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ORGANIZATION OF WATER MANAGEMENT FOR AGRICULTURE PRODUCTION IN WEST PAKISTAN (A Progress Report)

by Phillip O. Foss
John A. Straayer
Robert Dildine
Arlene Dwyer
Robert Schmidt

COLORADO STATE UNIVERSITY
FORT COLLINS, COLORADO
MAY, 1970

WATER MANAGEMENT
TECHNICAL REPORT NO. 2



**ORGANIZATION OF WATER MANAGEMENT FOR
AGRICULTURAL PRODUCTION IN WEST PAKISTAN
(Progress Report)**

Water Management Technical Report No. 2

by

**Phillip O. Foss
John A. Straayer
Robert Dildine
Arlene Dwyer
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**Colorado State University
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**ORGANIZATION OF WATER MANAGEMENT
FOR AGRICULTURAL PRODUCTION
IN WEST PAKISTAN**

**A CUSUSWASH Report Prepared For The
United States Agency For International
Development by The Department of Political
Science, Colorado State University
Fort Collins, Colorado, March, 1970**

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TABLE OF CONTENTS

	PAGE
SECTION ONE - INTRODUCTION.	1
Background on Pakistan.	2
Development as a Goal	5
Agricultural Development.	7
Development Requisites.	8
Impediments to Development.	9
Administrative Requisites	12
Impediments to Development Administration.	16
 SECTION TWO - ORGANIZATIONAL STRUCTURE FOR WATER MANAGEMENT IN WEST PAKISTAN	 20
The Irrigation Department	23
History.	23
Functions.	23
Structure.	27
Linkages with other Agencies	29
West Pakistan Water and Power	32
Development Authority	32
History.	32
Functions.	36
Organization	37
Personnel.	41
Linkages	44
Department of Agriculture	49
History.	49
Functions.	50
Structure.	52
Linkages with other Agencies	53

Agricultural Development Corporation.	54
History.	54
Functions.	56
Structure.	59
Linkages with other Agencies	61
Land and Water Development Board.	62
History.	62
Functions.	69
Linkages with other Agencies	74
SECTION THREE - PAKISTANI PERSONNEL SYSTEMS	78
Introduction.	78
Overview.	79
Public Services.	79
Training Services.	80
Employment Classes	82
Interrelationships	83
British-Indian Background	86
The Civil Service of Pakistan	90
Recruitment.	92
Training	93
The CSP and Development.	98
Implications for Agriculture.	100
The Shortage of Personnel.	105
Generalists and Specialists.	109
Transfer Policy.	110
SECTION FOUR - NEEDS FOR FURTHER RESEARCH	113

	PAGE
APPENDIX A.	117
Organization Chart, Government of Pakistan. .	118
Organization Chart, Government of West Pakistan.	119
APPENDIX B.	120
Progress Report and Plans for 1970-71	121
BIBLIOGRAPHY.	133

SECTION ONE

INTRODUCTION

This paper reports the preliminary findings of an investigation into the administrative aspects of water management in the area of agriculture in West Pakistan. The work was conducted by the Department of Political Science, Colorado State University, as one part of the larger project funded by AID and directed by Maurice L. Albertson of the Office of International Programs, Colorado State University. The research is part of an interdisciplinary study related to water management for increased agricultural production in West Pakistan, and involves the departments of Sociology, Political Science, Economics, Civil Engineering, Agricultural Engineering, and Agronomy.

The work undertaken by the department of Political Science during the first year (1969-70) involved an examination, through available secondary sources, of the organizational structure for water

management in West Pakistan. Three sub projects were delineated and included (1) a study or organization structure for water management, (2) a study of Pakistani personnel systems, and (3) a study of agriculturally related problems.

This report describes our progress to date. It provides some description of the organizational structure of Pakistan's public bureaucracy in the area of water management, and discusses some aspects of the Pakistani personnel systems. As this is a preliminary report based upon a review of a limited quantity of secondary materials, no substantive recommendations are made.

Background on Pakistan

Pakistan is the world's fifth largest nation with a population of approximately 130 million. Thirty million Pakistanis live on the flat and very fertile Indus Plain in West Pakistan. Twenty three million of these make their living from farming or closely

related occupations and produce 75% of all West Pakistan's food and fiber. West Pakistan is an arid to semi-arid region. Except for the foothill region in the north, the annual rainfall in West Pakistan averages less than 20 inches per year. The rainfall varies from 8 inches in Karachi to 18 inches in Lahore and 15 inches in Peshawar. The rate of rainfall is unreliable and the risk of failure in agriculture is high because of drought, or flooding from torrential rains.¹

Even though large areas in West Pakistan are rather parched, its agricultural potential is high because of the availability of river water for irrigation. The average annual inflow of the Indus River and its tributaries is equal to twice that of the Nile River and more than ten times that of the Colorado River. Half of the water which is carried onto the plain by the river is used to irrigate some 23 million acres--by far the largest single irrigated area on the earth's surface. This irrigated area makes

¹Report on Land and Water Development in the Indus Plain, (Washington, D. C., The White House, 1964), p. 1. This report will hereafter be referred to as the Revelle Report.

up almost two thirds of all the planted land in West Pakistan. There is, in addition to the rivers, a gigantic underground lake of fresh water. If this source of water were properly exploited through the use of tubewells, it could serve as a valuable supplement to canal waters.²

Despite its potential, agricultural production in West Pakistan remains relatively low. The causes for this low productivity can be divided into two categories: (1) agricultural factors generally, and (2) water related factors. The general agricultural factors include (1) primitive methods of cultivation; (2) the lack of agricultural inputs such as better feeds, fertilizers and pesticides; (3) the lack of such services as credit and marketing facilities; (4) the present system of land holding wherein farmers work small and widely separated plots and often work as tenant farmers. The water related impediments to increased production include (1) a shortage of irrigation water which prevents double cropping in some places and reduces production in all other areas;

²Ibid., p. 1.

(2) an accumulation of salt in the soil which is caused by over irrigation, poor drainage, and a lack of sufficient fresh water as well as a lack of drainage facilities to flush away the salts; and (3) a problem of waterlogging which is caused by a high water table, and results from the accumulation of excess water from over irrigation in low lying fields.³

None of these problems can be solved in a short period of time, and it may well be that some will never be fully eliminated. But some gains can in fact be made. Given set levels of resource input, advances can be maximized through intelligent, and coordinated development administration.

Development as a Goal

There is a deep and perhaps widening gap in the standard of living between the "have" and the "have not" nations. Large portions of Latin America, Africa, the Middle East, Southeast Asia, and the Asian sub-continent remain largely undeveloped as compared to Western Europe, the United States, Japan, or the Soviet Union. In recent decades the "have" and the "have not"

³Ibid., pp. 2, 3.

nations have both individually and jointly worked to close this gap and foster economic and social development in the "have not" nations.

Economic and social development generally defined implies an increase in the standard of living of the populations of the undeveloped areas. They mean, among other things, providing more and better food, a balanced diet, some consumer goods, and a little leisure time. In general, they mean providing for the peoples of less developed nations a standard of living more closely in line with that of the West.

There are a number of motives for pursuing economic and social development. One has to do, of course, with the humanitarian desire to provide people with shelter, with enough to eat and to give them a reasonable standard of living. Other motives for narrowing the gap between the "have" and the "have not" nations include attempting to assure greater world stability, and for countries like the United States, there is in addition an ideological rationale since "the U. S. has a basic interest in a peaceful and improving world environment in which to live."⁴

⁴Committee for Economic Development, Assisting Development in Low-Income Countries: Priorities for U. S. Government Policy, 1969, p. 11.

Agricultural Development

Advances in the agricultural sector of less developed nations are vital to the entire development process. More and better food is needed to provide an adequate diet. There are increasingly more people to feed and there is, as well, a need for a better diet to cope with problems of protein deficiency. There is evidence that protein deficient diets have not only physical effects but also have an adverse effect on mental development. Agriculture must provide employment for many of the people in the undeveloped areas, and it is not unusual for 70% to 90% of these population to make their living in agriculture. Further, agriculture must produce the capital and the raw materials for economic development in the non-agricultural areas. Surpluses for export must be developed to generate capital for the purchase of equipment, the construction of transportation systems, and so forth, in the industrial sector. From agriculture must come such raw materials as fiber for developing industries. If agricultural development lags, development generally will lag. Agriculture must provide subsistence, jobs, capital, and raw materials for balanced development. Gunnar Myrdal in

his Asian Drama says that, "Fundamentally it is in the agricultural sector that the battle for long term economic development in South Asia will be won or lost."

Development Requisites

There are numerous complex factors involved in the struggle for economic development. If possible, development in the agricultural and industrial sectors must be balanced. Agriculture must produce the capital and raw materials for industrial production and for export and the industrial sector must produce the tools for agriculture, must absorb displaced agricultural labor as economies of scale drive people from the farm, and must produce consumer products. Development balance is needed to insure the emergence of markets for the distribution of agricultural and industrial products, and the creation of transportation and communication systems to support both agriculture and industry. Some form of social security systems must be developed to generate incentives for farmers to reduce population. Capital must be generated domestically or imported from abroad and lending and finance arrangements must be established to support

developing industry and agriculture. Land reform is often badly needed to bring idle lands into production.

Additionally, development demands a balance between public and private sector growth. It requires efficient utilization of skilled, administrative, and technical personnel and it demands the development, use and transfer of information. It is enhanced by leadership, strong political backing and the support of effective and organized interest groups and political parties. Finally, among the most important requisites for development is planning and administration.

Impediments to Development

The fantastic array of factors which are involved in economic and social development suggests the existence of many formidable impediments to development. To review just a few, the unbalanced application of the benefits of technology such as fertilizer and water may not only fail to bear fruit but may in some cases prove dysfunctional. The over application of water may, for example, result in a rising water table

and in the development of a salinity problem.⁵ Second, there is often a temptation to spread available financial and other resources too thin.⁶ Development needs are usually so great that there is a strong temptation to spread out the limited available resources into a variety of functional areas and to spread them out geographically as well. Third, in the absence of controlled population growth it is next to impossible to advance beyond simply keeping up with population growth.⁷ Fourth, transportation and communication facilities in the underdeveloped countries are often lacking, and as there may be little profit in the development of such infra-structure facilities they have to be financed almost entirely out of already scarce public sector funds.⁸

⁵United Nations, Science and Technology for Development: Report on the United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas, Vol. III., Agriculture (New York: United Nations, 1963), p. 42.

⁶International Labour Office, "Some Aspects of Investment Policy in Underdeveloped Countries" in Leading Issues in Development Economics ed. by Gerald M. Meier (New York: Oxford Univ. Press, 1964), pp. 235-236.

⁷Frank W. Notestein, "The Population Crisis: Reasons for Hope" in The Developing Nations: Poverty and Progress ed. by Irwin Isenberg (New York: H. W. Wilson Co., 1969), pp. 101-104.

⁸Barbara Ward, The Rich Nations and the Poor Nations (New York: W. W. Norton & Co., 1962), p. 102.

Fifth, undeveloped countries tend to lack trained and skilled personnel in both technical and administrative areas.⁹

There are additional problems. Industrial growth is slowed by the lack of regularized working habits. Since people in undeveloped countries are extremely poor, there is great temptation to consume the results of advances in agricultural and industrial production rather than to divert them for use as capital.¹⁰ Land reform is extremely difficult to accomplish politically powerful elites who benefit from current land allocation schemes.¹¹ World markets are often such that it is difficult for developing countries to compete successfully. Many developing countries lack the necessary natural or physical resources for development and they often lack as well a cadre of

⁹J. J. Spengler, "Economic Development: Political Pre-Conditions and Political Consequences", in Political Development and Social Change by Jason L. Finkle and Richard W. Gable, (New York: John Wiley & Sons, Inc., 1966), p. 255.

¹⁰Robert L. Heilbroner, The Great Ascent, (New York: Harper & Rowe, 1963), pp. 74-75.

¹¹Ibid., pp. 128-130.

leaders or those with leadership potential.¹² Given the extended family phenomenon, people in the underdeveloped countries are prone to generate old age security through large families, thus aggravating the population problem.¹³ Finally, undeveloped countries lack educational systems to train the skilled human resources necessary for development. Where educational systems are fairly well developed, they tend to stress the humanities and law as opposed to the technical training which is so desperately needed for development.¹⁴

Administrative Requisites

Just as there are many factors necessary for economic and social development generally, there are a number of development requisites of an administra-

¹²Gunnar Myrdal, "Development and Underdevelopment", in Leading Issues in Development Economics, ed. by Gerald M. Meier, (New York: Oxford Univ. Press, 1964), pp. 235-236.

¹³Heilbroner, The Great Ascent, p. 92.

¹⁴Adam Curle, "Some Aspects of Educational Planning in Underdeveloped Areas", in Politics in Transitional Societies: The Challenges of Change in Asia, Africa, and Latin America, ed. by Harvey G. Kebschull, (New York: Appleton-Century-Crofts, 1968), pp. 298-302.

tive nature. A first and perhaps most crucial need is for skilled manpower.¹⁵ The rationale for planning for development is to speed the development process rather than simply allowing it to take its own course. This involves planning, of course, and the essence of planning is administration. Planning involves effective and efficient coordination of human and natural resources so as to achieve articulated goals. This involves the creation and implementation of plans, and requires as well the coordinated activity of large numbers of personnel with fairly high levels of administrative skill.

