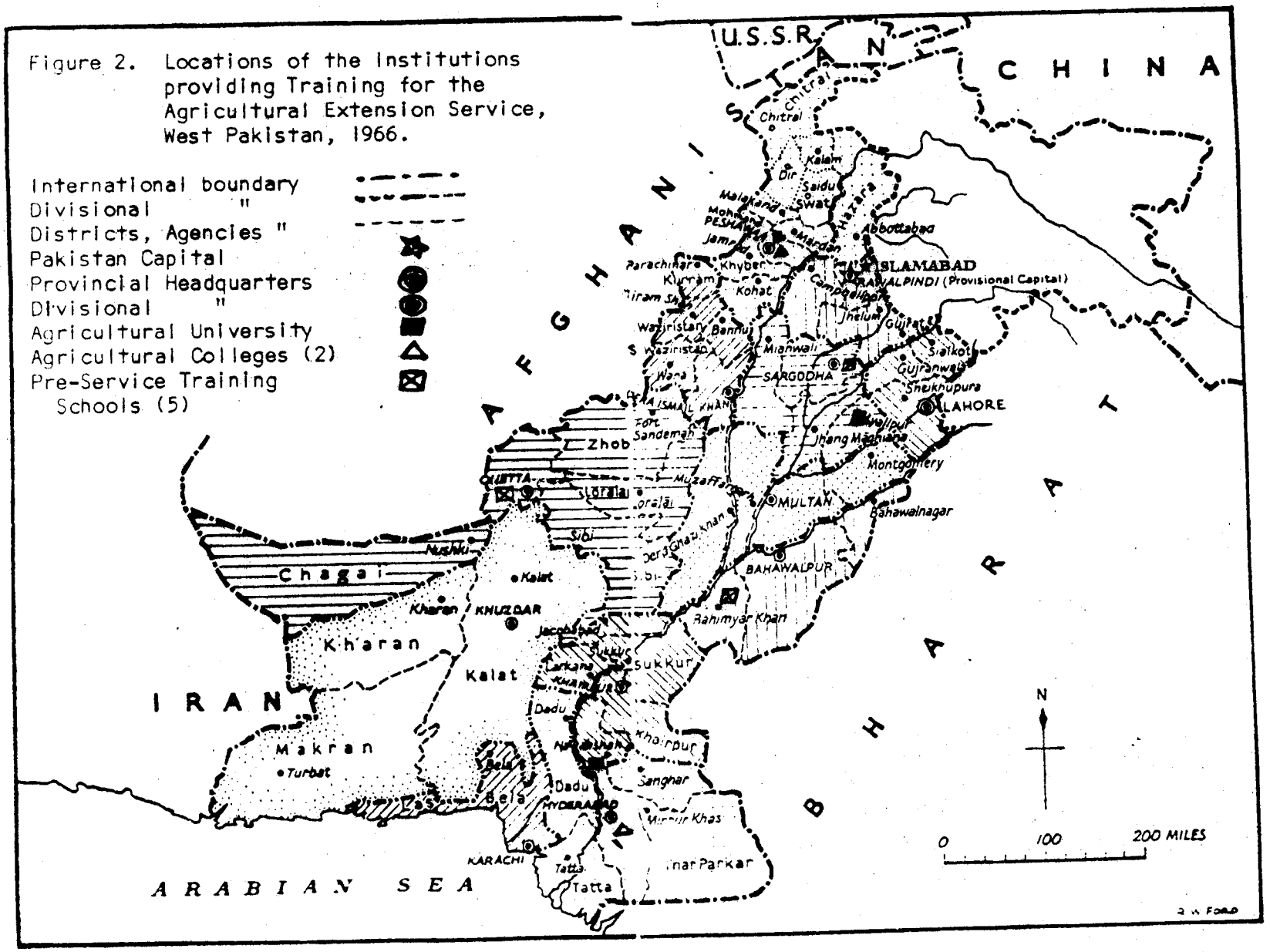
The faculty of each Institute is inadequate and some of the staff members have no experience in extension work, others have only one to three years service experience in the extension field.

The inadequacy of staff members, in other words, means large classes of the trainess and thus less emphasis on practical field work. Dr. C. A. Svinth described the training methods as,

> Each of the Institute has an attached farm for practical field training, but some recent graduates, with whom I talked in the extension service, observed that their lessons in the Institutes had not been closely geared to the actual work they would be asked to perform after they entered Government service". (35 : p.49)

In order to improve the situation the Government

Figure 2. Locations of the Institutions providing Training for the Agricultural Extension Service, West Pakistan, 1966.



51(a)

has recently decided to expand the duration of the course to two years and also to provide some new buildings at some of the Institutes, especially Sargodha, which is presently using the buildings of a derelict cavalry station. Some of the institutes have begun to use an "internship system", to spend Saturdays as an apprentice in the field with a more experienced extension officer.

The Commission on National Education has summed up this situation as :

"The present status of the colleges is an inheritance from the past with the function of training high grade technicians for a specific government position. We are convinced that agricultural education in Pakistan cannot achieve its fulls stature under the present system of control by a government department, whose officers are not educators and are already heavily burdened with administrative matters, and where the colleges are divorced from the atmosphere of scholarship and research which should characterize all higher education". (12 : p.84)

D. Problems Currently Faced

Under this heading discussion of current problems facing the extension organization in performing the various functions will be taken up. These can be governed under the following categories:

(1) Problems pertaining to activities yielding low returns;

(2) Problems relating to coordination and supervision;

(3) Problems connected with flow of information;

(4) Little emphasis on farmer training program;

(5) Lack of coordinated annual and crop season program;

(6) Other general problems

1. Problems relating to activities yielding low returns.

This category includes the problems faced in carrying out the plant protection activities and in establishing model farms.

(a) Plant Protection

A major function being performed by the Extension Service is the carrying out of plant protection measures, which are free to the farmers. It consumes more than half of the total time of the Field Assistants, in arranging supplies, preparing the schedule of work, talking to farmers about their problems and results of plant protection. The coverage of area by these measures, according to the Planning Commission's estimate, is only about fifteen percent of the total cultivated area of the province. Dr. Mendivil, Plant Protection Advisor to the Provincial Government, observed that this is a very high cost for a service with such a low coverage. He also added that :

"an efficient plant protection programme depends upon a continous flow of information regarding pest population to ensure that the proper type of

chemical is applied in the proper dosage at the proper time. In Pakistan crops are apprently treated at predetermined intervals without any recourse to such information." (28 : p.7)

Accoring to another survey conducted by Hunting Technical Serives Limited and others about three fourths of the farmers do not apply pasticides for lack of availability of the service(22:p.30).

The other shortcomings of the program are that the chemicals are not handled properly and storage facilities are enadequate. Stores often lie in the open air exposed to light, high temperature and humidity. The pesticides are transported to the field for application by the Field Assistant on bicycles, without taking necessary precautionary measures like using gas masks, using of antidotes, etc.

(b) Model Farms

One of the methods used in WestnPakistan for transmitting information about new techniques is to set up model farms. These farms are supposed to be established on progressive farmers land. The Extension Service provides assistance to these farm demonstrators in applying all the

improved farming techniques. Other farmers of the area are encouraged to visit these farms to observe the effect of using new and improved techniques versus old ones in increasing production. In the past these farms had been limited in number and were mostly on farms of influential rural leaders and larger land owners. According to Dr. Svinth;

> "a very large amount of time of both the Field Assistant and the Agricultural Assistant is going into one or two model farms".

He further stated that:

> "no successful extension system in the world has concentrated its efforts so heavily on so few farms" (35:p.21)

2. Problems Relating to Coordination and Supervision.

(a) Lack of Coordination within the Extension Service.

Functions like plant protection measures, setting up of model farms, holding of agricultural shows and exhibitions, contacting farmers, etc., are mostly performed by the Field Assistants who constitute nearly eighty percent of the total extension force. In performing these functions very little help is available from the Agricultural Assistant, the next higher officer to him, who has

to supervise about six Field Assistants.

At the next higher level, the District Agriculture Officer hasto guide about thirteen agricultural assistants and has to look after the day to day office routine work. Because of the heavy administrative requirements in some cases it has'nt been possible for the District Officer to tour his area. Dr. Svinth reports:

"I found EADA's (Extra Assistant Director of Agriculture - the District Agricultural Officer), who had not visited all their Agricultural Assistants for Several months. I found Field Assistants who had not worked jointly with their Agricultural Assistants for six months. These may be exceptional cases" (35:p.22).

This indicates the lack of coordination and week supervision in performing the extension activities and also lack of team approach.

(b) Lack of Coordination between Extension and Research Service.

The team of subject matter specialists at the district level which includes a man from Horticulture, Plant Protection and Marketing seems to be inadequate in view of the key position of the District Staff in the agriculture development process especially in the initiation and preparation of Development Programme. In performing these activities

the Extension Service is not receiving the necessary and required technical support from the Specialists. The possible cause being that they may not be in close touch with the research service. Dr. Waddle, Advisor, Cotton Improvement Programme, says that :

"While much lip service is given to cooperation, there actually seems to be very little. For example, one botanist stated that the Director of Extension had not been on the Research Station this year. Furthermore, that no extension efforts were made to encourage farmers to view the results of the station's experimental work". (36: p.10)

This indicates that there is lack of cooperation between the Extension and Research Services.

In laying out the demonstration plots on farmers' land very little assistance is being provided by research workers. Two goals would be achieved through more participation by research workers, first the plots would present a better scientific demonstration and second research workers would become better informed about farmers' problems.

(c) Lack of Coordination between Extension and the Agricultural University.

