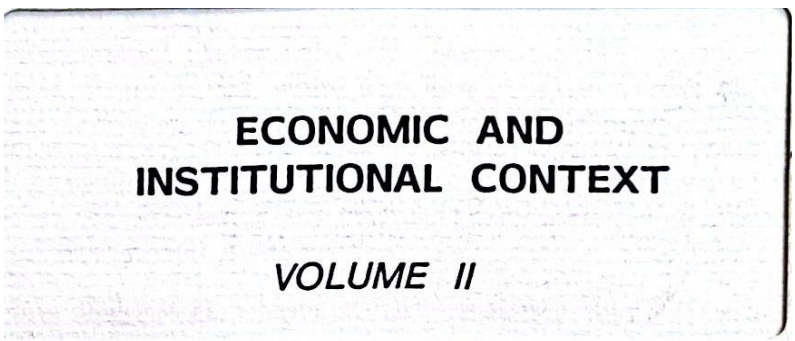
Master Plan for Barani Area Development



A Strategic Plan for the

Development of the Agriculture Sector

in Barani Areas,

Punjab, Pakistan

ECONOMIC AND INSTITUTIONAL CONTEXT

VOLUME II

April 1988

Development Alternatives, Inc.
Harza Engineering Company
National Engineering Services (Pakistan) Limited

PREFACE

The Master Plan for Barani Area Development was funded by the United Nations Development Programme (UNDP) and executed by the Asian Development Bank (ADB)under the auspices of the Department of Planning and Development of the Government of Punjab, Pakistan, and its Attached Department, the Agency for Barani Areas Development (ABAD).

This study formulates a long-term strategy for the agriculture sector for targeted barani areas in Punjab. The Master Plan report presents both a 20-year perspective plan for barani areas and a 5-year action program with proposed projects. The report is in four volumes: Master Plan (Volume I), Economic and Institutional Context (Volume II), Water Resources Development (Volume III), and Rainfed Agriculture Resources Development (Volume IV). The Master Planning Team has also submitted feasibility studies for two projects that were drawn from the analysis presented in the Master Plan: Potwar Integrated Agricultural Development Project and Riverain Development Project.

Two U.S.-based firms, Development Alternatives, Inc. (DAI), of Washington,D.C.,and Harza Engineering Company (Harza), of Chicago, Illinois, provided all international consultants for the study, drawn mainly from the firms' own professional staffs. The Planning Team was led by DAI President Donald R.Mickelwait and given major assistance by the Senior Vice President of Harza, John Priest.National Engineering Services (Pakistan) Limited (NESPAK), of Lahore,provided timely and highly professional local consultants for this assignment.

Survey support for economic and social analysis was provided by the Punjab Economic Research Institute (PERI), which undertook two special studies in support of the project.

The Master Planning Team is grateful to the Government of Punjab and affiliated agencies and institutes -- Planning and Development and ABAD, in particular -- the UNDP in Islamabad, and the ADB for their support, assistance, and contributions throughout the research. In the absence of this cooperation and sharing of information, the Master Plan could not have been completed.