A second factor essential to effective administration is the existence of multi-directional communication systems. Effective administration of development plans requires communication from agency to agency, from project to project, and vertically between administrators and recipients of action programs. As related to agriculture this means communication of

¹⁵ Max F. Millikan and David Hapgood, No Easy Harvest, (Boston. Little, Brown and Co., 1967), p. 8.

ideas and problems between administrators and farmers.¹⁶

A third factor, and one closely related to communication, has to do with the attitudes of administrators. Vertical and lateral communication, and thus administration itself, is greatly affected by an administrator's belief relative to the right of citizens to receive government services, his attitude about a farmer's worth as an individual, his attitude toward work punctuality and his general attitude about governmental responsibility to the public. In short, development administration is generally enhanced by attitude structures which permit free and multi-directional communication, and which stress public service and responsibility.

Fourth, development administration is strengthened if employment systems are based on skill and merit, and if reward systems are based on merit and production and not solely upon kinship, seniority or friendship.

Fifth, it is important that systematic records be kept and that administrative units have effective memory systems so that decision making can utilize empirical data and thus avoid unwanted decisional consequences.

¹⁶See Ralph Braibanti, "Transnational Inducement of Administrative Reform: A Survey of Scope and Critique of Issues," in John D. Montgomery and William J. Siffin, ed., Approaches to Development, (New York: McGraw, Hill Co.), pp. 133, 134.

Sixth, it is important that mutual respect exist between subordinates and superiors within organizations. This is necessary so that authority may be delegated to subordinates in the field and permit the superior to trust the decision making capacity of the subordinate.

Seventh, it is important that administrators be supportive of and dedicated to, rather than resistant to, development as a goal. If other sub-goals interfere, the development process will be retarded.

Eighth, it is important that administrators be flexible in the design and execution of development programs, and attempt to tailor them to the culture and to the terrain. That is, it is important that administrators have the ability and the willingness to tailor and adapt programs to their settings.

Ninth, it is extremely important that administrators and agencies themselves establish political bases of support so that they can secure the needed resources for their development programs, so that they have the necessary political "muscle" to assure adoption and long term continuity for development programs.

Finally, it is extremely important that research programs be initiated and sustained, and that the data resulting from such programs be incorporated into the planning and implementation of development plans. The purpose of planning is, of course, to optimize developmental advances with limited resources. This requires the most efficient and effective coordination and utilization of available resources possible. It requires the accumulation and use of the political power necessary to secure resources. It requires the effective coordination of men and materials and to use these resources to achieve the stated goals of development.

Impediments to Development Administration

Just as there are numerous barriers to development generally, there are some significant problems common to underdeveloped countries which frustrate development administration. One of the most important has to do with a common lack of any sense of public service responsibility on the part of the administrative class. In the less well developed countries the administrators frequently feel that they have a

personal right to office and have no obligations of a public service nature. This may cause them to be disdainful of their clientele and to fail to respond to public demands. Such attitudes likewise impede open communication between administrators and clients.

Second, there is frequently a problem of class and/or caste which not only strains relationships between the client and administrator, but between administrators themselves at various levels of organizations. Third, nepotism, as a variation of the extended family phenomenon, is very common. That is, administrators in underdeveloped regions frequently secure and maintain employment and advancement not on the basis of skill but by knowing or being related to the right people. There exists, in other words, rampant patronage within the administrative systems of underdeveloped countries. Fourth, administrators often lack the training requisite for their job. This is related to the problems of nepotism and the lack of a felt need to act in the "public interest." Fifth, there is the problem of the sheer lack of administrative talent.

A sixth problem has to do with the frequency of excessive centralization of decision making which is

caused by the perceived inability of top level administrators to trust the judgement, the decisions and the information passed to them by their subordinates. The result is that top level administrators become bogged down with minor decisions. Finally, there is a problem of the lack of political control of, and political support for, bureaucrats. According to Fred Riggs, "Without firm political guidance, bureaucrats have weak incentives to provide good service whatever their expedient bureaucratic interests--tenure, seniority rights, fringe benefits, toleration of poor performance, the right to violate official norms--rather than to advance achievement of program goals."¹⁷

To summarize, the more serious administrative impediments to development include the lack of qualified, motivated and well placed administrative manpower; the absence of a propensity in administrators to feel dedicated to development programs and to be of service to the citizenry and their clientele; the existence of class or caste systems which impede both

¹⁷Fred W. Riggs, "Bureaucrats and Political Development," in Jason L. Finkle and Richard W. Gable, ed., Political Development and Social Change, (New York: John Wiley and Sons, Inc.), p. 415.

inter- and intra-organizational communications as well as communication between administrator and client; the lack of political roots for administration so that administrators can be controlled and provided with guidelines and incentive to performance; the tendency toward overcentralization; the frequent failure of administrators to communicate within and between organizations; and the tendency to recruit, place and reward employees on bases other than skill and performance.

SECTION TWO

ORGANIZATIONAL STRUCTURE FOR WATER MANAGEMENT

Introduction

Most of the responsibility for water management in West Pakistan is in the hands of five agencies or departments. These are the Irrigation Department, the Agriculture Department, the West Pakistan Water and Power Development Authority, the Agricultural Development Corporation and the Land and Water Development Board.

The Irrigation Department is a line department and was established at the time of partition as a counterpart to the old Indian Irrigation Department. Its chief functions involve the maintenance of canal water delivery and removal systems; the protection of irrigated areas against waterlogging, salinity and flooding; the conduct of hydrologic investigations and the use of this data to maintain needed flow levels in the various parts of the canal system; and the support of certain additional research activities directed toward improved water delivery and removal systems. In performing these functions the department

maintains several barrages and dams and thousands of miles of canals. The department is also involved in the construction of new water works, including the installation of tubewells.

The Agriculture Department, like the Irrigation Department was created at the time of partition. Its water related activities are restricted to land preparation and the maintenance of tubewells in relatively minor irrigation schemes. The department also carries on some research work.

The West Pakistan Water and Power Development Authority (WAPDA) was created as a public corporation in 1958 for the purpose of constructing and developing facilities for the exploitation of water and power resources. Today WAPDA supplies most of the electrical power in West Pakistan. Additionally WAPDA builds new major irrigation and reclamation works and upon completion, turns some of them over to other departments and agencies for operation and maintenance.

The Agricultural Development Corporations (ADC) were created in 1960. There is one in each wing. The purpose of the ADC's is to attempt to integrate all agricultural inputs. The ADC's operate several

large agricultural development projects, and their activities include the procurement of fertilizer and equipment, the promotion of collective agricultural enterprises and the management of state owned farms. The ADC's also construct some dams, canals and other irrigation works in a few project areas.

The Land and Water Development Board was created in 1964 to supervise new Salinity Control and Reclamation Projects (SCARP projects). Membership on the board of directors of the Land and Water Development Board includes the Secretaries or Chairman from such other departments and agencies as the Irrigation Department, the Agriculture Department, and WAPDA. The LWDB was created on the advice of the Revelle Report, and represents an attempt to organize and manage agriculture projects on the basis of land area rather than function. Project supervisory personnel are supposed to integrate all supplies and services provided by the functionally oriented line departments.

The Irrigation Department

History

At the time of Pakistan's partition from India in 1947 water was managed by the Irrigation Department of India. After partition, West Pakistan created a similar department of irrigation to manage her water resources. The department was charged with maintaining all existing distribution systems and with the construction of new works. It continued to carry out these functions until dissatisfaction with the department led to the transfer of some of these activities to WAPDA.¹

Functions

The functions currently performed by the Irrigation Department are as follows:²

1. Maintenance and, whenever possible, enhancement of operational efficiency of water distribution systems through various canals by proper upkeep of the headworks and the canal systems.

¹George Platt, "Agriculture: Administration and the Search for Expanded Productivity", in Administrative Problems in Pakistan, Guthrie S. Birkhead, ed., (Syracuse: Syracuse University Press, 1966), p. 103.

²West Pakistan Yearbook, 1968, Lahore; Information Department), pp. 25-26.

2. Protection of irrigation areas against water-logging and salinity by construction of surface drains for lowering the water table and quick disposal of storm water.

3. Protection of irrigated areas and abadis from flooding by construction of bunds and river training works.

4. Hydrological investigations for assessment of surface flows in rivers for regulating and distributing water among different canal systems according to their allocations and requirements.

5. Research work through statistical analysis, experiments, and model studies into problems of hydraulics, hydraulic structures, soil mechanics, physics and ground water for achievement of increased efficiency and economy in these fields.

6. Research work into problems of soil and water for reclamation of saline and alkaline lands and demonstration of the results thereof, for the benefit of farmers.

7. Survey and investigation in less developed areas such as Quetta-Kalat Region, for preparation of technically sound projects for extension of irrigation.

These stated purposes of the Irrigation Department can be broken down into two major areas-- operations and development. Operational responsibilities include management of 16 barrages, 3 dams, and about 37,969 miles of canals of different sizes. The Department also maintains 4,858 miles of drainage channels and more are being added all the time. From the time of partition to the present the average annual flow diverted from rivers through all the canals increased from 65,572 million acre feet (MAF) to 95,700 (MAF).

Recent budget figures suggest that the Department is increasing its development capacity at the expense of operations. During 1967-68, Rs, 900.00 lac were allocated to the Department of which Rs 620.07 lac or well over half of the allocations were for maintenance. The remaining Rs 279.83 lac were put into new schemes. However, in the 1968-69 budget of Rs 1,020.26 lac, Rs 587.02 lac was to be spent on operations and Rs 433.24 lac on new schemes.³

The Department performs four major types of development functions. The first is the multi-purpose

³Ibid., pp. 26,27.

development of dams, barrages, and projects. Some of the most important of these are listed below:

i) Warsak High Level Canal Allocation	Rs 13.33 lac
ii) Durrum Gardi Multi-Purpose Scheme	Rs 2.00 lac
iii) Thal Project	Rs 9.48 lac
iv) Taunsa Barrage Project	Rs 64.67 lac
v) Bakhat Extension Scheme Thal Project	Rs 20.00 lac

The total allocation for multi-purpose development is Rs 377.29 lac. The reason these projects are handled by the Irrigation Department rather than WAPDA is because most were begun by the Irrigation Department before the organization of WAPDA. The second major development function has to do with Survey and Investigation. The Department operates an Irrigation Research Institute at Lahore. This Institute has a Hydraulic Division and a Soils Mechanics and Physics Division. The Institute does research for WAPDA, ADC, and other government agencies. The Division on Soil Mechanics has done much of the research on existing tubewells in the SCARP projects. Also the survey and investigation functions included, in 1967, a special survey in the Quetta-Kalat region.

The third type of development function has to do with tubewell installation and the development of small irrigation schemes. By the end of 1968 the Department had installed about 700 tubewells for small irrigation projects in West Pakistan. These tubewells were installed to provide water to undeveloped areas and also to supplement canal waters so as to make non-perennial canals perennial. Further plans call for the installation of up to 3,000 tubewells for irrigation by 1970. Finally, the fourth development function deals with drainage and reclamation.⁴

Structure

The Irrigation Department is divided into administrative units called circles. Most are irrigation circles which command the headworks and canals that distribute surface water to farmers. The area commanded by an irrigation circle is determined by topographical rather than political boundaries. There are also tubewell circles and drainage circles.

⁴
Ibid., pp. 27, 28.

Superintending Engineers and the Executive Engineers are usually Class I Officers. Assistant Engineers might be classified as Class II.⁵ Zilladars (a type of tax collecting administrative assistant) work under the deputy collector and are revenue assistants. Their main functions involve assessment of land and establishment of water rates. Usually zilladars are Class III officers. The officer who relates most directly to the villager is the patwari. A patwari is an official primarily involved with water distribution. This involves the divisions of water, the timing of water delivery, and taking care of water demands as approved.⁶ The Irrigation Department employs about 700 engineers in its various circles. This compares to only about 466 in WAPDA's water wing of the Indus Basin Project.

The Irrigation Department is funded through both the central and provincial governments, and also

⁵Interview with Mr. Khalid Mahmood, Dec. 22, 1969. Class I officers are the highest ranking administrative officials in Pakistan. The classification system is explained in greater detail in Section Three.

⁶Agriculture Division, USAID/Lahore, Role of Nation Building Departments at the Union Council Level in SCARP-II-A, Concepts and Proposals, mimeo-pamphlette (Lahore: USAID, no date), p. 6.

through a water rate charged to zamindars or owners of property. The water rate is assessed in relation to the area and the type of matured crop. It is technically not a tax, but rather the State's share in the produce of the land or, in this case, the water.⁷ Michel comments about the water rates when he states:

"Water rates have remained fixed in most cases for the last 30 years. In West Pakistan, the Irrigation Department has been running a substantial deficit which is made up by indirect credits from the Land Revenue Department. A large subsidy has been implicit in the provision of water."⁸

Linkages with other Agencies

One of the Irrigation Department's most important linkages is with WAPDA, in that the Department

⁷Aloys Michel, The Indus Rivers, (New Haven: Yale Univ. Press, 1967), pp. 389, 390.

⁸Ibid., p. 392.

receives and operates new projects constructed by WAPDA. In the Chaj Doab project 213 tubewells, and in the Upper Jhelum Scheme 139 tubewells, have been handed over to the Irrigation Department.⁹ The Department also maintains a number of other projects which were built by WAPDA and transferred to the Irrigation Department for maintenance such as 486 tubewells in the SCARP II area.