The West Pakistan Agricultural University, Lyallpur, which is responsible for both teaching and the research in natural and social sciences, is under the Department of Education. There seems to be little coordination between Department of Agri-

culture and the University as stated by Dr. Svinth:

"The strained relations connected with the 1962 separation of Ivallpur University from the Agriculture Department, are rapidly dis-appearing, and it is now possible for the two organizations to share staff and facilities, and work out joint programmes to a much greater degree than in the recent past". (35:p.46)

The lack of coordination is further supported by the absence of representation of the Department of Agriculture on any of the executing bodies of the University. The Academic Council and the Committee for Advanced Studies and Research responsible for providing assistance to the Board of Syndicate of the University in policy matters relating to education and research have no representation from either the Extension or the Research Services of the Department except the Seeretary, Agriculture, who is a member of the Syndicate (37: Appendix P.2) While the Commission on National Education recommended that :

"the new Universities should include representatives of the Department of Agriculture, Animal Husbandry, of Forestry in their various academic and executive bodies. Indeed, the Directors of these departments should be ex-offico members of the governing councils of these universities" (12:p.84)

3. Problems Connected with Flow of Information

For efficient performance of extension functions continuous flow of incormation in two directions,

flow of information from research workers to farmers and from farmers to researchers, is very essential. The flow of technical knowledge is very sporadic. The information available crrently through the Agricultural Information Service, though it contains useful material, is in some cases out of date and in others incomplete. The possible cause of the incomplete information seems to be a lack of coordination among the various disciplines of the Directorate of Research. The Annual Technical Report on Accelerated Wheat Improvement Programme, 1965-66, describes that :

"Within each Institute there is need to organize an inter-disciplinary research group, comprising the geneticist, agronomist, entomologist, pathologist, agricultural chemist and whatever other skills are available including engineers and irrigation specialists. Much less progress has been achieved in 1965-66 along this line, since each section of an Institute has been by tradition an independent operation, and it is difficult to pool the skills" (31: p.43)

Such isolation cannot produce effective plant breeding, since the object of plant breeding is to incorporate in one plant the adjustments to soil, water, disease, insects, etc., that the commercial grower requires.

Furthermore, the results of the isolated research are mostly tested on Government farms or at the sub-stations of the Research Institutes.

They are usually not verified under farmers' field conditions. Dr. Mendivil while describing the present plant protection research says:

"Although Pakistan has some well trained theoretical entomologists, there is a great need for more people trained in the application of research results under field conditions for solving the problems faced by farmers"(28:p.12)

Drs. Narvez and Borlaug state that :

"In 1965-66 the three Agricultural Research Institutes in West Pakistan for the first time had ten to twelve semi-commercial wheat plots for each region on private farms" (28:p.39)

This is one of the causes why information that is available to Extension Service is inadequate and incomplete.

There is also weak backward flow of information from Extension to Research Service because of infrequent contacts between the two organizations.

4. Little Emphasis on Farmer Training Program

It seems that the farmers training programs have gained little attention from the Department of Agricultural Extension. Farmer training is one of the fastest ways of spreading new ideas among a farming community. A recent survey done by F.A.O. 1965 points out that schemes for farmer seminars are

spreading rapidly in many countries and have proved highly successful (35:p.68). These trained farmers will be unpaid extension workers at the village level.

5. Lack of Coordinated annual and crop season program.

The programmes now generally followed by the Extension Service lack coordination of supporting and complementary input supplying agencies like the Agricultural Development Corporation - responsible for seed, improved implements and fertilizer supplies, the Agricultural Development Bank - fulfilling the credit needs of farmers, the Rural Cooperative Supply Corporation supplying fertilizer and offering short-term credits for agricultural development, the Agri-cultural Machinery Organization responsible for land development and providing tubewell boring facilities, the irrigation and the Revenue Deprtments and the Water and Power Development Authority for the supply of power for agricultural purposes and information on water resources development.

6. Other general problems

~~Other general problems~~

These problems include lack of transport facilities, especially for the Field Assistant, lack of office and residential accommodation, no promotional

opportunities to Field Assistants and generally low service status relative to other Departments.

Another problem concerns the tenure of extension personnel in one place. A survey conducted in 1964 in East Pakistan and as quoted by Mr. Wilson in his "Technical Report on Agriculture", states that the average tenure of the Union Agricultural Officers was about four and a half months and that of the Thana Agricultural Officer was about five months. The position might be better in West Pakistan, but still the usual policy of transferring personnel after two or three years needs careful re-appraisal. The average tenure of extension workers in the United States for example varies depending upon the nature of the job assigned. The average stay for Home Economics worker is two to three years; 4-H workers four to five years; Resourde Development agent seven to eight years and for Agricultural Extension agent over ten years.

CHAPTER IV

THE ROLE OF AGRICULTURAL EXTENSION IN THE AGRICULTURAL DEVELOPMENT PROCESS[1]

Theories about the agricultural development process may help shed light on and focus the role of the agricultural extension service in the development process. In this chapter a phase theory of agricultural development is reviewed briefly. From the review certain implications about the productive role of Agricultural Extension are drawn.

Dr. Mellor has divided the phase theory of agricultural development into three phases. These phases are : (a) traditional agriculture, (b) transitional agriculture or low capital technology, and (c) modernised agriculture or high capital technology. The main characteristics of each of these phases are given below.

The Three Phases of Agricultural Development

(1) Traditional Agriculture

The traditional agriculture is characterised by stagnant technology. Generations old methods of farm-

---

1/ This Chapter mostly based on Dr. John W. Mellor's " The Economics of Agricultural Development", 1966 Cornell University Press, pp. 223-360

ing are follwed. Expansion in production occurs primarily through the application of more labour, but often with declining income and productivity per unit. Its main feature is that agricultural production increases to meet the increased demand for agricultural products due to population growth.

(2) Transitional Agriculture

The transitional phase of agriculture has been characterized by low capital intensity in technology. The other main features of this phase are as follows:

Agriculture still has a large share in the National Income. Demand for agricultural products is increasing rapidly because of higher rates of population growth and the income effect. Capital is scarce because it is required for industrial development where it gives a high rate of return. Agricultural units are generally of small size because of population pressure. The introduction of labour saving machinery is not generally economical as labour supply is abundant and wage rates are low. The use of selected agriculture inputs, in package form, can increase greatly agricultural production through increasing the efficiency of the agricultural production process. The adaption of these technological changes however

usually requires changes in institutions i.e. credit facilities, marketing, research, the extension service, etc. This phase of development is dynamic so it requires constant evolution and application of technology to provide at a continuing rate of increase in production.

(3) The Modernised Agriculture

This phase of development is characterised by a technology with a large capital component. The focus in this phase includes the continuous application of labor-saving innovations and facilities for producing, distribution and servicing, so that a continuing rate of increase in labour productivity is possible.

The peculiar conditions of agriculture in most of the developing countries in transitional phase is that many of the inputs required for increasing production are present in large quantities relative to other complementary resources. The abundant resources are being used in such large quantities that they lead to low marginal productivities. This category of resources includes labor, land and traditional capital. The latter two are normally thought of as scarce, but according to this

analysis they are relatively abundant.

The scarce resources are of five main types. These are :

(1) institutions to provide maximum incentives including the changes in the land tenure system;

(2) research to develop improved production possibilities;

(3) production faciltities for physical-inputs of new and improved forms;

(4) institutions to supply agricultural inputs and to service agricultural production; and finally

(5) education to help farmers make choices.

The greater use of the abundant resources gives very low marginal returns. However, the increased use of scarce resources results in a substantial increase in production. Therefore, in any area the first step should be to determine which resources are abundant and are being underutilised due to scarcity of complementary resources. The second step is to find a combination of resources yielding higher returns subject to the physical, cultural and economic factors of the area. Few general recommendations made on the basis of average conditions can be of economic use in different areas because these usually do not represent the best combination. This analysis emphasizes

the need for institutions which would be able to make the analysis and provide the necessary information to the farming communities. In this analysis an effective Extension Service is pointed out as a scarce resources with potentially very high marginal returns.

There are three main roles and objectives which the Extension Service has to perform in the development of agriculture: There are : (a) convincing the farmers about the profitability of using off-farm inputs and services in raising farm productivity especially during the early stages of agricultural development; (b) Disseminating tested research results to farmers and bringing back farmers' problem to researchers for solution. In order to perform these functions efficiently extension agents must fully understand the technology they are going to recommend, which implies continuous training of extension workers; (c) Training farmers in making profitable decisions in the selection of technological innovation depending upon the conditions of their farms.

B. Organizational Issues in the Transitional Phase.

Mellor while considering the organizational structure of the extension education, he raises three major issues in organizing the service.

These issues relate to local leadership and control and contact with sources of information and multipurpose versus single purpose programs.

(1) Local Leadership and Control

Due to variability in the quality of agricultural resources and the economic and institutional enviornment, Mellor focuses on the importance of leadership and control in an Extension Organization. The centralised form of organization is not likely to serve efficiently due to its lack of knowledge of local problems and conditions. Thus the operations of the extension service usually need to be modified according to area of emphasis, the level of training of agents, etc., which suit the local conditions and the local patterns. One approach to assure better adaptation to local conditions is to have a local committee of farmers, either elected democratically or appointed by the government. The committee may become an advisory body to the head of the extension organization. In some cases it may even control hiring and paying of the Staff. In any situation the type of relation between the advisory committee and the extension organization will of course, be determined by the culture of the

society, by the existing government structure and by the nature of the extension organization.

This system seems to be suitable for communities which have well organised groups or associations, have high general educational level and depend upon the nature of political structure, i.e. democracy etc. At present in West Pakistan the farmers have no well organized association or group. The literacy is only 16.3 percent of the total population representing five years and above, with rural literacy of only 10.9 percent. Therefore, this type of structure may not favourably suit the existing conditions in West Pakistan of this time. However, the participation of local leadership under Basic Democracy System, in the development programs of the area is being encouraged andaappreciated at all the four tiers of the system. Over a period of time as the local leaders gain more experience in the implementation of development programs and in the organizational matters, it may be possible to adopt a set up of this type on regional basis suited to local conditions in West Pakistan.