Donald R. Mickelwait
Washington,D.C.
April 1988

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LIST OF ACRONYMS

ABAD	**Agency for Barani Areas Development**
Ac Ft	**Acre-Foot**
Ac	**Acre**
ADB	**Asian Development Bank**
ADBP	**Agricultural Development** Bank of **Pakistan**
ADP	**Annual** Development Programme
APM	Agricultural Produce Market Act
Aquifer	Water-bearing Strata
Arthi	Market Commission Agent
AU	Animal Units
AZRI	Arid Zone Research Institute
BAC	Barani Agricultural College
BADP	Barani Area Development Project
Bajra	Millet
Barchans	Crescent-shaped Dunes
BARI	Barani Agricultural Research Institute
Batai	Tenancy System
Bela	River Plain Land
Bhusa	Wheat Straw
BMP	Barani Master Plan
BPLRI	Barani Production Livestock Research Institute
Bunds	Dikes
CDA	Capital Development Authority
CDWP	Central Development Working Party
CFS	Cubic Feet per Second
Chowkidar	Guard
Chrysopogon	Range Grass
CIMMYT	International Center for the Improvement of Maize and Wheat
CMP	Crop Maximization Program
CMS	Cubic Meters per Second
Commandable (lands)	Lands That Can Be Irrigated by Gravity
CP	Crude Protein
CRBC	Chashma Right Bank Canal
Cunette	Small Lined Channel in Bottom of Larger Ditch or Waterway
DAI	Development Alternatives, Inc.
Darrah	Gullet,or Exit Point of a Stream or Hill Torrent from a Mountain
DFO	District Forest Officer
DG	Director General
DM	Dry Matter
Dofassli-dosala	Cropping Pattern with Two Crops in Two Years, a Rabi and a Kharif Crop, then a One-Year Fallow
Drawdown	Decline of Static Groundwater Piezometric Level as a Result of Pumping

ECNEC	Economic Committee of the National Economic Council
E1	Elevation
Equids	Horses, Donkeys,and Mules
Fauji Foundation	Army Foundation that Invests and Manages Retirement Funds
FDC	Fertilizer Development Corporation
FYP	Five-Year Plan
Gabion	Rock Bound in Wire "Bag"
Gandah	Water Control Structures Used in Piedmont Areas
GDP	Gross Domestic Product
GFR	Gross Farm Revenue
Ghee	Clarified Animal Fat
GPD/FT	Gallons per Day per Foot
GPM	Gallons per Minute
Gujara	Nomadic Herder from Azad Kashmir
Gullied	Water-worn Channels
GW	Groundwater
GWIP	Ground Water Investigation Project
Harza	Harza Engineering Company
HLLCS	High-Level Link Canal System
Hoqook	Lands Entitled to Receive Water in D.G. Khan Area
HYV	High-Yielding Variety
ICRISAT	International Center for Research on the Semi-Arid Tropics
IFAD	International Fund for Agricultural Development
IRR	Internal Rate of Return
Iso-salinity line	Line that Joins Points Where Salinity Levels are Equal
JICA	Japan International Cooperation Agency
Jowar	Sorghum
Kamarajah Rodkihis	see Gandah
Kankar	Calcareous Soil Nodule
Katcha	Ordinary
Kharif	Summer Cropping Season, July through September
Laths	Bunded Areas on Piedmont Lands of the Sulaiman Range
LBC	Left Bank Canal
LDA	Lahore Development Authority
Lepara	Land Close to the Village, Receives Manure
LLLCS	Low-Level Link Canal System
Loess	Aeolian Soil
Loess	Wind-blown Soil
LWT	Liveweight

M&I	**Municipal** and Industrial
MAF	Million Acre-Feet
Maira	Land Further from the Village, Receives Little or no Manure
Markaz	Subdivision of Tehsil
Masoor	Lentil, Lens culinaris
Mauza	Village
Mcal	Megacalories
MCM	Million Cubic Meters
ME	Metabolizable Energy
MGD	Million Gallons per Day
MNA	Member National Assembly
MPA	Member Provincial Assembly
MSL	Mean Sea Level
Mung	Mungbean,Vigna radiata,var.aureus
MW	Megawatt
NARC	National Agricultural Research Council
NEg	Net Energy for Gain
NEm	Net Energy for Maintenance
NESPAK	National Engineering Services (Pakistan) Limited
NF	Nonfarmers
NFM	NF Marketing
NFR	Net Farm Revenue
NRC	National Research Council
Nullah	Stream
NWFP	North West Frontier Province
ODA	Overseas Development Administration (U.K. aid-giving agency)
OFR	Off-Farm Revenue
OFWM	On-Farm Water Management
Outwash	Fluvial Deposits
P&D	Planning and Development Department
P&I	Planning and Investigations, WAPDA
Pachad	Piedmont
PADSC	Punjab Agriculture Development Supply Corporation
PARC	Pakistan Agricultural Research Council
Patti	Lowland between Dunes
Patwari	Recorder of Revenue Department
PC-1	Project Concept Paper Used to Clear Project in the Government
PDWP	Provincial Development Working Party
PERI	Punjab Economic Research Institute
PFD	Pakistan Forestry Department
PFI	Pakistan Forestry Institute
Phreatophytes	Grasses that Grow under Wet Conditions
Piedmont	Flat Land at the Base of the Range
Planimetrical	Horizontal
PLUA	Punjab Land Utilization Authority
PMU	Project Management Unit
POL	Petroleum, Oil, and Lubricants