In the Thal area the Irrigation Department is subordinate to the West Pakistan Agriculture Development Corporation (ADC) through the chairman of the Thal Development Authority or (TDA). This arrangement was made so that colonization and irrigation efforts could be coordinated.¹⁰

The Irrigation Department also has important linkages with the Land and Water Development Board. The Secretary of Irrigation is a member of the Board and the Department plays an important role in the SCARP projects.¹¹ In SCARP I, Irrigation Department

⁹ Ibid., pp. 32, 33.

¹⁰ Ibid., p. 50.

¹¹ Ibid., p. 500.

personnel work under the supervision of the Project Director. The Irrigation Department is in charge of SCARP II, and is assisted by both the Agriculture and Co-operative Departments. In SCARP II, the chief problem has been the malfunction of existing drains and since the Irrigation Department specializes in the maintenance of drains and canals, it is likely that SCARP II was given to them for this reason.¹²

In terms of relations with the Provincial Government of West Pakistan the Irrigation Department, like all other water management departments, must submit new plans having to do with nation building schemes (e.g., water management) to the Planning and Development Department. This Department then approves or rejects the various projected schemes and allocates funds accordingly. The funds are paid out by the Finance Department of the Province.¹³

Staff services relating to personnel and administrative organization and methods are handled by the Services and General Administration Department. This

¹²West Pakistan Yearbook., pp. 41, 42.

¹³Ibid., pp. 20-22.

Department controls services such as the Civil Service Pakistan (C.S.F.), Police Service Pakistan (P.S.P.), and others. As such it is the chief link between the Irrigation Department and both the training academies for these services and the National Institutes of Public Administration (N.I.P.A.) which are under the control of the central government.

The Irrigation Department has two indirect linkages with the central government. First, the Department relates to the National Economic Council through the Provincial Planning and Development Department. Funds from the National Economic Council are channeled to the Irrigation Department through the Provincial Planning Department. Second, high level Irrigation Department personnel are trained in the service academies under the Center's Cabinet Secretariat.¹⁴

West Pakistan Water and

Power Development Authority

History

In 1958 the West Pakistan Water and Power Development Authority was established with the responsibility

¹⁴Pakistan Quarterly, Vol. XII., No. 4, pp. 48-49.

of exploiting the water and power resources of the province.¹⁵ The impetus for its creation began in 1948 when the central government of Pakistan wished to build the Warsak dam with Canadian assistance. A public corporation was set up to build the dam but it soon became apparent it would also be necessary to provide for the transmission of power from the dam. This responsibility was given to the Pakistan Industrial Development Corporation (PIDC) but this did not prove entirely satisfactory for it separated water management from the production of electricity.¹⁶ Coupling this coordination problem with the need for a more forceful attack on the salinity and water-logging problems, plus the need to form one agency sufficiently impressive to attract foreign aid for the Indus Basin Project, the idea of creating a single "development-oriented" agency such as W.A.D.A began to take shape.¹⁷

¹⁵G. Ahmed, "Changes in the Administrative Organization of the Government of Pakistan since 1953", in *Public Administration*, Vol. 39, (Spring, 1961), pp. 355-356.

¹⁶Michel, The Indus Rivers, pp. 348, 349.

¹⁷Ibid., p. 350.

The form of this single agency had been suggested earlier by Rowland Egger in 1953 when he wrote, "Those activities of the government which are essentially commercial in nature should be organized as government-owned corporations, and should be permitted to operate with a maximum degree of independence of the controls necessary for the regular departments and ministries."¹⁸

At the time the Egger report was received, Pakistan was suffering from political instability and to Egger's disappointment, little was done to implement his suggestions. However, shortly after the martial law regime took over the nation in 1957, most of Egger's suggestions were put into effect.¹⁹

In 1958 the new military regime of Ayub Khan supported the newly created West Pakistan Water and Power Development Authority which had the responsibility for exploiting

18

Rowland A. Egger, "Ministerial and Departmental Organization and Management in the Government of Pakistan," in Public Administration, Vol. 39, London: 1961, page 152.

19

Ralph Braibanti, "Transnational Inducement of Administrative Reform: A Survey of Scope and Critique of Issues," in Approaches to Development: Politics, Administration and Change, John D. Montgomery and William J. Siffin (eds.) (New York: McGraw, Hill Book Company, 1966), pp. 142, 143.

the water and power resources of the West Wing. Again, the factors which led to the creation of WAPDA included the need for coordination of water resources with power, the need for an impressive agency to attract funds for the Indus Basin Project, the need to do more about reclaiming salinized and waterlogged land, and the Egger report.

Thus, after 1958, water was managed by both WAPDA and the Irrigation Department. The difference in their functions is described by Michel when he says:

"Since its establishment in 1958, WAPDA has controlled both power development and operations in West Pakistan, and with a few minor exceptions all water development (the Gudu Project was transferred from the Irrigation Department to WAPDA, but the Irrigation Department retains a few small development schemes....) Surface water operations are still controlled by the Irrigation Department which

still assesses and collects the water dues."²⁰

Functions

According to its basic laws, WAPDA's major functions include, (1) preparation for the approval of the Government of a comprehensive plan for the development and utilization of the water and power resources of West Pakistan on a unified and multi-purpose basis, (2) creation of a scheme or schemes for the Province or any part thereof, providing for all or any of the following matters:

- i) irrigation, water-supply and drainage; and recreational use of water resources;
- ii) the generation, transmission, and distribution of power; and the construction, maintenance and operation of power houses and grids;
- iii) flood control;
- iv) the prevention of waterlogging and reclamation of waterlogged and salted lands;

²⁰Michel, The Indus Rivers, p. 352.

- v) inland navigation; and
- vi) the prevention of any ill effects on public health resulting from the operations of the Authority.²¹

Organization

The above functions are carried out by the four "wings" of WAPDA; the administration and coordination wing, the power wing, the water wing, and the Indus Basin wing. Under its power wing, WAPDA supplies about 70% of the total electric power in West Pakistan. By 1964 WAPDA had thirty power stations. Total electricity generated has increased from 723 million kwh in 1959-60 to 2400 million kwh in 1964-65. It is estimated that the total capital investment in four to five years has quadrupled.²²

WAPDA's water wing is charged with construction of all of the new, major works for irrigation and reclamation. New works are usually assigned for maintenance and operation on the basis of fairly high

²¹Guthrie S. Birkhead, "Government by Corporations" in Administrative Problems in Pakistan, (Syracuse University Press, 1966), p. 124.

²²Ibid., p. 125.

policy decisions, to the Irrigation Department or Agriculture Development Corporation. However, not all operations are turned over to these agencies. In 1966, for example, WAPDA still operated the Warsak Dam. The water wing is also charged with extensive planning for the use of water resources in West Pakistan.²³

Recently WAPDA has been active in the construction of tubewells for reclamation projects. The 1968 West Pakistan Yearbook describes WAPDA's involvement in reclamation projects:

"Top priority is being given to the development of ground water resources in sweet water zone areas to remove waterlogging and salinity and to supplement irrigation water. It is now estimated that with an investment of about Rs 1,239 million (including Rs 400 million for tubewell electrification) during the third plan period, about 9,000 tubewells will be installed in

²³Ibid., pp. 126, 127.

various SCARP areas, of which 7,856 tubewells will be put into operation by June, 1970, covering 5 million acres and augmenting irrigation supplies by 10 million acre feet of water per annum. On the basis of the existing cropping pattern, about 2 million acre feet of the additional supplies will be given to wheat production."²⁴

The Indus Basin Project Division constitutes a third "line" wing of WAPDA. In the partition, Pakistan received nearly all of the irrigated land in northwest India even though most of the headwaters and rivers remained in Indian territory. In April, 1948, the government of the West Punjab in India stopped the flow of water of the three eastern rivers into Pakistan. The dispute which this action generated was settled by the adoption of an Indus Basin Plan advanced in 1951 by David Lilienthal. Basically the plan involves giving the waters of the three eastern rivers to India and replacing that water by

²⁴West Pakistan Yearbook, 1968, op. cit., p. 32.

means of constructing dams on the western rivers. After construction of the dams, water can be channeled to the areas in the eastern part of West Pakistan formerly served by the eastern rivers.²⁵

WAPDA's role in this Indus Basin Plan is described by Birkhead:

"WAPDA is Pakistan's agent to oversee the construction of the various projects comprising the Indus Basin Plan: two dams, seven canals, linking the rivers together, four diversions, barrages, a "syphon" to carry one canal under a river, and extensive remodeling of portions of the old irrigation system."²⁶

The two largest projects in the Indus Basin Plan are the Mangla Dam and the Tarbela Dam. The Mangla Dam, completed in 1967, was built largely with technical and financial help from foreign nations

²⁵Birkhead, "Government by Corporation," p. 137.

²⁶Ibid., p. 140.

with WAPDA as the supervisor of the entire project on behalf of the government of Pakistan.²⁷ The contract for the Tarbela Dam, to be completed in 1975, was awarded to a Franco-Italian consortium for execution. This too is being supervised by WAPDA.²⁸

The fourth wing provides staff services to the other three wings and is called the Administration and Coordination Wing. This wing not only has responsibility toward the "line" operations but also maintains contact with other water, government, and international agencies.

Personnel

Of all Pakistani governmental agencies, WAPDA is second only to the West Pakistan Railway in the number of people employed. The table on the following page gives the totals working under the various wings. Birkhead describes WAPDA's personnel practices when he says:

"In general, WAPDA's personnel practices are regulated closely

²⁷ Ibid., pp. 141-143.

²⁸ West Pakistan Yearbook, 1968, pp. 30, 31.

WEST PAKISTAN WAQDA EMPLOYMENT TOTALS AS OF JUNE 30, 1964

	Adminis- tration & Coordina- tion Wing	Power Wing	Water Wing Minus IBP	Indus Basin Project Division	Total	Con- trac- tors	Expa- triates with con- sultants	
Engineers	---	615	466	458	1,539	468	250	2,257
Officers (excluding Engineers)	91	95	318	160	664	168	82	914
Establishment (office workers)	488	7,444	5,219	2,660	15,811	3,571	2	19,384
Laborers (skilled unskilled, general utility)	341	24,938	18,337	4,530	48,146	27,220	---	75,366
Grand Totals	<u>920</u>	<u>33,092</u>	<u>24,340</u>	<u>7,808</u>	<u>66,160</u>	<u>31,427</u>	<u>334</u>	<u>97,921</u>

by the provincial government. It does have slightly more freedom here than do ordinary departments of government. For example, its salary scales have been allowed to ascend somewhat higher than those of other government agencies, and there are a few advantageous fringe benefits. Many of its professionals, however, are deputed from Irrigation and other departments of the provincial government. Their terms of service, including their salaries, are regulated by that government."²⁹

The top post in WAPDA has been held by Ghulum Faruque and Ghulam Ishaq, the chairmen until 1966. Both have been members of the elite Civil Service of Pakistan and have held many other top posts in the central and provincial governments.

²⁹Birkhead, "Government by Corporations", p. 133.

Linkages with other Agencies

WAPDA's chief linkage with the Irrigation Department consists of building dams, barrages, canals, and tubewells which are then turned over to the Irrigation Department for management and maintenance. WAPDA also obtains personnel from the Department, as was mentioned above. WAPDA's linkage with the Agricultural Development Corporation is similar. In areas of ADC operations, water works built by WAPDA are turned over to the ADC for operation and maintenance when such transfer is approved by the Provincial Government. WAPDA is also represented on the Land and Water Development Board. In the various SCARP projects WAPDA plays an important, if not leading, role.³⁰

WAPDA's linkages with the Provincial and Central Government are many and varied. It operates within its own organic law as well as within the legal framework of both the Provincial and Central Governments. Top management personnel are appointed by and can be fired by the Provincial Government. Furthermore, all development schemes must receive Pro-

³⁰West Pakistan Yearbook, 1968, pp. 38-43.

vincial and Central Government approval. Proposed schemes are reviewed at the Provincial level by an ad hoc committee which is expert in the subject matter under review. They then proceed to the Central Government through the Planning and Development Department of the Province where they are appraised by the Executive Committee of the National Economic Council to see if they are in line with the current five year development plan.