(2) Multipurpose versus single purpose units.

Dynamic and progressive agriculture in the transitional phase demands wide variety of services, mar-

keting of produce, storage, servicing, repairing, advisory services, etc. Many of which are complementary in the production process. Under some circumstances effective coordination of all services may be accomplished by having the Extension Service take the place of many different institutions. In this way all the various operating services are under the control of one administrative unit. Such an organization may be in a better position to supply both the technology and credit, which are often complementary. In such an organization credit is supplied with assurance that the technology is there. The new technology is assured that credit will accompanying it. Fuller use of the trained manpower may thus occur. However, conflicts of objectives, and operation in such an organization may result in less efficiencies, because of multifarious nature of the activities to be performed by a single agency. Another difficulty will be that the farmers may be hesitant to deal with an organization, which is working as an advisory agencies and at the same time performing the functions concerning with collection of outstanding dues and amount due as interest. This type of arrangement also raises the

danger to perform extension worker may not have time to perform extension functions being overburdened with a variety of other functions.

(3) Contact with sources of Information.

A fundamental function of Extension Service is to provide a flow of technical knowledge to farmers. To do so the Extension Service must have close contact with research. The ideal situation for both Extension and Research Services is to be located in the same place. One extreme, under this type of arrangement is that Extension and Research be placed under the same administrative control at a Research Station located in the same area as was the case in Japan before World War II (26 :p 359). The other extreme is for both services to be entirely separate. This is often the case in developing countries. In some countries such as the United States, universities provide both the service of Extension and Research. A brief description of the organization set up of the United States is given in the appendix 1.

For better analysis of these alternatives organizational arrangements it is appropriate to review briefly the steps in research that need to be carried out before a new technology is recommended

to farmers. This will help in delineating the functions which must be performed by the research and extension services, and help us better understand how to coordinate their roles. This review will also help us understand that it is not only research in the agricultural sciences which is required but also that research in the biological, behavioral and in the economic fields is equally important to the Extension Service.

The natural scientists through their joint efforts are responsible for evaolving new technology for the progressive development of agriculture. Economists have to study the financial feasibility of the adoption of new technology and the work in behavioral sciences will assist the extension worker in formulating the appropriate extension policies for rapid spreading of the technology.

There are three major steps in research. These are (a) the determining of the research needs. This requires that the researcher has close contact with farmers and they have full knowledge of their problems; (b) the second step is concerned with carrying out the research, which includes : (1) the basic research, i.e. development of priciples and concept

which have high transferability. International cooperation may be useful in this stage.

(2) development research is the application of basic research in solving problems; (3) the adaptive research in concerned with testing of technology under local conditions, and lastly, (4) the test demonstration means testing of technology under private farm conditions. This last function of test demonstration is usually left to the Extension Service, but is actually the joint activity of both the services.

(c) The Third and the last step is recommending research results to the farmers on the basis of economic analysis, and the availability of complementary inputs, the marketing structure and the farming conditions of the area.

C. Training of Extension Personnel

Efficiency in the Extension Service demands that extension workers possess through knowledge of the new innovations because they have to convince farmers of their superiority over those already in practice. This implies that extension personnel must have complete knowledge of agricultural production, knowledge of current farming

practices, of new technologies, of supporting sciences which are necessary to understand innovations; for diagonosing failures and for adapting innovations to variable conditions. Besides this technical knowledge, the extension personnel may also need training in how efficiently to communicate the knowledge, also understadning and knowledge of the structure of the society, its customs and beliefs for efficient performance of the assigned functions.

CHAPTER V

CHANGES REQUIRED TO IMPROVE THE PERFORMANCE OF EXTENSION FUNCTIONS

A: Introduction

When reviews Agricultural extension in the perspective of the phase theory of agricultural development, it has of a small role in the traditional phase. This phase is characterized by stagnant technology. The role of the Extension Service becomes very important, however, with the advent of the transitional phase, which requires the continuous application of new technology to farming to sustain the momentum of an agricultural revolution. This implies that the Extension Service must be retained in new and dynamic technology for rendering better advice to farmers.

The material in this chapter will include the summary of the problems faced and the necessary functions required to be performed by the Extension Service brought out in Chapter III and IV. This will be followed by a discussion of major functions requiring change to improve the efficienty of the Extension Service in West Pakistan.

B: Summary of Problems and Functions Required to be performed by the Extension Service.

(1) Problems

The existing service has encountered with problems

like arranging for plant protection material, its transportation, storage, the preparation of the schedule of work, supervision of actual spraying operations, low and ineffective coverage of area and the laying out of model farms limited in number on influential land large farmers' land. Other problems include lack of coordination within the service and among Extension, Research and Educational Institutions, which have complementary relationships in accelerating the rate of development. The Field Assistant usually performs most of the extension functions single handed with little technical support either from his superiors or from the subject matter specialists and the research workers. This shows that in addition to poor coordination there is also a lack of team approach in rendering the assigned advisory functions. There also seems to be a lack of coordination between extension and education as there is found to be no representation of the Department on any of the bodies of the Agri. University, which may be due to strained relations between the two on account of the 1962 separation.

Furthermore the flow of information from the Research to the Extension Service is sporadic, inadequate

and in certain cases incomplete. This is because of the isolated research efforts by various disciplines even at the same Research Institute and also because the research results are usually not verified under farmers's field conditions. Thus the researchers are not well acquainted with farmer's practical problems. The flow of information from Extension to Research Service is also weak because of infrequent contact between the two services.

2. Functions

The phase theory of agricultural development describes Extension Service as one of the five scarce resourdes needed in raising farm productivity in the transitional phase. The Extension Service has been assigned three primary roles in the development process, which are complementary to other resources. The role assigned are : (a) convincing farmers to purchase off-farm inputs for use on farm (b) two-way job between research and farmers in the dissemination of new Technology and (c) training farmers and enabling them to make their own decisions about the package use of inputs. For performing these functions extension workers must be retrained in the new technology and should have close contact

with sources of information i.e. research, education and other complementary input supplying agencies.

C. Important Extension Functions and Policies Requiring Change.

The extension functions and policies needing change are classified into five main categories and these are :-

1. Reduction in activities currently having low returns.

(i) Major Plant Protection Operations

The plant protection measures, consuming more than half of the total time ofn3,000 Field Assistants, and which are not even being performed effectively. The onepossible alternative is to hand over this activity to theprivate sectorn Because the useful introductory purposehhad been served by the Extension Service and farmers have started taking interest, as they haveggained some experience. This will relieve the Field Assistants, constituting eighty percent of the staff strength, to devote themselves fully to extension responsibilitiesw. This transfer has also been suggested by Dr. Mendivil, Plant Protection Advisor.

He says :

"There exists today a favourable atmosphere for handling the plant protection service over the private sector. Technicians, economists and agricultural authorities concerned seem largely to agree on this objective. I sincerely believe that this is the only practical alternative"(28:p.15)

This transfer has also been recommended in the Third Plan (1965-70) (15:p.406)

(ii) Marketing and Storage

The procurement, transport, storage and distribution of plant protection materials may be assigned to the Agricultural Development Corporation, which already has these responsibilities in respect to fertilizer, seed, improved implements and machinery. With this arrangement it will still be possible for the Department to have some control on checking of quality and of acquiring the required quantities of material and equipment in dealing with emergencies like locust invosions, etc. This will keep the Extension Service away from all these commercial activities and thus it will be in a better position to perform the advisory job.

2. Improved Test Demonstrations on Farmer's Fields

Establishing a limited number of model farms at

some influential farmers' land according to Dr. Svinth may not be fully utilizing the scaree resources i.e. the Extension Service. In order to make full use of this resource, it is suggested that the model farms may be established in each village. In this way it would be possible to disseminate new technology amongst a larger number of farmers. For successful demonstration, the team approach is also essential. Therefore, the laying of these farms may be undertaken jointly by the District Chief, Subject Matter Specialists, Research Workers, Agricultural Assistants and the Field Assistants. Other farmers may be invited to see the standing crop and discuss its production methods and results with the Extension Staff and Research Officials. Holdings of "Harvest Days" may also be announced at the time of laying out of these farms. Cash prizes and certificates may be awarded to farmers producing highest yield per acre at all levels for encouragements.

3. <u>Improvement in the Flow of Technical Information.</u>

The flow of technical information can be imp-

roved by strenthening the linkage with sources of information. The sources are Research Service, Educational Institutions, Agricultural Information Service, and other agencies dealing with supply of inputs. The suggestions for improvement will be dealth with under the following sub-headings:

(i) Administrative Changes

In order to strengthen relations between Research, Extension and Education Services, the one possible measure may be that the Advisor to the Secretary of Agriculture be given the responsibilities of coordinating the activities of Research, Extension and Training Intitutions, with administrative control reminging with Regional Heads. To assist the Agriculture Advisor, two senior officers - one from Research andthe other from Extension, may be appointedn in his office at the Provincial Headquarters. It will relieve some of the administrative burden of the Advisor.