PPM	Parts per Million
PSC	Punjab Seed Corporation
Rabi	Winter Cropping Season, October through April
Rakh	Government Forest Land
Rape	Mustard, Brassica sp.
Rs	Rupees
Sads	see Ganda
Sahiwal	Breed of Cattle
Sailab(a)	Land that Depends on Seepage Water or River Floods Chiefs
Sardars	Soil Conservation Directorate
SCD	Communally Owned Land
Shamlat	Plank for Leveling Land
Sohaga	Square Miles
Sq Mi	Square Kilometers
Sq Km	Soil Survey of Pakistan
SSP	Cereal Crop Residues
Stovers	Climate between Humid and Arid
Subhumid	
Taramira	Eruca sativa,rocket
TDS	Total Dissolved Solids
Tehsil	Political Subunit of a District
Transmissivity	Property of Aquifer to Transmit Water Expressed Numerically
Tubewell	Vertical Drilled Well with Circular Casing and Screen
TVC	Total Variable Costs
USAID	United States Agency for International Development
Wahs	Stream
Wakras	see Gandah
WAPDA	Water and Power Development Authority
WASID	Water and Soil Investigation Division
Watbundi	Field Border Construction
Zilla	Regional Political Unit in Pakistan

INTRODUCTION

Interrelated agricultural production systems in baraniareas cannot be understood in isolation from their social, economic, and institutional context. The social and economic context defines the parameters of successful interventions into existing production systems. The institutional context delimits the solutions possible for barani development, which must be approved and supported by government agencies and departments.