There is a further connection to the Central Government through the Comptroller and Auditor General who audits all of the WAPDA accounts. A move was made in 1963 to subject all transactions of WAPDA and other public corporations to review and potential veto by the provincial authorities. As of 1965, WAPDA and the other corporations were still resisting such controls by arguing that public corporations should be judged on their results rather than on their day to day operations.³¹

Given WAPDA's size and its role in large development projects, it has several rather unique connections to the Provincial and Central Governments. In

³¹Birkhead, "Government by Corporations", pp. 133, 134.

the words of Birkhead:

"It may.....by emphasized that for all WAPDA operations which are included in the provincial budget, the Authority generally reports to the provincial government through the Secretary of Irrigation and Power. Since, however, the chairman of WAPDA is an official of high status, dealing with matters of first importance, he has access to and indeed status equal to higher officials. For all matters concerned with Indus Basin Replacement Plan, WAPDA is the agent of the central government, and thus these matters do not go through the provincial department at all."³²

WAPDA also has some indirect linkages to International bodies. In 1960, the Indus Waters treaty

³² Ibid., p. 137.

was signed in Karachi by President Ayub of Pakistan and Premier Nehru of India. Under the Treaty a Permanent Indus Commission exists to survey treaty implementation. Birkhead describes WAPDA's relationship to the Commission:

"Pakistan's member on the Permanent Indus Commission reports back to the Joint Secretary for Natural Resources in the Central Government. His immediate superior, the Central Secretary of Industries and Natural Resources is the chairman of a body called the Indus Basin Development Board. This Board is the means of coordinating central provincial relationships on the Indus Basin works. It consults on expediting the construction of these by WAPDA and other agencies. It considers manpower problems, creation of new industries to provide materials,

and other general ways of coping with the impact of the huge building program. It serves, additionally, as the development working party for Indus Basin projects--That is, as the principle planning agency therefore. Its recommendations on Indus projects go directly to the Executive Committees of the National Economic Council and do not go through the Central Development Working Party as the other schemes and projects for WAPDA and other departments. This special status of WAPDA's Indus Basin Plan Projects distinguishes them sharply therefore from other undertakings of the Authority. WAPDA's chairman of course serves as a member of the Indus Basin Development Board, and WAPDA is also represented by its chairman or by other key officials in

reviewing at that high level
course of projects under the
Indus Basin Plan."³³

Because of the expense involved in the Indus
Basin Replacement Plan, WAPDA is indirectly linked
to donor nations through the Ministry of Foreign
Affairs.³⁴ Donor nations for the Indus Basin Water
Plan included Australia, Canada, Germany, New Zealand,
United Kingdom and the United States.³⁵

Department of Agriculture

History

Like the Department of Irrigation, the West
Pakistan Department of Agriculture has been in exist-
ence since the founding of the nation. This Depart-
ment has less to do with water management than any
other department under consideration. Although the
range of departmental activity is quite extensive,

³³Ibid., p. 140.

³⁴Ibid., p. 135.

³⁵Ibid., p. 139.

its role in water management is restricted to the construction and maintenance of tubewells in minor irrigation schemes, the construction of private tubewells, and land-leveling for more efficient irrigation and the reduction of waterlogging.

Functions

The functions of the Agriculture Department are as follows:

"The objectives of the department are agricultural extension, research, education in the specified fields, improvement of agricultural methods, provision of free services such as required for the control of pests and diseases, land development and installation of tubewells, etc., improvement of livestock, prevention and cure of animal diseases, conservation and development of forests, soil conservation, development of fisheries and projects of wild life."³⁶

³⁶West Pakistan Yearbook, 1965, (Lahore: Information Dept., 1965), p. 90.

The most significant water-related functions of the Department are carried out by the Agricultural Machinery Organization under the Agriculture wing of the Department. The West Pakistan Yearbook of 1965 describes the activities of the Agricultural Machinery Organization when it says:³⁷

It is engaged in the following activities:

- a) Land leveling by means of earth moving machinery.
- b) Ploughing/discing etc., of land by means of tractors.
- c) Drilling of tubewells and open wells.
- d) Operation and maintenance of workshops.
- e) Training of tractor operators.
- f) Research and Development of indigenous farm implements.

To undertake the above activities a fullfledged organization has been set up in the three regions. The work

³⁷Ibid., pp. 93, 94.

done by the organization has been summarized in the following table.

At this time a single tubewell is usually capable of helping to increase production on an area of 100 to 125 acres. In addition to constructing and maintaining some public tubewells, the Agriculture Department constructs a great number of private tubewells. It is estimated that over 25,000 private tubewells were installed during the period of the second five-year plan from 1960-1965.³⁸

Structure

The Department of Agriculture has a large, imposing, and diverse organization and is comprised of a Forest Wing, an Animal Husbandry Wing and an Agriculture Wing. The Agriculture Machinery Organization, which is active in the tubewell drilling and land-leveling, is a sub-division of the Agriculture Wing. Like other parts of the Agriculture Wing, it has offices at the Divisional Level. Thus, its unit of administration corresponds to the political boundaries within the province. This is the only agency involved in water management where this is

³⁸Ibid., p. 95.

the case. The Agriculture Machinery Organization presently maintains workshops at Multan, Jallpur, Lahore, Hyderabad, and D. G. Khan.³⁹

Linkages with other Agencies

Prior to the creation of the ADC and the Land and Water Development Board there were almost no structural linkages between the Department of Agriculture and other water management agencies. This is not to say that informal linkages do not exist at the district or Union Council level. Districts in non-SCARP, non-ADC areas do have development committees on which there are members of the Departments of Irrigation and Agriculture. However, the existence of interagency cooperation was largely dependent upon the personalities involved.⁴⁰

In both SCARP and ADC areas, personnel from the Department of Agriculture are seconded to the project directors. Also, the Secretary from the Agriculture Department is a member of the land and Water Development Board. A special relationship exists between

³⁹ Interview with Mr. Khalid Mahmood.

⁴⁰ Ibid.

the Department of Agriculture and the Agriculture Development Corporation since the ADC is an attached department of the former and reports to the provincial government through the Secretary of Agriculture.

A significant linkage "gap" appears to exist between the activities of the Agriculture Machinery Organization, which drills private tubewells, and other water management agencies. Although the large amount of available ground water has minimized difficulties thus far, some problems could develop in the future in the absence of policy level decisions or the creation and application of water law.

Like other provincial departments, the Agriculture Department reports to the Provincial Government through the Chief Secretary of the Province. Requests for funds are made through the Provincial Department of Planning and Development. Staff services are for the Agriculture Department and are handled in the same way as they are for the Irrigation Department.

Agricultural Development Corporation

History

In 1960 the Central Government authorized a study of Pakistan's agricultural needs and potential

by the Food and Agriculture Commission. The Food and Agriculture Commission (FAC) recommended the creation of a public corporation in both West and East Pakistan. These corporations, to be known as the Agriculture Development Corporations (ADC), would have as their primary responsibilities the integration of water and agricultural inputs so that agricultural yields could be multiplied. The initial focus was to be upon individual projects and this was to be expanded later to the entire country.

According to Michel, the organizational form of the ADC is to be as follows:

The East and West Pakistan ADC's would be semi-autonomous bodies with their own budgets exempted from the need to recruit through the Public Service Commission but able to borrow technicians "on extended temporary duty" from the older departments.⁴¹

This form reflected the felt need of the FAC to integrate water with other agricultural inputs and

⁴¹Michel, The Indus Rivers, p. 427.

reflected as well their preference for a strategy based upon "project areas." This idea of public corporation had also been accepted with WAPDA's initial success.

Functions

The primary responsibilities of the ADC are described by Platt:

"Thus the functions allotted to the ADC's included: 1) arranging on a commercial basis for supply of seed, fertilizer, 2) promoting cooperative societies with the aim of eventually handing all supply activities over to them; 3) assuming management of state farms when so directed by the government; and 4) promoting the production of farm machinery. In practice the corporations have limited themselves mainly to supply. They have moved into extension only in special project areas where the department representatives do not come, e.g., in

the new lands opened up by the Ghulam Mohammed Barrage in the lower Sind. There they are authorized to supercede the traditional bureaucracy."⁴²

The West Pakistan Yearbook describes the role of the ADC in water management as follows:

"In these projects the Corporation is engaged in hundreds of things which cannot be detailed.....In these projects, especially in GMB and Gudu work on digging up canals, constructing drains, setting up chako and mandi towns, laying out roads and farms, caring for animals and organizing cooperatives is in full swing.....In the field of irrigation over two thousand miles of canals have been built, 1,100 miles in GMB and 900 miles in Gudu Barrage since ADC came into the picture. Minor canals and distributories so far built extend over 2,000 miles. In Thal the

⁴² Platt, "Agriculture: Administration"..... pp. 101, 102.

capacity of the main canal has been extended from 6,000 to 7,500 cusecs. Besides, as a counter measure to salinity and waterlogging, 900 miles of drains have been dug in GMB benefiting over 11 lac acres."⁴³

As of 1967 the ADC had seven projects underway including the Ghulam Mohammed Barrage Project, the Gudu Barrage Project, the Thal Project, the Taunsa Barrage Project, the Soan Valley Land Improvements Projects, Small Dams Organizations and Agricultural Estates.

Besides building and maintaining irrigation works in certain project areas, the ADC is also in charge of the Small Dams Organization. The function and history of the Small Dams Organization, up to its adoption by the ADC, is described by the West Pakistan Yearbook:

"Small Dams Organization was set up in December, 1960 under the direct control of the Governor of West Pakistan by constructing dams of low and medium height on

⁴³West Pakistan Yearbook, 1968, pp. 46, 47.

small catchments. The objective was to conserve and develop water resources for boosting up food production and also achieve some measure of soil conservation and flood protection, besides providing drinking water to the villages nearby. In 1962, the Small Dams Organization was transferred to Agricultural Development Corporation, West Pakistan."⁴⁴

The ongoing functions of the Small Dams Organization are to construct dams in certain areas and to investigate new sites. As of 1968, work was already progressing on seven dams and investigation had been carried out at 16 additional sites.

Structure

For the most part, the ADC structure varies according to the project areas it administers. Thus, each project area is governed by a project director

⁴⁴Ibid., p. 35.

who has charge over all of the activities connected with development within the area. Staff is seconded to the project director by other agencies.⁴⁵

Platt comments on one aspect of the personnel problem in the organization of the ADC when he says:

"The ADC's are confronted with the same set of exhausting circumstances that have plagued previous programs: small farms, poor soils, ancient farming methods, lack of credit, and lack of education. In addition, they have continuously faced the difficulty of obtaining competent professional personnel. The departments hold an almost total monopoly of experienced agricultural specialists, and they have given few indications of willingness to share this scarce resource."⁴⁶

⁴⁵Interview with Mr. Khalid Khan.

⁴⁶Platt, "Agriculture: Administration", p. 101.

Linkages with other Agencies

The ADC has fairly few linkages with other water agencies. It stands in a receivership relation to WAPDA, managing the various water projects which are turned over to it. It also stands in a competitive/cooperative relationship to the Irrigation Department, at times vying for maintenance responsibilities for new work. In the Thal area, the Irrigation Department has been placed under the ADC through the chairman of the Thal Development Corporation. The chairman of the ADC also serves in a part-time capacity as a member of the Land and Water Development Board, together with the heads of other agencies.

In regard to linkages with the Provincial Government of West Pakistan, ADC has approximately the same linkages in terms of planning, finance and personnel as does WAPDA. However, it reports immediately to the Provincial Government through the Department of Agriculture rather than through the Department of Irrigation as is the case with WAPDA.

One chief characteristic of the Agricultural Development Corporation is its fragmented nature. It

has direct responsibility for a number of colonization areas, but it also has a small dams division and is partially responsible for the distribution of agricultural inputs.

Land and Water Development Board

History

When WAPDA was formed in 1958, it was given responsibility to deal with the problems of waterlogging and salinity WAPDA devised a reclamation plan in 1961. The unveiling of this plan coincided with a number of other events. Vice President Lyndon Johnson visited West Pakistan in May of that year and he was briefed on the agricultural problems. Shortly thereafter, Dr. Abdus Salam visited the Massachusetts Institute of Technology and talked with Jerome B. Wiesner, Science Advisor to President Kennedy. President Ayub visited Kennedy in July of the same year and the foundations were laid in Pakistan and the United States for a high level investigation of the waterlogging and salinity problems.

After President Ayub's visit a study team was assembled by Jerome Wiesner and was later directed by

Dr. Roger Revelle. Comprised of both technical experts and generalists, the panel and its staff studied salinity and waterlogging together with other agriculturally related problems.⁴⁷

Although the Wiesner-Revelle mission was to study waterlogging and salinity, the recommendations in their final report (henceforth Revelle Report) dealt mainly with the need for integration of water with other agricultural inputs. They recommended a reoriented agricultural production strategy which would concentrate all efforts of water management agencies and agricultural input agencies upon a few project areas. Administratively speaking, it called for a shift from organization by function to organization based upon project area.⁴⁸ In the words of the report:

We propose that the major part of the culturable lands of the Indus Plain be divided into some 25 to

⁴⁷ Ibid., pp. 475, 476.

⁴⁸ The White House, Report on Land and Water Development in the Indus Plain, (Washington D. C., Government Printing Office, 1964), II, p. 4. This document is also referred to as the Revelle Report.

30 project areas of roughly a million acres each, manned by a competent and adequate staff under the supervision of a vigorous director with responsibility for modernizing the agriculture of his region and provided with the necessary equipment and supplies. In each project area tubewells or other means of drainage would be constructed to control the level of ground water and salt soil content, and where possible, to increase the supply of irrigation water. Chemical fertilizer containing 40 to 50 million pounds of nitrogen would be provided each year; together with better seeds and means for control of plant diseases, insects, and weeds. Maintenance shops for machinery and motor vehicles, and facilities for in-service training, applied research, and plant

experimentation, would be constructed and operated..... For the first five or six years we would propose to bring in project areas at the rate of about one a year. The entire development would be spread over more than a generation.⁴⁹

At the suggestion of the Pakistan government the Revelle Report also recommended a form of organization for the project areas. The panel recommended that the government of West Pakistan mobilize its efforts in the project areas around the legal powers already given to its Soil Reclamation Board. The Board would be renamed and called the Land and Water Development Board, and its members would include the Secretary of Irrigation, the Secretary of Agriculture, the Chairman of the Water and Power Development Authority (WAPDA), the Chairman of the Agricultural Development Corporation (ADC), the Secretary of Labor and Cooperatives, the Secretary of Local Government and Basic Democracies, and a Finance Member.⁵⁰ Thus,

⁴⁹Revelle Report II, pp. 4, 5.