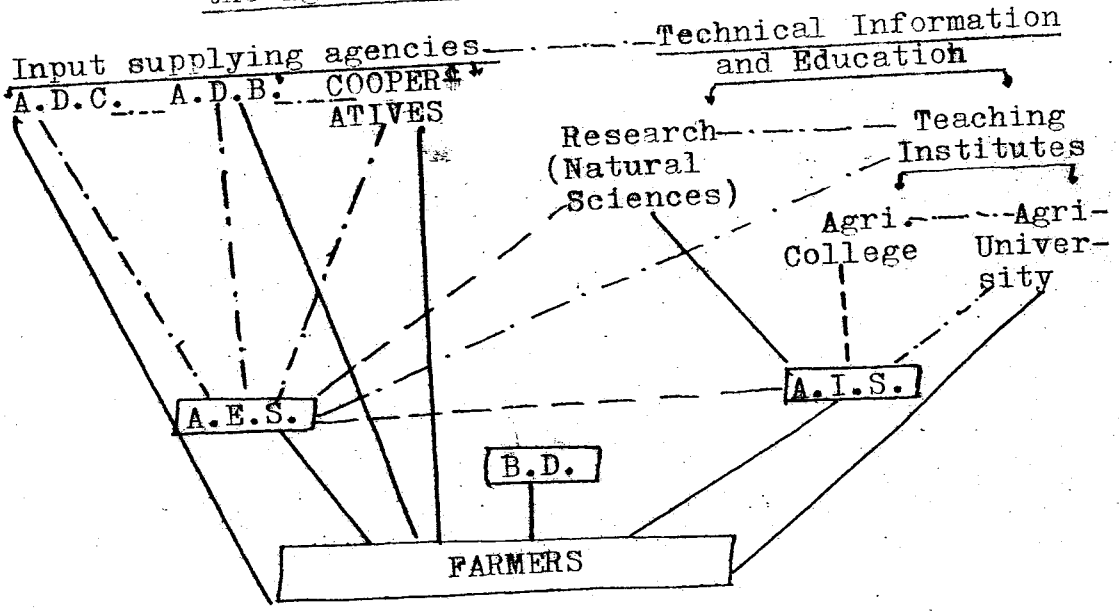
To improve relations with the University, the Agricultural Advisor may represent the Department on the Board of Syndicate or the Academic Council and the two of his (Advisor) Assistants represent

the Department of other bodies like the Committee for Advanced Studies and for research of the University. This will help in preparing coordinated research and educational policies and plans and also in preparation of in-service training and short courses programmes according to the requirements of the Extension and Research Service. This arrangement will also provide better information to the Extension Service about the results of research, not only of natural seiences but also of economic and social research conducted both by the Research Institutes and the University respectively.

The coordination within the Extension Services may be improved by reducing the administrative and Office work of the District Chief by providing him with an Assistant for the purpose. This arrangement will enable the District Chief to provide better guidance and supervision to the subordinate staff.

The figure of page 83 shows that there exists fairly strong enough relationship among the extension service, farmers and the Basic Democracy system and

Fig 3 Existing and Proposed Linkage System for the Agricultural Extension Services.



References:

Strong Linkage } Existing relationship

Weak Linkage }

-.-.-.-.-.-.-. Linkage needed

A.D.C. Agricultural Development Corporation: Supplier of seed, fertilizers, agri. machinery on rental basis.

A.D.B. Agricultural Development: Credit needs, agricultural machinery on credit basis.

A.I.S. Agricultural Information Service.

A.E.S. Agricultural Extension Service

B.D. Basic Democracies.

and also between information service, research, farmers and the Basic Democracy Systems. The relationship between inputs supplying agencies and the sources of technical information and the extension service are either weak or almost non-existing. This later linkage system is a must to attain and to maintain the progressive rate of development in agriculture and thus need improvement.

(ii) Improved Annual and Crop Season Activity Plans.

The Extension Service presently prepares its annual crop season plans. These are mostly prepared at the Regional level and targets are fixed and annual review of the programme is also done. It is suggested that while preparing these plans Regional Heads of other concerned agencies i.e. Research, Cooperative, Information Service, Agricultural Development Corporation, Agricultural University, Agricultural Machinery Organization, Agricultural Development Bank, Irrigation, Basic Democrats, etc., may also be invited, so that a coordinated regional plan keeping in view the targets set in National Plans may be prepared and followed by each. These agreed programmes then may be explained and circulated amongst the staff members of these depar-

tments and efforts be directed to achieve the goals set in these plans. Periodic reviews of these programmes may also be undertaken to ensure better performance.

(iii) Increase in number of Subject matter of Specialists.

For better supervision in extension work the number of subject matter specialists may be increased, especially at the District Level according to the needs of the area. They may be on the extension staff or on the Research Staff, but the essential factor is that they must have close contact with research and participate in certain phases of research to keep abreast of their profression. The other suggestion is that they should regularly visit field workers on the spot and render them necessary assistance in solving the problems. They are also responsible for preparing suitable and required literature in their respective fields for use by the extension workers.

(iv) Physical Proximity of Technical Personnel in Operating Areas.

Under this heading it is suggested that if possible, the national building departments and

agencies especially Agriculture, Agricultural Development Bank, Agricultural Development Corporation, Irrigation, Agricultural Machinery Organization, Water and Power Department Authority, etc., may have their regional, and sub-regional and lowelevel offices close to each other and near the public dealing Offices like courts, post offices so that the farmers do not have to run from Office to Office for acquiring necessary information needed in the transitional phase of the development process. This will facilitate the operation of the Extension Service on account of the close proximity of other agencies dealing with the development.

Facilities like transport, residential and Office accommodations and place for holding meetings may also be provided to the Extension Service. These facilities will improve the efficiency of the Extension Workers.

This is being done under the Comilla Approach as the Thana Training Centre is a collection of physical facilities (offices, classrooms, quarters, bank, workshop, etc.)., where the Thana level officers of the National - Building Departments and semi- autonomous agencies live and work. This arrangement pro-

vides for a continuing contact between the officers and the leaders from the villages. This system makes good use of the officers time as they, through this indirect way of working through the village leaders as extension agents in the villages, can approach a greater number of people.

(v) Improved Flow of Information back to researchers.

In order to improve the flow back of information to researchers it is suggested that research specialists may be invited to attend annual and Crop Season Meetings of the Extension Service by utilising their help in laying out of demonstration plots, by arranging discussions with farmers and by testing of research results on farmers' land. In this way the research workers will be able to better understand the practical field problems of the farmers and this in turn may help in shifting the present theoretical trend of research toward the applied side.

4. Changes to Improve the Quality of Extension Personnel.

The discussion under this heading will focus on the training of extensional personnel, possibilities of improving the level of eduation, increase

in pay, service status and promotional procedures.

(i) Education and Training

The efficient operation of the Extension Service depends upon the quality of trainimng of the personnel. As discussed earlier, the majority of the graduate staff got their training in one of the three colleges-Tandojam, Peshawar and Lyallpur (now the Agricultural University). Mostly they were trained in the natural sciences while majoring in agriculture, with little practical field training and non-training in Agricultural Extension, Communication and Social Sciences. However, the West Pakistan Agricultural University has now started courses in Extension Education and Methodology, Rural Sociology and Communication, thus better trained graduates will now be available to the Extension Service. It is suggested that the Agricultural Colleges may also start offering courses in these subjects, with greater emphasis on the practical side, if such subjects are not being offered by them. In this way better equipped graduates will be available to the Extension Service.

The Field Assistants have after Matriculation one-year pre-service training in agriculture, with

little practical field work. The government has recently dedided to extend this period to two years at all the five Training Institutes with greater emphasis on field work. It is further suggested that the faculties of these Institutes may also be strengthened both in quality and size. The faculty may include members tra ned in Extension Methodelotv, ology, Farm Management, Irrigation Specialists, Machinery man, etc., in addition to other staff trained in the natural and social sciences.

The Extension Service to be fully effective needs periodical refresher courses and in-service training to equip personnel with new developments and skills. It can beachieved by various ways. Some of these are :

One alternative is on-the-spot training of field workers by supervisors or subject matter specialists. The other alternative is to hold group meetings such as a conference, a workshop - an educational technique which involves group participation in the consideration of problems and the determination of suitable solutions, or a seminar for one day or even for one or more weeks. Such group meetings should be held as frequently as

necessary, so that new ideas and new techniques can be adopted by the service.

The third alternative suiting the existing conditions of the Extension Service is retraining of the whole force through in-service training programs. This can be possible through two steps :

First, the efficient and hard-working staff members at all levels may be encouraged in improving their education, by granting them study leave. It may be that some of these, due to financial or other reasons, could not pursue their studies further. So this sort of concession will serve as an incentive to capable and efficient workers to prove their worth by acquiring higher education.

Second, Field Assistants who had one year training and other staff members who had been trained in any of the three colleges, may be sent in batches of may twenty persons or so to the Agricultural University. This is because the University has facilities for short training courses, instead of waiting for the establishment of

Department's own In-service Training Institutes at the three Research Institutes. The Department Institutes may be established depending upon the availability of funds and technicalsmanpower needed to man these Institutes. In addition this arrangement may assist in cementing the relationship between University and the Department. The Services of research specialists of Research Institutes may be utilised by inviting them to give special lectures. The trained personnel of each region may be reposted in group say in one union or Tehsil so that they can utilize what they had learned during the training.

(ii) Pay, Promotions and Posting

The cases of promotion and pay increase may not be wholly decided on seniority basis as is the usual procedure, but due consideration may be given to sincerety and devotion to hard work. On promotion, if possible, one may be allowed to work in the same area, in the same project, so that one can pursue one's plans further.

Under the existing conditions the Field Assistants have no chance of getting promotion, as there is no post to which they can be promoted. In order

to provide an incentive to efficient Field Assistants, possibilities of creation of a new post may be given due consideration.

The upgrading of the status of posts in Extension and bringing them up at par to other departmental posts of equal level seems to be another measure to improve the situation.