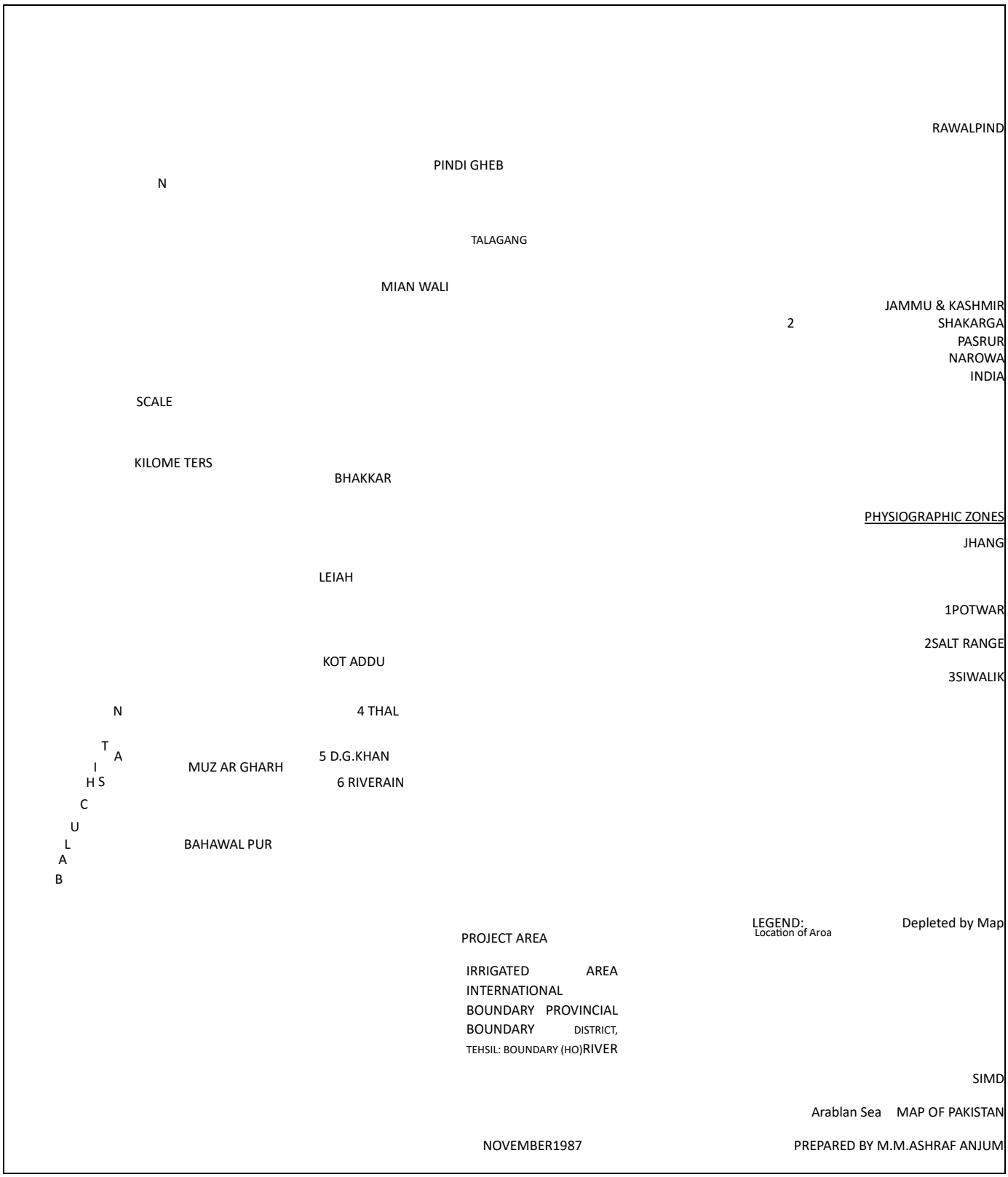
The first of the following two chapters examines the social, economic, and human resources dimensions of barani development. It establishes the land, labor,and capital relationships of barani agricultural production. Drawing on secondary source data and specially commissioned field surveys, the analysis outlines the special requirements of any barani development project that intends to change the production behavior of small farm units.

The second chapter examines the institutional context for barani development,past, present, and as proposed for the future. If barani development is driven by multisectoral integrated projects, based upon the whole-farm analysis of production possibilities, as the Master Plan concludes, the special institutions that plan for,oversee, direct, and implement multisectoral projects are critical to success. The institutional framework is examined, and recommendations are proposed to rehabilitate and strengthen the planning and the execution departments, agencies, and authorities engaged in barani development.

It is only in the broader context of the barani tract that alternatives for agricultural development can be examined and realistically evaluated. This volume of the Master Plan sets the stage for a more detailed analysis of water resources development and rainfed agriculture resources development, which will follow in Volumes III and IV.

EXHIBIT i

PUNJAB BARANI TRACT
ZONAL BOUNDARIES



CHAPTER ONE

THE ECONOMIC CONTEXT FOR BARANI DEVELOPMENT:
SECTORAL EVALUATION OF BARANI AGRICULTURE

INTRODUCTION

The purpose of the economic portion of the Barani Master Plan is fourfold.First, it is an attempt to review and analyze the performance of the agricultural sector in the barani economy -- which comprises 90 percent of the economic activity of the region -- since the advent of the Green Revolution in the late 1960s.Second, the source and distribution of income in the sector will be examined and accounted for. Third, building upon the second, the probable effects on the economy of interventions in agricultural production will be examined. Finally, in the summing up, recommendations will be made regarding the technical configuration that interventions may take.