⁵⁰Ibid., p. 16.

in July of 1964, the Land and Water Development Board was created out of the old Soil Reclamation Board. Its membership was just as recommended by the Revelle Report except for the substitution of the member for Land Reforms of the West Pakistan Board of Revenue in place of an additional Chief Secretary as chairman.⁵¹

Even though the Land and Water Development Board was created and given control over the first Salinity Control and reclamation Projects (henceforth SCARPs) little was done to initiate new projects. Michel says:

"It is somewhat disturbing that the Board has not yet moved in the direction of appointing project managers and allowing them to organize and administrative, farmer training, credit and experimental services over the initial three to four years of each project area as recommended by the panel. For the early

⁵¹Michel, Indus Rivers, p. 500.

administrative start, embodying both a concentrated localized application and the cumulative development of a cadre of specialists, represents not only an essential feature of the Revelle approach but undoubtedly one of the most difficult to achieve in the intertwined context of traditional farming attitudes and bureaucratic inertia in West Pakistan.⁵²

Even though the Revelle panel's suggestions were neither original nor altogether put into practice, they did accomplish a number of important things.

Michol states:

Precedents can be found for most of the elements in the Revelle approach, but the combination and emphasis were novel. The Revelle panel analyzed and endorsed the mas-

⁵²Ibid., pp. 500, 501.

sive approach embodied in WAPDA's SCARP I, suggested modifications in the scope and phasing of WAPDA's master plan of May 1961, endorsed ADC's multifactor approach but asked for a much more concentrated application, and at the urging of Pakistan, made specific recommendations for long-range administrative arrangements. Of all the panel's recommendations, substitution of an administrative structure based on a limited area rather than function, initial and ultimate concentration on the better lands, heavy emphasis upon fertilizer inputs, and the stress upon the principle of interaction represent the major contributions.⁵³

The West Pakistan Land and Water Development Board was placed in charge of a Salinity Control and Reclamation Project (SCARP) in Central Rechna Doab

⁵³ Ibid., p. 489.

called SCARF I. This project had its origin in several schemes framed by the Ex-Punjab Government and was initiated in 1962 through the installation of about 1300 tubewells. It was hoped that these wells would provide additional irrigation water, lower the water table, and could then be coordinated with other agricultural inputs in the project areas.⁵⁴

Functions

The first objective of the Land and Water Development Board (LWDB) is to fully eliminate the water-logging and salinity in project areas and restore the soil to health. The second objective is coordination of additional water supplies with other agricultural inputs such as better seeds, fertilizers, pesticides, credit and marketing facilities. The West Pakistan LWDB has attempted to carry out these objectives by establishing a field organization to coordinate and integrate the activities of various departments and put them under the direct administrative control of a project director.

In 1968 there were two field operations under the control of the Board. The Yearbook of 1968 cites

⁵⁴West Pakistan Yearbook, 1968, p. 39.

these when it states:

"At present there are two projects in operation with the Board:

- 1) Salinity control and Reclamation Project No. 1 (SCARP I) comprising 1.2 million acres in the Sheikhpura Gujranwala, Lyallpur, and Jhang Districts.
- 2) Salinity Control and Reclamation Project, Khairpur (SCARP - Khairpur) covering 0.3555 million acres of the ex-Khairpur State."⁵⁵

The commanded area of SCARP I is 1,140,678 acres out of which 424,717 acres had been affected by waterlogging or salinity. By 1967 just over one half of the affected area had been reclaimed. The ground water depth in the project area had been lowered an average of about 9 feet, and this completely eliminated waterlogging. Yields increased by 94% in one year and financial gains have become three-fold in the same amount of time.⁵⁶

⁵⁵Ibid., p. 38.

⁵⁶Ibid., p. 41.

The SCARP - Phairpur project comprises about 355,000 acres and is divided into two blocks - East and West of the Rohri Canal. The Yearbook describes the objective of the project:

The objective of the project is to lower the ground water to depth of about seven feet and then to control it as that depth. The project also envisages the utilization of the pumped supplies, wherever it is of good quality to increase area under irrigation.....where there is no demand for additional irrigation supplies and where the salinity of the pumped water precludes its direct use the wells discharge into a system of shallow unlines drains.⁵⁷

It is still too early to evaluate either the reclamation of soil or the increase of yield and income.

Besides direct operation of SCARP I and SCARP - Phairpur, the MWDB assists the Irrigation Department

⁵⁷ Ibid., p. 42.

in its work on SCARF II which comprises most of the Chaj Doab. While this project is operated by the Irrigation Department assisted by the Agriculture and Co-operative Departments, 138 tubewells (those in the Mona Scheme) are the responsibility of the LWDB and are being operated by WAPDA for research purposes on behalf of the Board.⁵⁸

Membership on the Land and Water Development Board is patterned after the recommendation of the Revolle Report.⁵⁹ In Michel's words the LWDB is made up of:

Member for Land Reforms, Board of Revenue (Chairman of the Management Board); Chairman WAPDA; Chairman, West Pakistan ADC; Secretary to Government of West Pakistan for Finance; Secretary for Agriculture; Secretary for Irrigation and Power; Secretary for Co-operation,

⁵⁸ Ibid., p. 42.

⁵⁹ The Revolle Report II, p. 180.

Labor, and Social Welfare; and
Secretary for Basic Democracies
and Local Development.⁶⁰

A more recent publication lists the Chief Secretary of the Government of West Pakistan as the ex officio Chairman of the Board. According to the report of the Irrigation and Agricultural Consultants Association, the full Board meets only once every two months and this leaves the coordination tasks up to each project director.

At the time of the IACA's report, only one project director had been placed and he was given charge over the SCARP I command. As was envisioned by the Revelle Report, he was given the overall command of development of activities. The staff in SCARP I are seconded from the regular departments and carry out extension, reclamation, input supply, and irrigation activities.⁶¹

⁶⁰Michel, The Indus Rivers, p. 500.

⁶¹Lieftinck and Associates, Water and Power Resources of West Pakistan, Vol. II, pp. 190, 191.

Linkages with other Agencies

No other water management agency has as many formal ties to other departments as does the Land and Water Development Board. Every other water management agency is represented on the LWDB by its Secretary or Chairman. The LWDB is also linked with departments dealing with other aspects of agriculture, such as Land Reform, the Board of Revenue, the Co-operation Department and the Basic Democracies. It is attached to the Department of Land and Water Development.

Organizational Reform

Ralph Braibanti, one of the foremost students of Pakistani Administration states that:

"Since Independence in 1947 through 1964, efforts to reorganize the structure of government and to improve procedures of administration have been the subject of twenty eight major reports totaling 3,621 pages and involving the participation of 146 commission members."⁶²

⁶²Ralph Braibanti, Research on the Bureaucracy of Pakistan, (Durham, North Carolina: Duke University Press, 1966), p. 213.

Most of these reorganization studies, Braibanti adds, have been initiated and conducted by Pakistanis, although a few have been done by foreign consultants.

Most of the studies of organizational reform have dealt with Pakistani government and administration in general, although a few have been specifically concerned with agricultural or personnel administration.⁶³ The Proposals for reform which have resulted from these studies have tended to center upon three problems: (1) the Secretariat system and the supposed resultant impediments to Secretariat relations with line agencies;⁶⁴ (2) the "over-centralization" of decision making;⁶⁵ and (3) the highly stratified and rigid personnel systems.⁶⁶

⁶³Chapter Four of Braibanti, Ibid., is devoted entirely to brief reviews of the twenty eight reform studies.

⁶⁴Problems associated with the Secretariat system are discussed in a 1953 Ford Foundation sponsored study by Rowland Egger entitled "The Improvement of Public Administration in Pakistan." This report is discussed in Braibanti, Ibid., and Henry F. Goodnow, The Civil Service of Pakistan, (New Haven: Yale University Press, 1964), pp. 210-214.

⁶⁵This problem is also treated in the Egger Report.

⁶⁶This problem is discussed in several reports including the Egger Report, a report by Robert Abramson, "Public Administration Training and Personnel Management Reform in Pakistan," prepared in 1969 for USAID, and Goodnow, op. cit., most of Chapter 9.

To cope with these problems a variety of recommendations have been advanced. These include (1) the establishment of more grassroots influence in governmental decision making; (2) greater allocation of duties to the various functional departments by a cabinet committee; (3) a greater decentralization of decision making autonomy throughout the bureaucracy; (4) an opening of the stratified personnel systems; (5) the utilization of a program budget; (6) the abolishment of the Secretariat system; (7) the strengthening of the public service commissions so that they can act as "watch dogs" on the various civil services.⁶⁷

Two studies more specifically related to water management include the Revelle Report⁶⁸ and a study by Robert Schmidt.⁶⁹ The Revelle Report viewed agricultural development as a "systems problem", and argued that waterlogging and salinity were not isolated

⁶⁷These suggestions for reform are contained in the studies cited above.

⁶⁸Revelle Report, op. cit.

⁶⁹Robert Schmidt, The Organization of Water Management in West Pakistan, unpublished MA Thesis, Colorado State University, 1970.

problems. The Report went on to call for the establishment of more SCARP projects based on an area rather than a functional basis, and urged greater efforts to integrate the various agricultural inputs. It recommended the establishment of the Land and Water Development Board as one specific administrative reform to assist such integration. Robert Schmidt's study, a Master's Thesis done at Colorado State University called for greater administrative decentralization (in the major line agencies especially) and hypothesized that some decentralization will occur shortly as a result of the current political forces which are pushing for a partitioning of the West Wing.

Some of the reforms advanced by these many study commissions have been adopted; but many have not. Two of the major obstacles in the adoption of reform proposals have included a lack of trained personnel, and the resistance of established interests.⁷⁰

⁷⁰The shortage of trained personnel for work in the field is discussed in Pieter Lieftinck, et. al., International Bank for Reconstruction and Development, Water and Power Resources of West Pakistan, (Baltimore: Johns Hopkins University Press, 1968), p. 192, and the resistance of established interests to reform is discussed throughout Chapter Four of Draibanti, op. cit., and is exemplified by the fact that the fairly sweeping Egger Report, among others, was suppressed for several years after its completion.

SECTION THREE

PAKISTANI PERSONNEL SYSTEMS

Introduction¹

Information about the personnel system of Pakistan is uneven and scattered. Some facets of the system, the elite Civil Service of Pakistan (CSP), for example, have been studied in considerable detail and information is fairly accessible. Data on other aspects of the system, relative to the differential placement of members of various services in government positions, is almost non-existent. The portion of the report which follows in this chapter reflects the uneven character and availability of data. The chapter contains (1) a very brief overview of the entire personnel system, (2) some

¹The data for this introduction were obtained primarily from Ralph Braibanti, Research on the Bureaucracy of Pakistan, (Durham, North Carolina: Duke University Press, 1966), Henry F. Goodnow, The Civil Service of Pakistan, (New Haven: Yale University Press, 1964), and Robert Abramson, "Public Administration Training and Personnel Management Reform in Pakistan," Report to USAID August 18, 1969.

discussion of the historical roots of the system, (3) a look at one portion of the system, namely the Civil Service of Pakistan (CSP), and finally (4) some speculation as to the implications of the system for agricultural development

Overview

There is no single public personnel organization in Pakistan. Rather, the system is composed of three "public service commissions", several dozen training "services", and four tiers of government jobs, all of which are interrelated in rather complex fashion. The four public service commissions recruit employees, assign them to one of the many training services, and eventually appoint them to a government position in one of the ranks in the four tier system.

Public Services

There are three public service commissions in Pakistan, one for the central government and one each for the East and West Wing. These commissions recruit employees and, through competitive examination, assign them to one of the many training services. After completing a specified course of study and training, and in some cases after another examination, employees

are assigned by the public service commission to a government job in some agency (e.g., the Agriculture Department) at one of the four levels in the job hierarchy.

Training Services

As noted above, after recruitment into government service, but before actually being appointed to a position, employees are assigned by one of the public service commissions to one of the many training services. These services are stratified vertically, some being more prestigious and politically powerful than others. Some of these training services receive appointees from the central government public service commission, and some from the two provincial commissions. The training services associated with the central government commissions are more prestigious than those related to the provincial commissions. The most prestigious of all the services are a group of "central superior services", with the Civil Service of Pakistan (CSP) being the most prestigious and powerful of all.

As suggested above, these training services are functionally oriented, are stratified vertically and exist at both the central and provincial governmental

levels, with the "central superior services" comprising the most prestigious and powerful group of services. These services include:²

1. Civil Service of Pakistan
2. Pakistan Foreign Service
3. Police Service of Pakistan (W. Pakistan)
4. Police Service of Pakistan (E. Pakistan)
5. Pakistan Audit and Accounts Service
6. Pakistan Railway Accounts Service
7. Pakistan Military Accounts Service
8. Pakistan Taxation Service
9. Pakistan Customs and Excise Service
10. Telegraph Engineering Service, Class I
11. Post and Telegraph Traffic Service, Class I
12. Telegraph Traffic Service, Class I
13. Pakistan Postal Service, Class I
14. Pakistan Railway Service of Engineers
15. Pakistan Railway Transportation (Traffic & Commercial Service)
16. Central Engineering Service
17. Pakistani Military Lands and Cantonments Service

Some insight into the operation of these services is offered by Braibanti:

After recruitment each cadre is separately administered, and posts are reserved specifically for members of particular cadres. There is virtually no interchange of personnel; indeed, the functions of each cadre are compartmentalized and there is only rarely any working contact between members of different cadres.³

Employment Classes

There are four tiers or classes of government positions in Pakistan, which are ranked according to the importance and responsibility of the work involved. Class I jobs, for example, are the top level administrative positions, while such employees as janitors occupy Class IV positions. Persons holding positions in the top two levels are referred to as the "gazetted" officials which means that their

³Ibid., p. 136.

appointments and transfers are reported in the official government gazette. These top two levels are purely administrative in nature and employ only about one and two per cent of the public employees respectively.