Another factor though of administration, which has its bearing on the efficiency of the Extension Service, concerns the tenure of stay at one place. As stated earlier, the average tenure of stay is generally short (may be in months) on account of too frequent transfers, whereas the average tenure of stay of an agricultural sgent in the United States is well over ten years. The usual policy of transfering after every two or three years or so needs a realistic consideration. This time period seems to be necessary for an extension worker to acquaint himself with local conditions and with the people of the area. Furthermore it may not be possible even to judge fairly well the achievement of a worker during this period, especially of long range development work and thus too quick transfers may slow down the tempo of

development, which needs continuous and constant persuation of progressive development.

5. Improvements in Education Function of the Extension Service.

(i) Training Rural Leaders

Rural leaders are one of the most potent vehicles for the communication of new information, knowledge and skills to the fellow neighbouring farmers. There should, therefore, be a regular program of training rural leaders. Their training may include both general information, knowledge concerning the important matters and training in specialised subjects, This may also include visits to sucessful projects and programs. While selecting farmers for the training, age factor may be kept in view and as far as possible farmers of the same age group should be selected for the training.

The training camps should be near the residences of the trainees, most preferably at the Union headquarters as they would not like to travel long distances and leaving their homes for a long period. Onthe same ground the duration of the course may also be as short as possible and a few subjects be included at one time. These meetings may be arranged

during such time that it may not come in conflict with the time schedule of the farmers. Follow-up of the trainees is equally important. Thus after the leaders have gone through the training, they must be provided with help and guidance whenever they need and finally their contribution to the projects be evaluated periodically. This would also make possible an evaluation of the effectiveness of the training program.

(ii) The Comilla Approach

The Comilla appraoch considers the village as an organic unit for economic planning and development. The main emphasis of the whole approach is to train rural leaders as extension agents in the village and thus to dispense with the departmental representative at the village level. Some of the basic principles of the appraach are:[1]

a. A group appraoch through villagegroup is essential.

b. Creation of a multiplier effect in the agricultural extension work using organizers, model farmers, etc., as extension agents in the village.

---

1. "The Mymensingh, The Comilla, and The Indian Package Program Appraoch in Agricultural Extension" by Oddvar Aresvik May, 1964 - "Unpublished Paper".

c. Weekly continuous and massive training of the selected "extension agents" from the villages.

d. Weekly village meetings, whereby the things taught to the village extension agents will be transmitted to fellow village farmers.

e. Training and development centre at Thana level is a must.

f. The villge must be reorganised socially and economically and the responsibility for local development be rested with the villagers themselves.

g. Local authority is imperative. The Thana training and Development Centre must operate autonomously.

h. The (government) officers become teachers, trainers and salesmen to spread the technique of progress among villagers.

i. Each village must select its own leaders. The paid village level workers can be dispensed with.

j. Village network of primary cooperatives supported by a strong nucleus for promoting various activities and should become centres of social power.

k. Development of physical infra-structure, i.e. roads, drainage, irrigation, etc., through the Thana and Union Councils under Rural Works Program be taken up.

l. Thana Council, the coordinating agency of the various departments' programms for rural development.

Applicability of these priciples under West Pakistan conditions may be investigated while working out the the training programs for rural leaders.

(iii) Examples from Agricultural Development Corporation (ADC) and Salinity Control and Reclamation Project (SCARP) Areas.

The Corporation (A.D.C.) has established five of the ten Training Centres for the training of young farmers, mostly farmer's sons, who have three to six years of schooling. The duration of the course is one year with emphasis on practical field training. Each centre for this purpose has 100 acres farm. In this way the corporation is working on a long range policy of creating trained future farmer community in the area under its command.

The SCARP's service has the advantage of the team appraoch as at the begining of each seasnn extension workers are trained in extension techniques and work plans are prepared. The instructional material prepared by the Research and Information Service is discussed in staff meetings and also distributed amongst the farmers for their guidance. After the training the team consisting of district agricultural officer, Agricultural Assistant and the Field Assistant work jointly in the field in laying out of demonstration plots.

The SCARP Service is concentrating all its

efforts on five crops - wheat, rice, sugarcane, cotton and maize. The involvement of Basic Democrats in the developmental activities, by seeking their help in selecting demonstration farmers, forming voluntary crop committees, in helping extension service in their work in introducing improved techniques are the other specail features of the service. The demonstrators are then requested to train ten other farmers in using new methods of farming next season.

By following this policy the SCARP Service has been able to almost double the yield per acre of wheat as stated by Dr. Svinth in his report. (35: p 27)

CHPATER VI

SUMMARY AND CONCLUSIONS

Since Indendence in 1947 various steps have been taken to strengthen the Agricultural Extension Service in order to accelerate the rate of development in agriculture. Total Staff was increased from 1,727 workers in 1959-60 to over 3,800 personnel in 1965. Several changes were made in the organization of the Service. These include the establishment of three Regional Directorates instead of the former single Directorate to cater to the needs of the different parts of the Province. Extension work along with staff was transferred in some specified areas to the Agricultural Development Corporation and to a new body, the Land and Water Development Board, in order todeal with the specific problems of the areas. Some of the commercial activities - procurement, supply, storage and distribution of inputs have been handed over to A.D.C.

The analysis of the Second Plan (1960-65) performances, carried out by the Planning Commission stated that the Agricultural Extension Service played only a small role in increasing agricultural production. The major share of the increase was

assigned to fertilizer and irrigation.

This study analyzed the working of the existing Agricultural Extension Service, including the education and training of the personnel employed in the Service. Ways and means to improve the effectiveness of the Extension Service have been suggested in this study. The problems analysed and the measures suggested for each are summarised below :

1. Reduction in Low Return Activities

The activities included in this category are : a) plant protection operations, which are consuming more than half of the time of eighty percent of the staff and are generally not being performed effectively; and b) procurement, transportation and storage of plant protection material.

Among the measures suggested are transfering of plant protection operations i.e. supply, distribution, spraying etc., to farmer and the handing over of commercial activities relating to acquiring of plant protection material especially from other countries to the Agricultural Development Corporation and/or the private sector.

2. Improved Test Demonstration

Under the existing circumstances the Extension

Service is heavily concentrating its efforts on a few model farms which according to Dr, Svinth no Extension Service in the world can afford.

In order to disseminate knowl dge among larger number of farmers, it is advisable to established a large number of model farms, possible in every village. This will assist in better utilization of the scarce resources, i.e. the Extension Service. It is further suggested that the Extension Service should hold "Harvest Days" and award cash prizes and certificates to the best proddcersfor encouragement.

3. Improvement in the Flow of Technical Information.

The Extension Service is a two way channel between the farmers and the Research Service. Some obstacles were found like the lack of coordination (a) within the Extension Service, (b) between Extension, Research and Educational Institutions and (c) with other supporting and complementary agencies dealing in the supply of inputs.

The possible measures for improving the situation are (a) Agriculture Advisor, with the help of

his two assistants, may be assigned the job of coordination of activities of Research, Extension and Training Institute; (b) Agricultural University may have Extension Service representative on its various bodies - Board of Syndicate, Academic Council etc.; (c) the provision of an additional hand to District Agricultural Chief to deal with administrative and office work; and (d) Agricultural Colleges and University may invite specialists from Research and other Teaching Institutes for special lectures and seminars. The same procedure may be followed by the two colleges.

Other possible measures are preparing joint coordinated annual programs. The laying out of demonstration plots jointly by Research and Extension Officers and increasing the number of subject matter specialists at the District level. Nation building Department and agencies should have their regional and other sub-regional offices close to each other. Extension personnel do need more facilities like transport, office and residential accommodation and places for holding meetings. These will assist in increasing the efficiency of the Service.

4. Changes to Improve the Quality of Extension Personnel.

The difficulties encountered are - inadequately trained staff, lack of inservice training facilities relatively low status of posts in the Agricultural Department, short tenure of stay in one location, lack of promotional opportunities for Field Assistant and promotion mostly on seniority.

The measures suggested are the starting of courses in Extension Education and Methodology, Communication and other Social Sciences; more emphasis on practical field work; improving both the quality and size of the faculty of Training Institute for sub-professional field workers; starting in-service training courses for all ranks by utilizing services of the Department of Short Courses of the Agricultural University; granting study leave for acquiring higher education; up grading of the status of posts in Agriculture Department; and the creation of a new suitable post for meritorious Field Assistants thereby avoiding too quick transfer of extension workers.

5. Improvement in the Educational Functions of the Extension Service.

Rural leaders have been proved the quickest

and most rapid means of spreading new technology. Under the existing circumstances, this fact hasnot not gotten the full attention of the Service.

In order to utilize these leaders it is recommended that progressive and poineer farmers from each village be selected. These demonstrators then should be trained in the new technology by holding short duration simple courses near their homes. This approach has proved successful under the Comilla approach in East Pakistan, and also in SCARP areas and in areas under the command of the Agricultural Development Corporation.

BIBLIOGRAPHY

1. Ahmed, Kazi. S. — A Geography of Pakistan, Oxford University Press, Karachi, 1966

2. Akhtar, S.M. — Economics of Pakistan United Ltd, 1965

3. Elkenton, Charles, and Aziz Sayeed — Agriculture in Pakistan, Pakistan Agriculture Resources Progress and Prospects, 1966.

4. Fay, Ivan G. — Notes on Extension in Agriculture, Asia Publishing House, New York, 1962.

5. Ferguson, Ben R. — U.S./AID. Pakistan Technical Report Agriculture Extension Mymensingh District, East Pakistan, July, 1963.

6. Food and Agricultural Organization of the United Nations, Production Yearbook, 1965.

7. Chang, C.W. — Increasing Food Production through Education Research and Extension, 1962, Freedom from hunger campaign, Basic Study No.9

8. Laidlan, Alexander, F. — Training and Extension in the Cooperative Movement, 1962 Agriculture Development Paper No.74, F.A.O., Rome.

9. Yang, W.Y. — Farm Development in Japan, 1963 Agriculture Development Paper, No. 74., F.A.O. Rome.

10. Government of Pakistan, Ministry of Agriculture, Agriculture in Pakistan, 1959.

11. Government of Pakistan, Ministry of Food and Agriculture, Report of the Food and Agriculture Commission, '60.

12. Government of Pakistan, Ministry of Education, Report of the Commission on National Education, 1959

13. Government of Pakistan, National Planning Board, The First Five Year Plan, 1955-60, 1957

14. Government of Pakistan, Planning Commission, The Second Five Year Plan, 1960-65, 1960.

15. Government of Pakistan, Planning Commission, The Third Five Year Plan, 1965-70, 1965

16. Government of Pakistan, Planning Commission, Agriculture and Food Section, Handbook of Agricultural Statistics, 1964.

17. Government of Pakistan, Planning Commission, Evaluation of the Second Five Year Plan, 1960-65, 1966.

18. Government of Pakistan, Department of Films and Publications, Basic Democracies Functions and Achievements, 1966

19. Government of Pakistan, Ministry of Food and Agriculture, The Commissioner, Pakistan Agricultural Census, Preliminary Report, Agricultural Census West Pakistan, 1961

20. Government of West Pakistan, Planning and Development, Deptt Bureau of Statistics, Statistical Handbook of WestnPakistan, 1965.

21. Government of Pakistan, Agricultural Department, Agriculture and Rural life in Mymensingh.

22. Hunting Technical Services Limited, Programme for the Development of Agriculture in West Pakistan, May 1966.

23. Kelsey, Lincoln David and Chiles Hearne Cannon — Cooperative Extension Work, Third Edition, 1963, Constock Publishing Associates, Cornell.

24. Krishan, Ram. — Agricultural Demonstration and Extension Communication, Asia Publishing House, London, 1965.

25. Leagans, J. Paul — India's Experience with Training in Extension Education for Community Development, Comparative Extension Publication Number 5, New York State College of Agriculture at Cornell University, 1961

26. Mellor, John W. — The Economics of Agricultural Development, Cornell University Press, 1966.

27. Mosher, A.T. — Varieties of Extension Education and Community Development, Comparative Extention Publication Number 2, New York State College of Agriculture at Cornell University, 1958.

28. Mendivil, Francisco Paechico — Plant Protection: Recommendations for improving the effectiveness of Plant Protection Research and Field Application in West Pakistan, Report No.5, Accelerated Crop Improvement Reports, Planning Department, West Pakistan, October, 1960.

29. Narvaez, Ignacio and Borlaug, Norman E. — Progress Report Accelerated Wheat Improvement in West Pakistan, and the Revolution in Agriculture, West Pakistan Planning Department, March, 1966.

30. Odon, W.H. — Recommendations for an Accelerated Jowar Improvement Programme in West Pakistan, West Pakistan Planning Department, October, 1966

31. Qureshi, S.A. Annual Technical Report, Accelerated Wheat Improvement Programme West Pakistan 1965-66, August, 1966

32, Report of a Working Party of European Experts, Agricultural Extension Services in the U.S.A., Published by the Organization for European Economic Cooperation, Paris, 1951

33. Pakistan Academy for Rural Development, Comilla, The Comilla Rural Administration Experiment History and Annual Report 1962-63 - An Evaluation of the Rural Public Works Programme, East Pakistan, 1962-63

34. Schikele Rainer. Farm Management Research for Planning Agricultural Development, Agricultural Development Council, New York, 1966.

35. Svinth,C.A. Strengthening Agricultural Extension in West Pakistan,1965-70 West Pakistan Planning Department August, 1966.

36. Waddle William M Recommendations for an Accelerated Cotton Improvement Programme in West Pakistan, West Pakistan, Planning Department,October,1966

37. West Pakistan Agricultural University, Lyallpur, Fourth Year,1965

38. Wilson,John R Technical Report Agriculture, USAID Pakistan, May, 1965

39. Some Important Concepts of the Process of Expanding Agricultural Production considered in light of Recent Pakistan Experience, (M. S. Thesis - 1965)

APPENDIX - A

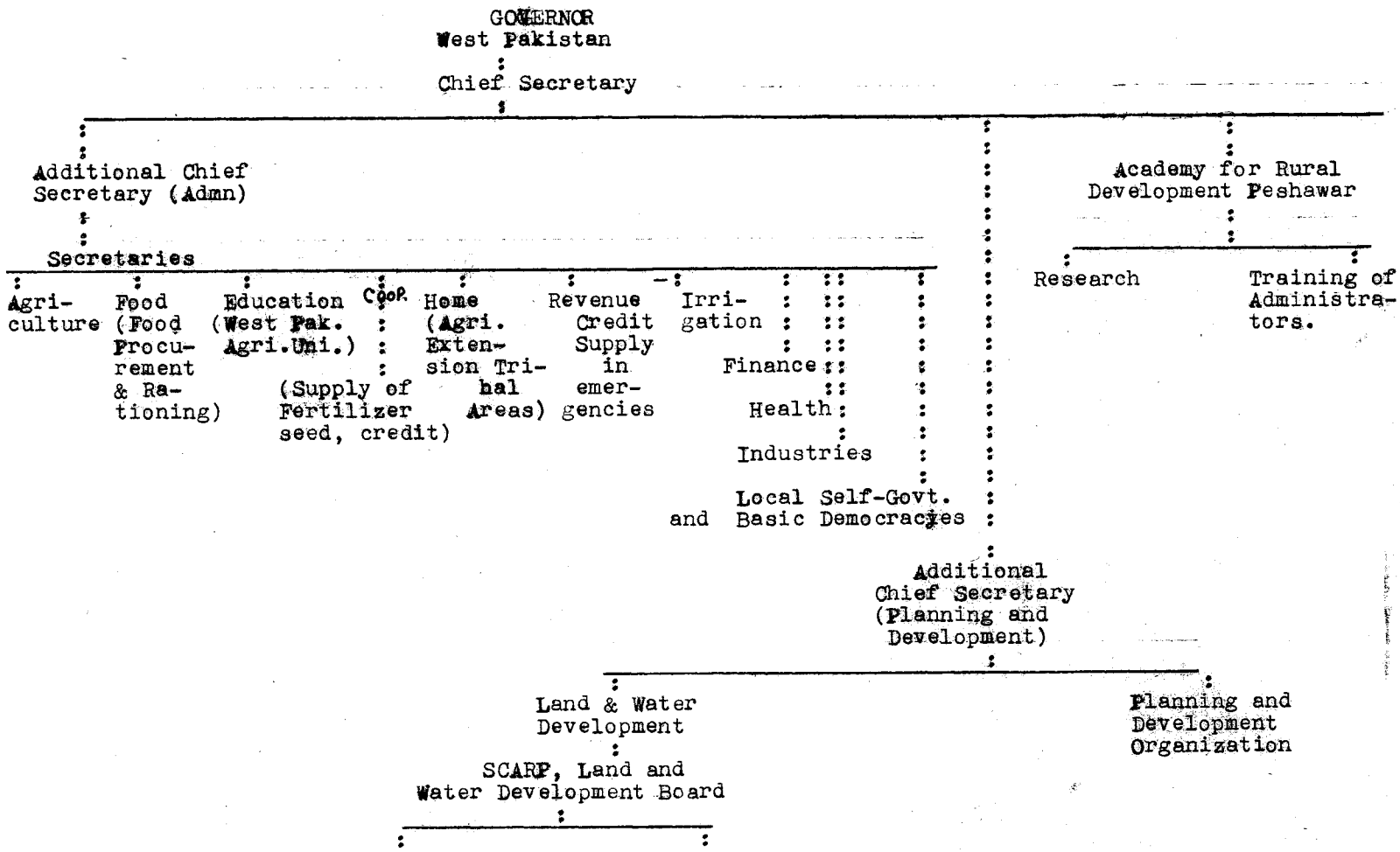
Monthly Mean Maximum and Minimum Temperature at Selected Centre, West Pakistan, (Farenheit)

	Peshawar		Murree		Rawalpindi		Lahore		Multan		Quetta		Hyderabad		Karachi	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
Jan.	68.0	40.4	45.2	30.7	62.3	37.9	68.0	40.1	68.0	42.0	50.2	27.6	75.8	50.6	75.5	57.4
Feb.	66.2	44.0	46.7	31.1	65.2	41.7	72.1	44.5	72.8	46.8	53.6	30.8	81.2	54.5	76.9	61.0
March	74.8	52.4	51.6	37.8	75.1	50.4	82.6	53.2	83.9	57.2	63.6	38.3	92.5	63.8	81.8	68.1
April	85.2	60.5	65.3	46.9	86.2	59.3	94.5	63.2	95.3	67.5	74.0	45.8	101.8	71.9	85.4	74.2
May	97.0	70.4	75.1	55.6	97.7	68.7	103.7	72.2	104.8	77.4	83.8	51.9	107.0	78.2	88.6	79.0
June	105.0	77.2	80.7	60.5	103.5	75.9	105.9	79.0	106.6	84.8	91.6	58.7	104.5	82.0	90.4	82.3
July	102.5	80.2	76.2	58.9	97.8	77.1	99.6	80.1	102.4	85.5	94.0	65.0	99.3	81.4	88.5	81.1
Aug.	98.2	78.9	73.2	57.4	93.7	75.5	97.0	78.7	98.9	82.9	92.2	61.6	95.8	79.2	85.8	78.5
Sept.	95.0	71.8	72.3	54.8	93.4	69.3	97.3	73.1	98.7	77.7	86.2	49.7	97.3	76.4	85.6	76.7
Oct.	87.8	60.5	67.6	49.3	88.6	57.0	94.0	59.8	94.4	63.7	75.7	38.9	97.8	70.2	87.3	73.7
Nov.	76.8	48.9	59.5	41.0	77.7	44.4	82.9	47.3	82.9	50.9	65.4	28.1	88.8	58.8	85.2	66.9
Ded.	66.7	40.9	50.7	34.9	66.8	37.8	72.3	40.6	73.7	43.4	55.5	28.5	78.6	52.6	78.7	60.1
Annual Mean	85.0	60.5	64.0	46.6	84.0	57.9	89.2	61.0	90.1	65.0	73.8	44.1	93.4	68.3	84.1	71.6

Source : A Geography of Pakistan, By Kazi S. Ahmed, pp. 186-193.