The total combined strength of Class I and II officers amounts to approximately one or two per cent of the total public employment.⁴

Class III employees constitute approximately 60 per cent of the public employees and are primarily clerks who work under the supervision of Class I and II officers. Class IV employees are those who perform menial tasks--messengers, laborers, and others.⁵

Interrelationships

The interrelationships among the public service commissions, the training services and the various ranks of government employment can perhaps be best explained by using two contrasting examples. First, a prospective government employee may take a competitive examination administered by the Central Public Service Commission (one of the two central government commissions) and, based upon his performance, be

⁴Abramson, op. cit., p. 12.

⁵Ibid.

assigned to one of the training services. If he performs well on the exam he may be assigned (or appointed) to one of the more prestigious services. Then, because of his appointment to a prestigious service, he will, upon completion of his training program, be assigned by the Central Public Service Commission, to a Class I level job in some government agency--the Irrigation or Education Departments for example.

On the other hand, a person may perform poorly on his initial examination. If he does, he will probably be assigned to a low prestige training academy and thus upon completion of his training will be appointed to a low level job--a Class III or IV position.

Several additional points should be made about this series of complex interrelationships. First, it is clear that one receives a more prestigious job by his having been assigned to a prestige training service by performing well on the initial set of examinations. Second, the training services associated with the two central public service commissions (those to which personnel recruited by the central public

service commissions are assigned), and the jobs which are filled by their people, are more prestigious than those associated with the two provisional commissions. Third, once a person is assigned to a training service, he remains throughout his career a member of that service. Fourth, many government jobs are specifically reserved, by the four public service commissions, for appointees from the various training services. Top level positions, for example (Class I jobs) are reserved especially for persons from the most prestigious training services, the Civil Service of Pakistan (CSP) especially. Thus, since the initial examinations determine the training service to which one is assigned, and since the government job one eventually receives depends largely upon the training service to which one belongs, it is clear that the career fate of public employees is determined very early.

To summarize, then, government employees are members of one of the many training services. The service in which they are members is largely a result of their performance on entrance examinations. The services themselves are rigidly stratified in a caste-type system with some services, the central superior services especially, being much more prestigious and politically powerful than others. Government positions

are ranked in a four tier hierarchial system, and positions at each level are reserved or set aside for members of certain of the services. The more important government jobs are reserved for members of the most prestigious services. Thus, the future of public servants is decided early. One's government position is set by the service of which he is a member, and the service of which one is a member is determined very early by the central or provincial service commissions which place recruits into one of the training services according to his performance on entrance examinations.

The British-Indian Background

The present Pakistani personnel system has its roots in the Indian personnel system which was developed by the British several centuries ago. The Indian system can be traced back to the arrival of the East India Company on the subcontinent. The company had the responsibility of carrying on commercial, military, and administrative operations in India. This power was officially granted in 1600 by Queen Elizabeth of England.⁶

⁶Goodnow, op. cit., p. 31.

The administrative function during this period consisted of two major tasks: (1) maintaining law and order; and (2) collecting revenues. These two functions correspond with the functions of administration in traditional or pre-development societies.⁷ The evolution of the bureaucracy in India reflected both the response to needs in India, and the reform efforts in England. Native Indians were recruited into the upper levels of the bureaucracy, and formed what is known as the Indian Civil Service (ICS). The ICS was a mixture of British and Indian bureaucrats and was the elite cadre of the bureaucracy. At partition, a counterpart service evolved in Pakistan known as the Civil Service of Pakistan.

The ICS was a generalist administrative service composed of primarily wealthy, upper class, well educated personnel. The outlook of ICS members was western.⁸ The members filled all of the top administrative posts in India and because of the relative power of the bureaucracy, they had virtual control of

⁷V. A. Panandiker, "Developmental Administration: An Approach", Indian Journal of Public Administration, Vol. 10, No. 1, (January, 1964), p. 37.

⁸Goodnow, op. cit., p. 32.

the country. Members were recruited on the basis of competitive examinations which stressed knowledge in the humanities.⁹ Its members were "gentlemen generalists" possessed of vast knowledge in social graces, horsemanship, etc. Ultimately this generalist tradition was carried over into the CSP, and still exists today. Van Vorys lists a series of characteristics which marked the Indian bureaucracy.¹⁰

1. It was small in size.
2. There were clear and decisive demarcations among the various categories of civil servants.
3. An elite corps, the Indian Civil Service, filled top decision-making positions as well as key posts on all levels.
4. There were differential material rewards, differential privileges, and differential rates of promotion.
5. There was esprit de corps in each service which reinforced cadre patterns.

⁹Ibid.

¹⁰Karl Van Vorys, Political Development in Pakistan, (Princeton, N. J.: Princeton University Press, 1965), pp. 109-110.

6. The bureaucracy was highly independent.
7. The bureaucracy was highly oriented to Western values.

With partition from India in 1947 the task of governing the newly created state of Pakistan fell most heavily upon a small number of Indian civil servants who chose to cast their lot with the new nation. In the words of Frank Goodnow;

"There was no time for administrative innovation. The path of least resistance was to adopt the same organization, procedures, and policies that had prevailed for so many years in India. The same dog-eared manuals of administrative procedure that had been used in India were followed in Pakistan."¹¹

Not surprisingly, therefore, the Pakistan personnel system bears some marked resemblances to the Indian system. It contains a large number of functionally oriented "training services". The services are stratified in hierarchial fashion with greater prestige

¹¹ Abramson, op. cit., p. 14.

and political power accruing to the services at the top of the pyramid. Positions in government are reserved for the various services, with the highest paid, most prestigious and most powerful administrative jobs being set aside for members of the most prestigious service, the CSP. The system is quite rigid in that persons very seldom transfer from one service to another and upward mobility is therefore retarded. In general, the system is stratified, elite oriented and controlled, rather rigid, and those with generalist rather than specialist skills dominate.

The Civil Service of Pakistan

As discussed above, the Pakistani personnel system is composed of a large number of functionally oriented and hierarchially stratified services. The most prestigious and politically powerful of the services is the Civil Service of Pakistan (CSP). The CSP has a total membership of approximately 530 officers, more than any of the other sixteen Central Superior Services. This corresponds with the pre-partition Indian and British tradition of maintaining small sized services.

The CSP is a direct descendant of the Indian Civil Service, and some present CSP members served in the ICS

prior to the partition. Speaking of the CSP, Braibanti states that it is

...unique among the systems inheriting the imperial tradition of the ICS in the respect that its sense of exclusiveness and imperiousness have been only slightly affected since independence. It remains a distinctive, cohesive entity, with a high degree of elan. It is the matrix through which pre-independence British values are diffused throughout the bureaucratic system, and at the same time it controls the arena in which highly dynamic reform is taking place.¹²

Clearly, the presence of former ICS members in the CSP, especially in the early years, helped to shape the present structure of administration in Pakistan. It is not surprising, therefore, that the CSP mirrors former practices and values which were found in the

¹²Braibanti, op. cit., p. 121.

ICS--practices and values stressing exclusiveness, elitism and superiority.¹³

Recruitment

CSP recruits must be between the ages of 21 and 24, be a college graduate, and pass the competitive examination administered by the Central Public Service Commission. The examination consists of a total of 1400 points divided between written and oral sections. The written section consists of three compulsory subjects--500 points--(essay, English, and general knowledge), and thirty optional subjects from which the applicant may choose totalling 500 points.¹⁴ It is interesting to note that as an optional subject, public administration counts the lowest amount of points--100--as compared with most other areas counting 200 points.¹⁵

The second part of the recruitment examination is the oral interview. The interviews are conducted by

¹³Ralph Braibanti, "The Higher Civil Service of Pakistan" in Ralph Braibanti, (ed.), *Asian Bureaucratic Systems Emergent from the British Imperial Tradition*,

¹⁴Ibid., p. 259.

¹⁵See footnote on Ibid., p. 259.

a panel of members from the Central Public Service Commission. The interviews are conducted in English-- a practice which excludes a large number of Pakistanis. The examination is taken by all prospective employees of the Central Superior Services and appointments are made according to the scores for all applicants in a given year.

Each year the CSP recruits approximately thirty new members.¹⁶ This figure varies from year to year depending on need.

Training

Once an applicant completes his examinations and is inducted into the CSP he is sent to the Civil Service Academy in Lahore, West Pakistan. Training at the academy lasts for nine months during which time the recruit is exposed to a variety of areas. The overriding purpose of the training period is to impart a common set of values and behavior patterns to heterogeneous groups.

¹⁶Guthrie Birkhead, "Introduction", in Guthrie Birkhead (ed.), Administrative Problems in Pakistan, (Syracuse: Syracuse University Press, 1966), p. 13.

The academy seeks to weld probationers of divergent social, economic, and ethnic backgrounds into a corporate group with its own elan and sense of tradition. In this regard, some difficulties with respect to Bengalis and probationers from West Pakistan are invariably encountered with each new batch. Residence and common dining, of course, are required. Very few probationers are married. The one or two married men in each batch cannot live outside the academy and can visit with their wives only occasionally. The net result of these physical attributes and curriculum format is a matrix in which corporate elan and traditions are diffused with remarkable success. It is, perhaps, a tribute to this success that detractors of academy training claim that probationers after

completing the academy course no longer behave like Pakistanis.¹⁷

The academy curriculum includes daily horseback riding, language study, public administration, law, Islamic history and Philosophy, current affairs, and games.¹⁸ Recruits are also trained in social etiquette.

Probationers at the end of their training period must pass an examination before receiving an appointment in the Civil Service of Pakistan. Again, the examination is administered by the Central Public Service Commission, and each person is given four chances to pass, making failure unlikely. Upon passage, a recruit becomes eligible for appointment into the CSP, and to a high level government position. One interesting aspect of the training period, according to Braibanti is that "The CSP has been able to maintain its elitist quality probably more as a result of training at the Civil Service Academy than as a consequence of any other single factor or group of factors."¹⁹

¹⁷Braibanti, "The Higher Civil Service in Pakistan", op. cit., pp., 293-294.

¹⁸Goodnow, op. cit., 166-167.

¹⁹Braibanti, "The Higher Civil Service in Pakistan", op. cit., p. 298.

The CSP officers work their way up the administrative ladder in a regularized fashion. They begin at the district level in some capacity, primarily "learning the ropes." They then progress up to District Officer positions and then on to a secretariat position. From there, they may hope to become division commissioners or secretaries.²⁰

Promotion within the CSP is based almost exclusively on seniority. Once in the CSP, ability has little bearing on the positions a member may hold. This practice runs counter to the suggestions of all the existing administration and development literature on promotion, especially at upper level jobs.

The pay and benefits received by CSP members are very high. Within the public services there exists a wide difference in pay. This differential has been attacked in several of the research efforts on bureaucracy in Pakistan; but no effective action has taken place. Pay differences are based on service classes-- Class I officers receiving the most money and Class IV employees receiving the least amount. (See Table One) This wide differential in pay is a principal cause of dissatisfaction in the lower ranks of the public services.

²⁰Abramson, op. cit., p. 25.

TABLE

**Monthly Salaries of Selected Government
Personnel in 1958**

<u>Position</u>	<u>Monthly Salary In Rupees</u>
President of Pakistan	10,400
Provincial Governor	6,000
Chief Justice, Supreme Court	5,500
Secretary, Central Government	4,000
Director General of Health	3,000
Chairman, East Pakistan Public Service Commission	2,500
East Pakistan Director, Public Instruction	2,000
Director, General Statistical Office	1,700
Director, Advertising, Films, and Publica- tions	1,500
College Principal (President)	1,000
Psychologist, Federal Public Service Commission	900
Central Government, Assistant Secretary	800
Public Health Engineer	650
Superintendent (office), Central Secretariat	500
Stenographer	250
Clerk	150
Village Development Worker	100
Peon (messenger)	40

Source: Henry F. Goodnow, The Civil Service of Pakistan

The status and prestige afforded the members of the CSP is the highest in Pakistan. Its members are given privilege and recognition apart from the rest of the members of Pakistan's public services. This separateness tends to reinforce the elitist attitudes of the members. The members are basically Western in outlook and value systems, and they speak English and wear Western clothes.

The power of the CSP is derived through a variety of sources the enumeration of which is important for understanding the workings of the bureaucracy.

To begin with, most of the high ranking administrative positions are reserved for CSP members. At the same time, the bureaucracy is the most powerful aspect of the Pakistan government. The combination of these two gives the CSP a strong hand in decision making.