APPENDIX - B

Administrative set up of the Government of West Pakistan



APPENDIX - C

Organizational set up of the Department of Agriculture

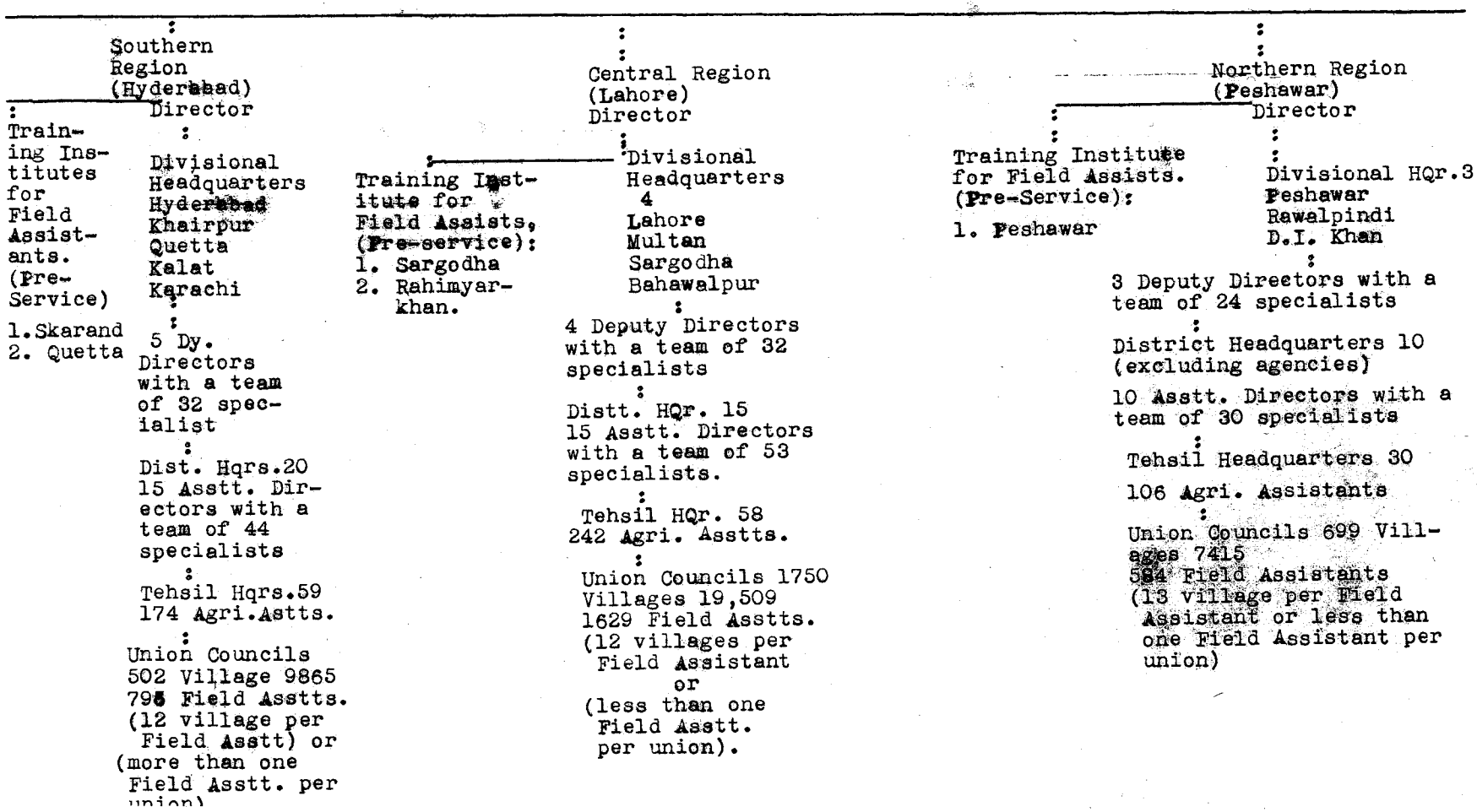
SECRETARY

Agri. Advisor, Agri. Joint Secretary (Three Regions) 1. Southern Region (Hyderabad) 2. Central Region (Lahore) 3. Northern Region (Peshawar)	Animal Husbandry (Advisor Animal Husbandry) (5 regions) 1. Peshawar 2. Lahore 3. Bahawalpur 4. Hyderabad 5. Quetta Kalat	Forestry (Advisor Forestry) 5 regions 1. Peshawar 2. Lahore 3. Bahawalpur 4. Hyderabad 5. Quetta Kalat	Fisheries	Bureau of Agri. Information Service (W.Pak basis) for all organization under Secy. Agriculture	Deputy Director Plant Protection (Locust control in settled areas).	Director Soil Conservation	Director of Agri. Engineering Headquarter (Central Region) Lyallpur.	Director Soil Fertility	Agricultural Development Corporation

* To Give technical advice to the Secretary.

APPENDIX - D

Organizational set up of the Agriculture Department Extension Service



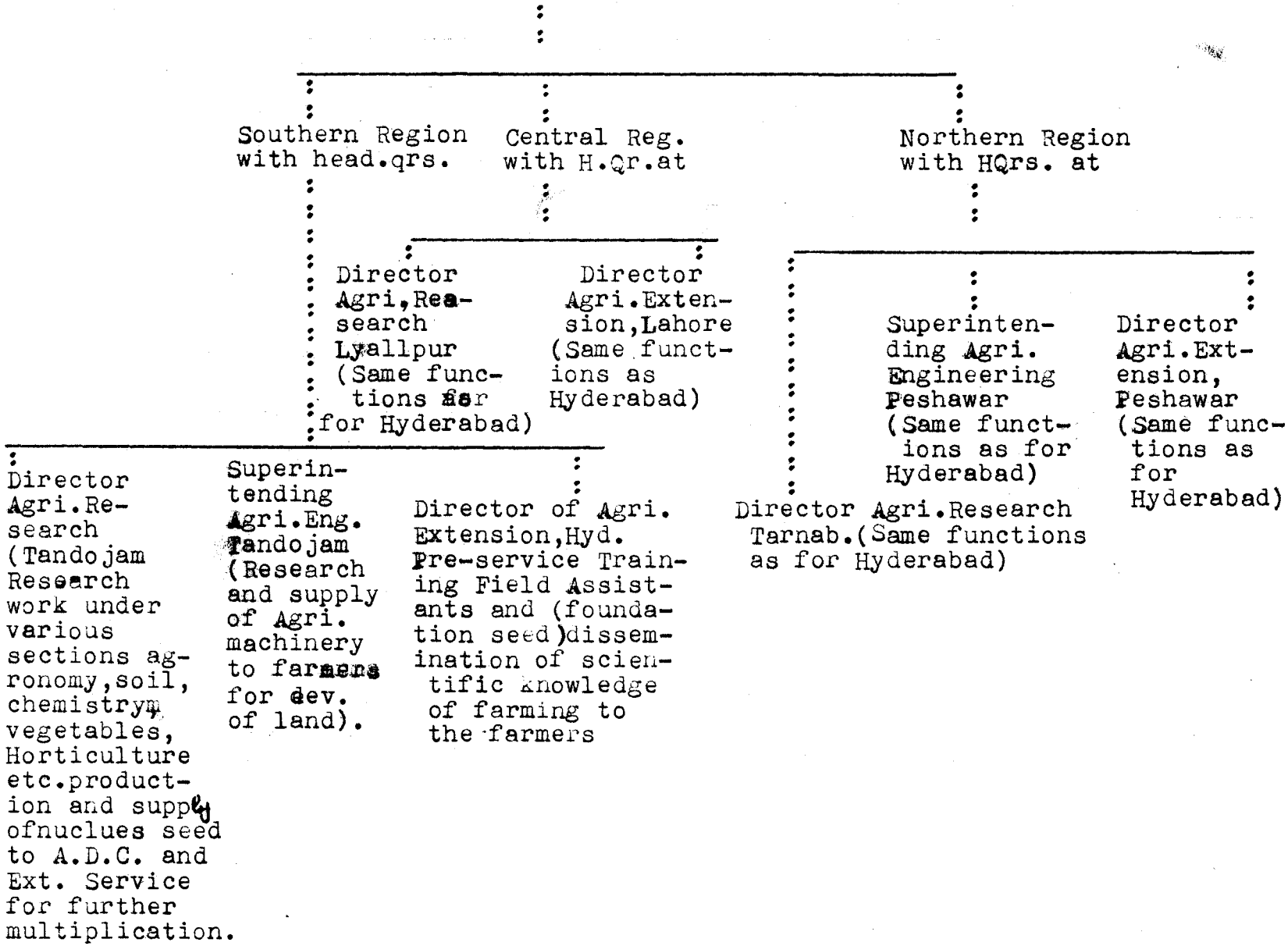
APPENDIX - E

Faculties, Divisions, Institutions and Departments of the West Pakistan Agricultural University, Lyallpur