Goodnow identifies three characteristics of the structure of Pakistan which lend themselves to control by the CSP. These are: (1) the weak position of the provincial governments in what was labeled a "federal" government; (2) the absence of strong local governments; and (3) the role of the secretariats in adminis-

trative and policy decision making.²¹ The structure of the bureaucracy also contributes to the power of the CSP. The famous secretariat system is in use in Pakistan at the present time. This system is basically an organizational structure which consists of a level of offices between the department heads and the ministries.

Minister	-	Political Appointee
Secretariat	-	CSP Member
Department Head	-	Class I Officer

By staffing the secretariat positions with CSP officers, the CSP is in the position to influence all decision making and information flows.

The CSP and Development

There has been some concern expressed, in the literature on development administration, of the effects of the CSP on development programs. It has been pointed out that in the past when reforms in the personnel system were advanced, the CSP proved resistant to change.

²¹ Goodnow, op. cit., p. 115.

Albert Gorvine states;

The most frontal attempt to alter the power structure within the career services was led by the Pay and Services Commission which was chaired by the Chief Justice, the highest ranking CSP member in the nation....Among several proposals, the Commission recommended the unification of the disparate services into a seven-tiered structure. A Pakistan Administrative Service was suggested to replace the CSP and admit men of the technical services. Such a proposal, of course, deeply threatened the elite status and exclusiveness of the CSP, particularly the attack on its privileged system of earmarked jobs....

Naturally enough the CSP fought back. Two of the CSP members of the Commission wrote a dissent to the majority report: "We are of the opinion that the system which has stood the test of time, not only during the British regime but also during the tumultuous and important years since independence should be permitted to continue with such changes as experience has shown necessary." No changes were recommended by the dissenters. Their position prevailed, however, and the report was shelved by the government.²²

In a statement more directly related to development Henry Goodnow says;

²²Albert Gorvine, "Administrative Reform: Function of Political and Economic Change," in Birkhead, op. cit., p. 202.

There seems to be very little recognition by the CSP of the need for change....

The officers do not seem to grasp the tremendous magnitude of the job to be done in every department at every level of government if Pakistan is to become a modern nation....

Both the machinery of government and the attitudes of those who fill the higher positions seem better adapted to meet the problems of a previous era than the problems which confront Pakistan today....In short although the CSP officers are an intelligent and personable group of individuals, many of them lack a sense of urgency, a willingness to innovate and revise to meet changing needs, and a spirit of enthusiastic devotion to the nation's development program.²³

Implications for Agriculture

Agriculture is the largest single industry in Pakistan. It supplies approximately fifty per cent of its Gross National Product annually, and also supports eighty five per cent of its population.²⁴

²³Goodnow, op. cit., p. 230-40.

²⁴Agriculture Division U.S.A.I.D., Agriculture in Pakistan, 1966, pp. 6-7.

TABLE

Percentage Share of Major Sectors in the GNP

<u>Sector</u>	<u>1949-1950</u>	<u>1964-1965</u>
Agriculture	60.0	48.2
Manufacturing	5.8	11.5
Construction	1.0	4.7
Transportation and Communication	5.1	5.9
All Other	18.1	29.7

Source: Agriculture in Pakistan, p. 6.

The problems in agriculture are many and diverse. Increasing agricultural production has proven to be a formidable task even for the more advanced nations. In the developing states, the task is even greater. For good reason, a great deal of attention and many resources have been allocated to the problem of agriculture in the developing states. It is essential that the pay-offs from this be great. Myrdal underscores this by stating: "Fundamentally, it is in this sector (agri-

culture) that the battle for long-term economic development in South Asia will be won or lost."²⁵

Agriculture in Pakistan is characterized by small land holdings, primitive farming methods, underemployment, unemployment, and inefficient resource use. A short summary of rural Pakistan is provided in a U.S.A.I.D. report:

The general picture of rural life which emerges is of millions of poor farming families, grouped together in some 65,000 villages, cultivating their small farms by outmoded methods, and struggling hard to make a living and to improve their lot.²⁶

The goals of agricultural development can be listed as: (1) provide employment for the bulk of the population; (2) provide food for the population; and (3) provide raw materials for non-agricultural industries. Increased agricultural production also provides

²⁵Ibid., p. 5.

²⁶Gunnar Myrdal, An Asian Drama, (New York: Twentieth Century Fund, 1968), Vol. II., p. 1242.

higher incomes for farm families which is important for increasing consumption of manufactured goods. There is a clear interdependence between agriculture and industry.

In Pakistan the barriers to increasing agricultural production have been outlined by George Platt as follows:

The first is in the system for providing capital, the capital necessary for purchasing seeds, machinery, and new land and for improving or adding irrigation facilities. The second barrier is in the marketing system through which the farmer seeks maximum value for his crop but more likely only a small portion of its worth. A large profit goes to middlemen who control the marketing and often the credit system.²⁷

The first two barriers are primarily concerned with deficiencies in the economic framework. Platt goes

²⁷ George Platt, "Agriculture and Administration," in Birkhead, op. cit., pp. 92-93.

on to say:

The third obstacle is in the nature of the structure for providing education to the farmer and his children....

The fourth and final roadblock to development is in the general governmental structure surrounding the farmer, a bureaucracy embracing not only agricultural projects but all of the other points of contact between government and farmer.²³

Some of the most serious problems associated with agricultural development in Pakistan, thus, have to do with the personnel system. Development programs in agriculture depend heavily on the bureaucracy. Some of the most critical problems include (1) the supply of trained technical and administrative personnel; (2) the balance between specialists and generalists;

²³Ibid., p. 93.

(3) the development related attitudes of top administrators; (4) the position of the CSI in administration; and (5) the problem of employee transfers.

The Shortage of Personnel

The shortage of trained administrative and technical personnel is a serious problem in Pakistan as in most developing states. The shortage does not reflect a general shortage of manpower in the society; rather it reflects a shortage of educated personnel. It reflects the low literacy rate in the society. The National Planning Board of Pakistan in its list of organizational defects lists this problem: "Inadequacies of properly trained and experienced personnel (exists) in the development departments in the Centre and the Provinces."²⁹ The Third Five Year Plan states that "There are all-round shortages of qualified and properly trained personnel."³⁰ In relation to agricultural administration, the Revelle Report says that one of the most serious problems blocking agri-

²⁹M. A. Mannan, Economic Problems and Planning in Pakistan, (Lahore, W. Pakistan, Ferozsons Ltd., 1968), p. 26.

³⁰Planning Commission, Government of Pakistan, The Third Five Year Plan 1965-70, p. 161.

cultural development is the scarcity of technical, operation, and managerial skills.³¹ First, the literacy rate in Pakistan is very low--12%. This effectively eliminates the bulk of the population from the skilled job market. This means that each sector of the bureaucracy must compete for a scarce commodity--skilled manpower. Further, agriculture is a low prestige area of employment.

The government's agricultural program had little prestige and offered an unattractive career, with lower pay, prerequisites, power and responsibility than other fields....Most young men, contemplating their careers, would judge the priority given to agriculture not on the basis of the planning Commissions state-

³¹Roger Reville, White House-Department of Interior Panel on Waterlogging and Salinity in West Pakistan, Report on Land and Water Development in the Indus Plain, (Washington D. C.: The White House, January 1964), p. 183.

ments, but by the low pay and prestige actually accorded that profession.³²

The shortages in agriculture can be traced throughout the system. At the field level there is a shortage of agricultural assistants. Agricultural assistants are college graduates who perform extension work at the Union Council level.³³ The World Bank Study of West Pakistan noted that agricultural assistants are expected to cover areas ranging up to 60,000 acres without being supplied with proper transportation, proper housing, or other requisites.³⁴ The world bank study also notes a critical shortage of engineers:

The manpower bottleneck is more precisely a shortage of engineers.

The educational backlog can to

³²Gustav Papanek, Pakistan's Development, (Cambridge: Harvard University Press, 1967), p. 165.

³³Agriculture Division U.S.A.I.D./Lahore, Role of Nation Building Departments at the Union Council Level in SCARP-II-A, Concepts and Proposals, Mimeo-Pamphlet, (Lahore: U.S.A.I.D., No Date), p. 2.

³⁴Pieter Liefertinck, et. al. International Bank for Reconstruction and Development, Water and Power Resources of West Pakistan, (Baltimore: Johns Hopkins Press, 1968), p. 188.

some extent be alleviated by continued use of foreign contractors and consultants, but the number of engineers needed cannot be adequately supplied in this fashion; there can be no replacement for sufficient numbers of Pakistani engineers, permanently employed and experienced in local conditions.³⁵

The working conditions for agricultural personnel are extremely poor and this limits the attraction to agriculture. Papanek, in a quote, says, "Farming is a rather morbidly dirty business that has little appeal to the...poet civil-servant whose interests tend more toward an ever whiter shirt and a higher capacity air conditioner."³⁶ Working in villages away from the convenience of the city, being denied the status and prestige of a nice office and chauffeur, all contribute to driving people away from agricultural service.

³⁵ Ibid., p. 192.

³⁶ Papanek, op. cit., p. 145.

Also, Flatt argues that the discrimination against the specialist in Pakistan's bureaucracy contributes heavily to the shortage:

Pakistan inherited, and has since sharpened, a great differentiation between the generalist administrator and the disadvantage in terms of program influence, pay and prestige. Two detrimental results have been difficulty in recruiting competent young men for careers in agriculture and an impairment in the morale of agriculturists. Limitations in pay, prestige and prospects for advancement have worked against the upgrading of the quality of men in the agricultural services.³⁷

Generalists and Specialists

There is a split in Pakistan between the technical specialist and the administrative generalist.

³⁷Flatt, op. cit., p. 115.

This separation results from the policies inherited from the British tradition, and from the assumption that policy making can be separated from policy execution.³⁸ In terms of status and prestige, the specialists are always subordinate to the generalists. In recent years this situation has caused friction in the bureaucracy because the specialists are now beginning to feel they are being discriminated against unnecessarily. This is particularly true among the engineers. They have been applying pressure consistently on the government to do away with the long standing generalist preference.

The agricultural specialist, therefore, is low in terms of status and prestige. This has probably contributed heavily to the shortage of trained agriculturists.

Transfer Policy

The policy of the generalist services has been to rotate personnel from position to position. Abramson reports that bureaucratic problems are partially

³⁸This assumption was widely held by students of public administration until approximately 1950. For a discussion of this, see Paul F. Appleby, Policy and Administration, (University, Alabama: University of Alabama Press, 1949).

caused by "The indiscriminate and too frequent transfer of government officers, especially the higher civil services and particularly the CSP's."³⁹ Muneer Ahmad notes that the transfer policy works in two directions--both detrimental to the bureaucracy and the individual. First, there is the excessive transfer in which the generalist is moved from position to position without gaining in depth understanding of his job.⁴⁰ This is what Gladieux referred to when he said that the CSI officers had a breadth of experience, but not depth. Second, some officers in transferrable positions have not been transferred in years and who, according to Ahmad, have been allowed to sit on their jobs for an excessive amount of time.⁴¹

One result of frequent transfer is that it reduces the efficiency of all personnel. New personnel must be trained constantly and this takes up man hours which must be used for more productive activity.

Also, transfers involve costs for the individual. He must generally relocate, i.e. physically move his

³⁹ Abramson, op. cit., p. 25.

⁴⁰ Muneer Ahmad, op. cit., pp. 228-31.

⁴¹ Ibid., pp. 228-31.

family to a new location. Children must be placed in new schools. The individual has to adjust to new working conditions, and undergo a new training program.

Problems of skilled manpower availability, generalist dominance, and frequent transfers, may reduce the effective and efficient use of scarce resources-- in agriculture as in any other program areas.

SECTION FOUR

NEEDS FOR FURTHER RESEARCH

The preceding sections of this report have dealt briefly with some of the characteristics and problems of public administration in Pakistan. They have focused upon the organizational structure and the personnel systems, and have referred briefly to past studies of Pakistani public administration and the reforms which these studies have advanced. But to more accurately identify administrative problems and to make sensible and feasible recommendations, particularly as related to the improved management of water resources for agricultural production, much more work must be done.

First, more must be learned about the training, background, values, attitudes and behavior of specific sets of personnel. Answers are needed to such questions as, what decisions are made relative to water allocation, by whom, where, on the basis of what data and for what alleged purpose? What is the impact of these various decisions on actual water allocation and delivery and what, in turn, is the impact of this upon agricultural production and the

coordination of water use with other agricultural inputs? Who, in what positions, and in what departments, talks to the farmer, and about what, and what use is made of information feedback on on-farm problems and needs? What physical, financial, organization, cultural, and social and psychological factors facilitate or impede farmer-bureaucrat interaction and communication? What factors affect the propensity of bureaucrats to work with or avoid working with farmers. At what points and on what sorts of topics do line departments communicate one with the other--and what use is made of exchanged information? In short, a behavior and communication map of various sets of personnel in the water bureaucracy is needed.

Second, more knowledge is needed about the process for making decisions for the allocation and delivery of water to the farm. What are these decisions? Who makes them? And on what basis? What alternatives exist, are considered, accepted, rejected, and for what reasons? What physical, legal or cultural constraints preclude the selection of which alternatives? In short, more knowledge is needed as to the process of water allocation decision making.

Third, information is needed as to the nature of Pakistan's water law, and water allocation practices, whether they be in the form of custom, practice or written regulation. Knowledge is needed about relation of canal water to tubewell water; the legal implications of tubewell development; the machinery for the adjudication of legal disputes, especially relative to tubewell water; and the relation of the land tenure system to water allocation and use.