Faculties					Div. of Basic Science and Arts	Directorate of Advanced Studies and Research	Institute of Teacher Training Extension and short Courses
Agriculture Departments of 1. Soil Science 2. Plant Breeding & Genetics 3. Agronomy 4. Horticulture 5. Entomology 6. Plant Protection Cell 7. University Farms 8. Plant Pathology 9. Forestry and Range Management.	Animal Husbandry Departments of 1. Animal Breeding and Genetics 2. Nutrition 3. Nutrition Cell.	Veterinary Science Departments of 1. Livestock Management 2. Poultry Husbandry 3. Livestock Farms 4. Anatomy 5. Clinical Medicine & Surgery 6. Pathology 7. Microbiology. 8. Parasitology 9. Physiology & Pharmacology	Agri. Eco. and Rural Sociology Departments of 1. Agri. Econ. 2. Farm Management 3. Agri. Marketing 4. Rural Sociology 5. Socio-Eco. Research Project	Agri. Eng. & Technology Deptt. of 1. Basic Engineering 2. Irrigation & Drainage 3. Farm Machinery and Power 4. Food Technology. 5. Fibre Technology.	Deptt. of 1. Botany 2. Zoology 3. Phy. & meteorology 4. Chemistry 5. Mathematics & Stat. 6. Social Sciences and Humanities	Deptt. of 1. Advanced Studies 2. Research	Deptt. of 1. Teacher Training 2. Agricultural Extension 3. Short Courses

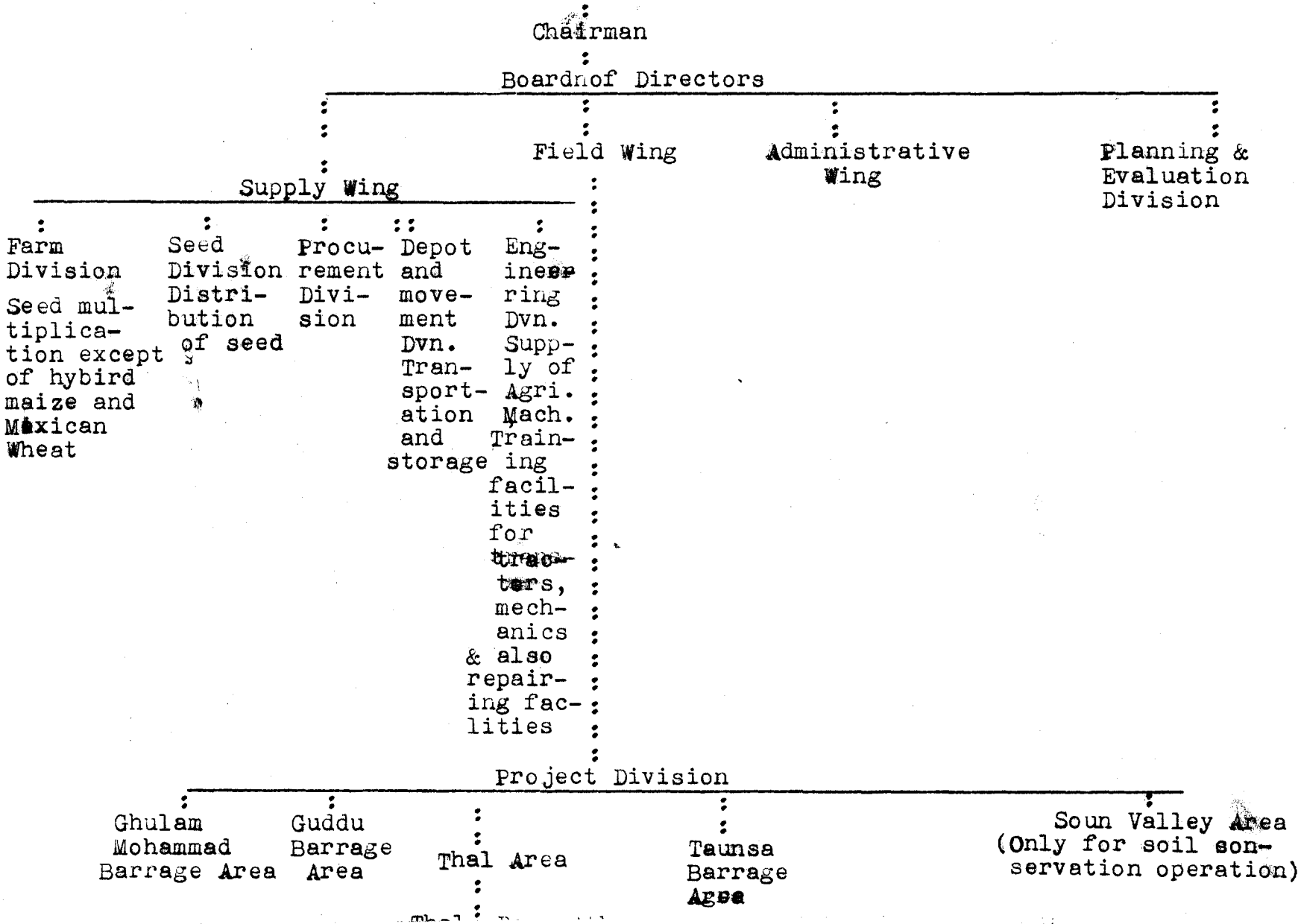
APPENDIX - F

Functions of the Director of Agricultural Extension and Agricultural Research and of Superintending Agricultural Engineering



Appendix - G

Organizational setup of West Pakistan Agricultural Development Corporation



Appendix-H

AGRICULTURAL EXTENSION ORGANIZATION IN TRIBAL AREAS OF WEST PAKISTAN

Secretary Home Department

LAHORE

:

:

Resident Commissioner Tribal Areas

Headquarters - Peshawar

:

:

Director Agri. Deptt. of Agri. Peshawar
Plant Protection Officer
Horticulture Officer
Agri. Engineer
) Advice Supplies of Inputs also.

Deputy Director Agri. (Tribal Areas)

H.Q. Peshawar

:

:

5 Assistant Directors

one for each agency

:

Khyber and Mohmand Agencies (Peshawar)
Khurram Agency (Parachinar)
Malakand Agency (Dargai)
N. Wazirstan (Wana)
S. Waziristan (Miran Shah)

:

:

23 Agri. Assistants

:

:

72 Field Assistants

United States Extension Service System

The Extension system in each State is a department of the College of Agriculture, which is organized and directed by the college and is free of Federal Control except for the provision that careful plans for the expenditure of the money must be drawn up by a State Committee in consultation with experts from the Extension Division of the U.S. Department of Agriculture and be jointly approved. This provision for consultation and approval by the Extension Division of the Federal Department of Agriculture is a good condition. The Federal Department of Agriculture hires experts with broad experience and training who are familiar with the special problems of each State and they also have broad understanding of national extension problems. Their sympathetic and sincere advice is welcomed by the States.

The Land-grant College of Agriculture is each State - on an average - directs the work of the Experimental Station, carries on all teaching in the field of agriculture and the training of agricultural teachers and extension agents and finally directs

the Extension Service in the State. Each state Extension Service is by law - the Smith-Lever Act, 1914 - a part of the land-grant college, of Agriculture.

The President of a Land-Grant College, who is appointed by the Board of Regents, is responisble to his Board of Regents and to the U.S. Department of Agriculture for the conduct of extension work. The appropriation to the Colleges are provided through the State Legislature and by the Federal Department of Agriculture. In every State there is a State Director of Extension who is responsible for the general conduct of extension work in the State. The State Director may be either responsible to the Dean of Agriculture or the President of the College depending on the organizational pattern adopted by the Land-grant College. The State Director of Extension is assisted by District Supervisors, who are responsible for the coordination of the work of all county agents within the area. He frequently attends rural meetings, assists in the initiation of new activities, participates in the in-service train-

ing of the county workers and tries to maintain good relationships with the field workers and other agents.

All States have a staff of subject matter specialists, whose functions are to keep field workers in touch with the latest technical developments, to assist them with special problems, to aid in program development and to carry back the unsolved problems of the farmers to the State research workers. The specialists is the link between the research station, the field agent and the farmer. Thus he himself is neither a research worker doing work in the laboratory nor an extension field worker. His work also includes the preparation of popular bulletins, the in-service training of the field staff and the provision of advice and assistance to the State extension editor on the preparation of news releases and visual aids. He has no administrative or supervisory responsibilities. He is responsible to the Director of Extension for his work, but relies upon his respective subject matter department of the land-grant Colleges for

for his technical information and frequently is housed in the department. Each state has also an information service unit to provide visual aids, radionand press releases, etc. Some States also have a special advisory committee at the State level to cooperate with the State extension service in its planning of programs. Most of the States, however, have a State Council of home demonstration clubs comprising representatives from the various county home demonstration councils, which acts as an advisory body for extension work in home economics.

The pattern of country organization for extension service differs considerablly depending upon the availability of funds, area of the county and administrative structure. Usually there is a county agricultural Office under the direction of the county agricultural agent and the staff includes a county agent, a home demonstration agent and in some cases additional personnel in agriculture, home economics or 4-H club work. Many of the countries have an advisory or planning committee, which has representatives of the leading organized farms groups of

county dealing with commodities, i.e. dairy products, fruit, cattle, cotton, etc., general farm organizations, natural and rural social groups, etc., depending upon the conditions of the county. The Committee is responsible to allow the discussion and adoption of the county extension program, to ensure that local problems are included, to recommend the budget to the proper authorities and to approve the appointment of personnel. But seldom interfers in the allocation of funds.

It may be mentioned here that the extension service in the United States represents all the branches of agriculture, i.e. crop husbandry, dairy, poultry, forestry, etc. Whereas the agricultural extension service discussed for West Pakistan refers only for crop husbandry.