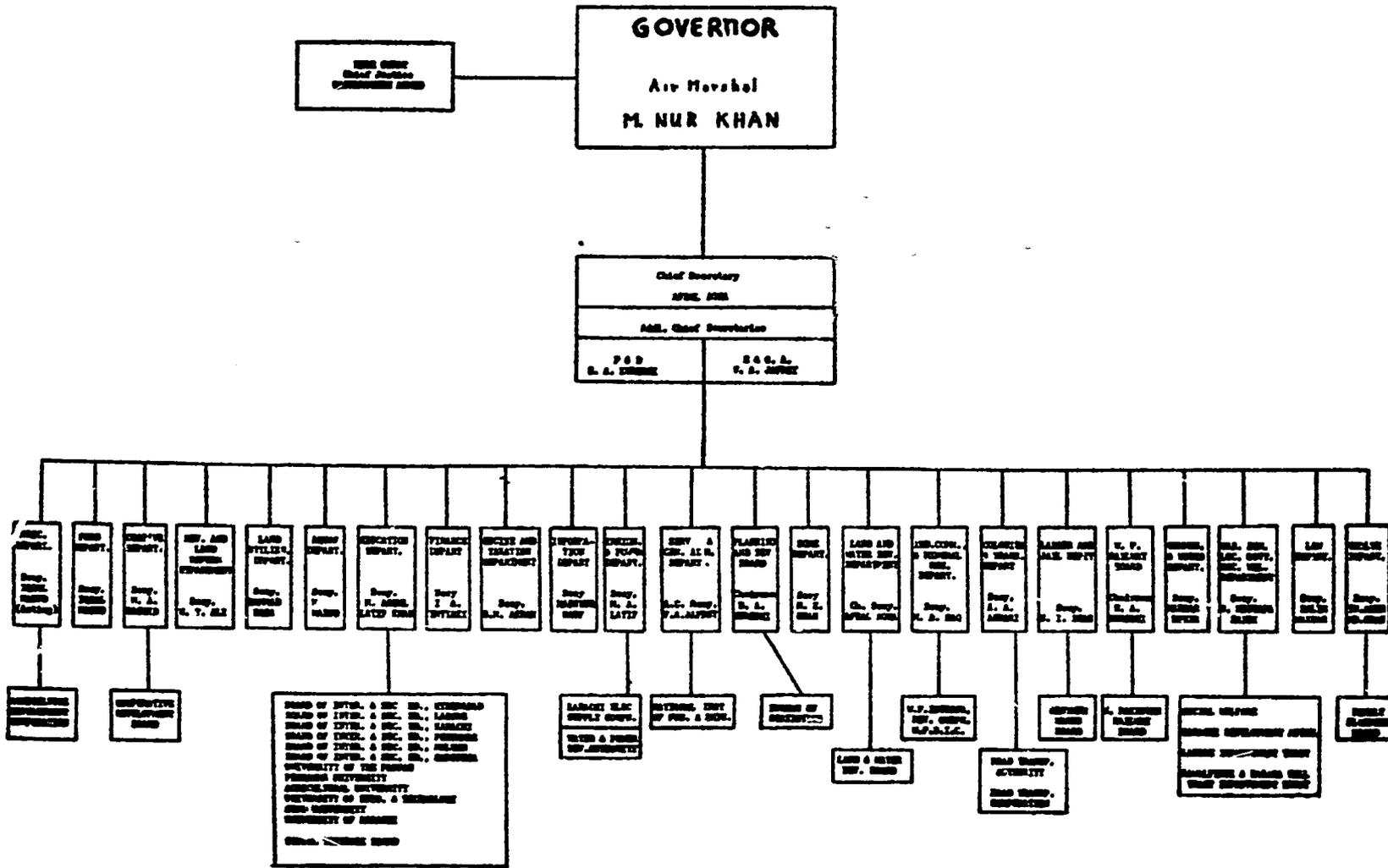
Fourth, study is needed of the relationships between existing and hypothesized market and credit systems on the one hand, and various hypothesized levels of increased agricultural production. What is needed in the way of improved market, transportation and credit systems must be met to achieve various levels of increased overall development?

Fifth, more should be known of the likely effects of advances in agricultural production upon both rural and urban employment, and about the capacity of the industrial sector to meet the mechanization needs of agriculture and to absorb displaced farm labor. Related to this is the impact of various levels of population growth upon agricultural advances.

What is needed ideally, of course, is a total systems analysis of Pakistan's development needs. The making of decisions about the allocation of very scarce resources would be greatly facilitated by information as to the likely outcome of various courses of action, and thus it is extremely important to know the effects of various forms of organization, markets, water law, and so forth, upon alternative resource commitment strategies. While time and financial constraints preclude such a systems approach, the obvious importance of the systems perspective must at least serve to warn us against an overly myopic concern with any narrow and single element or dimension of the problem of development generally and of water management specifically.

APPENDIX A

ORGANIZATION CHART GOVERNMENT OF WEST PAKISTAN



APPENDIX B

This appendix contains the progress report
and a statement of plans for 1970-71.

Progress Report

Work to date has involved:

(1) Collection and review of available secondary source materials on the Colorado State University campus.

(2) The generation of three Masters degree theses (two funded from this project, and one from other sources). One of these theses, dealing with the structure of the Pakistan water bureaucracy, has been completed. The target date for the others is June, 1970. These other two deal with (a) Pakistani personnel systems, and (b) factors related to the success of agricultural development programs.

(3) The drafting of a substantive report on the organizational structure for water management in West Pakistan. One chapter of this report remains to be edited.

(4) The design of our work for 1970-71.

(5) Attempts to establish working relations with Pakistani scholars and institutions. Working relations have been established with the University of the Punjab.

(6) The recruitment of additional personnel for the project. In this regard, Dr. Garth Jones will join our staff in a few months.

Plans for 1970-71

Our proposed plans for 1970 are sketched out in the CUSUSWASH proposal itself. Among the things we hope to do is to investigate the factors which affect the utilization of technological information in the water allocation and delivery decision-making system of West Pakistan. This problem is spelled out in more detail below.

The Problem

The general problem of concern in the entire CUSUSWASH research project is to generate information which will be of use in increasing food production in West Pakistan through the more efficient use of irrigation water, and through the coordination of the application of irrigation water with such other agricultural inputs as fertilizer, pesticides and seeds, and with land preparation. Thus, the value of much of the scientific information which will be

generated in this study hinges upon the capacity of the West Pakistan water system to produce decisions which will permit the flexible allocation and delivery of irrigation water and the coordination of the allocation and delivery with other inputs. If scientific information generated in the agronomy and engineering and other portions of this research are to be translated into actual increases in production, it is imperative that water application be closely coordinated with such other inputs as seeds, fertilizer and pesticides, as well as with land preparation.

The problem of concern to the political scientists is to seek ways to increase the probabilities that decisions can be made which will permit allocation, delivery and application of scarce water supplies in coordination with other agricultural inputs. Preliminary evidence suggests that water allocation and delivery decisions, many of which are made within the Irrigation Department, are made on the basis of considerations quite apart from the use of other agricultural inputs. A Harza engineer has noted, for example, that records

show that, historically, water diversion patterns often have had little relation to the evapotranspiration needs of crops. Thus, if these other inputs are to be of maximum utility, and if additional scientific and technological information generated in this and other research projects is to yield significant results in the way of increased agricultural production, then it is imperative that we identify the factors which act to rigidify the water allocation and delivery decision-making system, and seek politically, administratively and technically feasible means for changing that decision-making system.

Again, unless this is accomplished, unless means are devised to allow the coordination of water allocation and delivery with the application of seeds, fertilizer and pesticides as well as with land preparation and readiness, the resources invested in these other agricultural inputs, and in much of our research, may be wasted.

Purposes

The purposes of this research are, therefore:

- A. To assess the capacity of the West Pakistan water system to allocate irrigation water and to time water deliveries so as to make the close coordination of all agricultural inputs possible.
- B. To identify the factors which impede the making of water allocation and delivery decisions on a flexible basis so as to allow close coordination of water use with the application of other agricultural inputs.
- C. To hypothesize changes in the water allocation and delivery decision-making system which will allow greater flexibility and thus increase the possibilities of coordination.

Additional Discussion

The overall objectives of this research project, as stated in the Project Agreement, are to increase food production in West Pakistan through the improvement of water management practices and to optimize economic returns from limited water resources. More specifically, the Project Agreement enumerates these objectives:

1. Optimum uses of irrigation water from various sources such as canals, and tubewells, including saline water from tubewells, for increased agricultural production.
2. Optimum means to utilize ground water pumped by tubewells for agricultural production.
3. Preparation of land for more effective use of irrigation water.
4. Most effective timing and rate of application of irrigation water for various crops.
5. Improved seed bed preparation; ascertain the benefits of subsoil tillage as a means of improving root growth and increasing water use efficiency.
6. Design and construction of farm turnouts suitable to West Pakistan.
7. Means to control and measure the water delivered to the farm.
8. Organizational structure required for effective management and control of irrigation water; extent of participation of farmers.

9. Means to induce farmers and others associated with water management to make the changes necessary for most efficient use of irrigation water.
10. Integration of the various components of the water system of West Pakistan for increased agricultural production.

Our agricultural engineers propose studies to determine the amount of increased production which results from various alternative methods of land forming and water application and from various rates of water application. The agronomists propose experiments with water quality, rate and frequency of irrigation and alternate use of waters of different quality. They suggest that to determine optimum water use will require, among other things, appropriate and timely irrigation application. More specifically, they will conduct experiments with ground water as the only source, ground water mixed with canal water, ground water used only during seasonal canal water shortage, ground water applied at advancing stages of crop development, and ground water applied between intermittently scheduled canal water runs.

Information such as will be generated from the investigations described above can be of maximum use only if it is possible to alter the time of delivery and the quality of irrigation water. Thus, much of the potential value of this research hinges on the presumption that it will, in fact, be possible to adjust the rate and timing of delivery and the quality of irrigation water to the needs of soil conditions, land preparation and the application of seeds, fertilizer and pesticides.

But as noted earlier, there is evidence to suggest that at the present time such adjustments are not possible. It is imperative, thus, that the water allocation decision-making system be investigated, that impediments to flexible decision-making be identified and that technically, administratively and politically feasible strategies for change be hypothesized. It seems important, in other words, that study of soil-plant-water relations be linked with investigation of the water allocation decision system.

Procedures

Our initial task will be to specify the components of the water decision-making system, including the

farmer, the canal potwarii, and the Irrigation Department. This will involve identification and characterization of the decision-makers, the nature of the decisions which are made, the factors affecting decisional output and the impact of decisions on water allocation and delivery, as well as upon crop output.

With mission assistance one small segment of the canal system will be selected for investigation. Water flows will be traced from the headwaters, through the canal system and to the farm. The section of the canal system upon which we will focus will be one which leads to farm land which has reasonably high production potential. After tracing the flow of water, all points in the system at which decisions are made will be identified, as will the decision-makers themselves. Decisions made relative to water flow, diversion and quality will be identified, and their consequences specified. Constraining factors which affect each type of decision will be identified, as will various available decision alternatives. Constraints will probably include written regulations and orders, available information, other decisions

made both above and below each particular decision point, available water, demands for water, such physical characteristics of the system as canal and reservoir capacity, and others.

From this information it will be possible to identify the factors which may act to impede the capacity of decision-makers to allocate water on a strict demand basis. That is, we should then be better able to answer the question, "why is it not always possible to coordinate water application with the use of fertilizer, seeds, pesticides, and so forth?"

Alternative decision-making arrangements which would improve the coordinated use of all inputs will then be hypothesized, and the technical, political and administrative feasibility of each will be assessed. Throughout the study special attention will be given to the capacity of the decision system to make use of information fed back from farmers as to the time and nature of their water needs. That is, assessment will be made of the extent to which information relative to the time, quality and amount of water delivered to the farm is fed into the system. Attempts will be

made to identify the nature and causes of blockages in this communication system.

Additionally, an attempt will be made to design an ideal decision-making model--one which links the actors, in terms of communication and interaction, in such a way as to permit the most effective allocation of water. This model will be of use in identifying factors which reduce the optimum use of water.

(Once again, the principal payoff of this research is that it may increase the likelihood that discoveries made in such other areas as agricultural engineering, agronomy and economics will have maximum possible results in the way of increased agricultural production.

Anticipated Accomplishments

What we are able to do, of course, will depend upon available staff and funding resources. Ideally, however, we will do the following:

- (1) Someone from our staff--Dr. Garth Jones, very likely--will spend up to three months in Pakistan beginning late in the summer of 1970 establishing additional working relationships

with Pakistani scholars and institutions and, in cooperation with the mission, will select a site for investigation.

- (2) We will recruit several Pakistanis, from the Irrigation Department perhaps, to cooperate with us on this project and to come to Colorado State University for graduate work.
- (3) Bibliographic work already done and future bibliographic work will be used to produce an annotated bibliography for distribution in Pakistan and elsewhere.
- (4) The preliminary findings of this past year will be reworked for possible publication in such outlets as the NIPA journals in Lahore and Karachi.
- (5) Some of the better materials on water management in West Pakistan will be compiled for publication in the form of a reader. (This suggestion has had very favorable response from Leon Hesser.)
- (6) As is being done this year, a substantive year-end report of findings will be written and distributed.

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