The practical problems that adversely affect the performance of economic research using secondary sources in the barani are discussed in Appendix A to Volume I. The information required by the economist is not produced in a form that can be translated to conform to the dry-land agriculture zones of the barani, many of which cut across administrative boundaries, which form the basic census-collection units. The economist must fall back upon the use of proxies. Two proxies are used here. First, wheat, which is seen to be a good surrogate for crops in general, is used. So dominant is the crop that its fortunes can be said to be identical to those of the barani farmer, at least those north of Thal. Second, the Potwar is used as a prototype zone because of the close fit between Potwar and rainfed barani lands.The Potwar includes the districts of Attock, Chakwal, and Rawalpindi. When particular divergences occur, they are pointed out and discussed. Sections having to do with agricultural policies draw heavily upon the Report of the National Commission on Agriculture, released in November 1987, by the Government of Pakistan.

The barani tract can be regarded as a challenging new agricultural frontier with a promising economic future or, alternatively, as a difficult and dependent stepchild.Through the years the Government of Pakistan has to varying degrees been deeply involved in the management of the agricultural sector. It has not, however,treated the barani differently from the rest of the Punjab、

Government policies since the early 1960s have represented attempts to promote agricultural and industrial -- and urban -- growth. The Green Revolution,which occurred in the late 1960s and much of the 1970s, was a period during which technology worked to offset earlier policies and comparative prosperity in agriculture was realized. The government, through the years, attempted to control prices of the principal crops, providing farmers sufficient incentive to produce, on the one hand, while keeping the prices of essentials within reach of the lowest-income groups in urban areas on the other. Prices of wheat, rice, cane, and cotton were controlled by means of procurement programs. Consumer prices of sugar were set below international price levels, and the consumption of vegetable oils was subsidized.

Input prices included a subsidy element for the supply of water, fertilizer, and plant-protection materials. The government was also an active participant in the import,distribution, and domestic production of inputs, including fertilizers, pesticides,tractors and equipment, and tubewell components.

The barani benefited from these programs to the extent that its farmers used fertilizer, had access to sources of water -- essenially minidams, small dams, lift pumps, and tubewells -- or the capital to obtain tractors or their services when needed. In practice, many farmers, in particular the smaller operators and tenants,did not -- and still do not -- have access to these programs.

In 1980 the Government of Pakistan introduced a new agricultural policy,the key elements of which included:

An adjustment of input and product prices to reflect real resource costs;

The eventual phasing out of subsidies;

· A gradual transfer of certain activities from the public sector to the private;and

Making full use of existing projects rather than continuing to expand irrigation works, at a time when budgets for recurrent costs were under great strain.

This agricultural policy was implemented during the latter part of the fifth plan (1979-83) and has remained a guideline through the sixth (1984-88).

Since the introduction of the 1980 policy, subsidies on pesticides have been eliminated in Punjab. Fertilizer prices have been raised to a point at which they are comparable to 1987 world prices, as a result of a phased reduction of the subsidy element, subsidies continue, however, for phosphatic fertilizer. Both the import and distribution of inputs are less controlled by the government than formerly. The beneficiaries are paying an ever greater share of total water charges. Crop prices have been raised, for the most part, to bring them into line with world prices. At present, only sugar and oil seeds are still seriously underpriced. Investments have been made in the maintenance of the irrigation system and for the drainage of waterlogged and saline areas. A start has been made, as well, to improve agricultural research and extension, increase the supply of seeds and of high-yielding varieties, and provide more and better credit facilities and rural roads, all of which had been neglected.

The achievement of goals in the Sixth Five-Year Plan has been heavily dependent upon performance in agriculture. The plan continues the essential thrust of the 1980 policy reform, but certain new elements have been added. Extension activities in the private sector are being encouraged. Farm mechanization is being promoted, stressing the introduction of machinery thought to be suitable for use on small farms. Although price distortions remain and the sector remains unprofitable,new emphasis has been given the development of oil seeds to reduce imports. The objective of the plan is to move agriculture from self-sufficiency to a commercial basis directed toward both domestic and export markets.

The yet-to-be-published seventh plan (1989-1993), which will stress the modernization of agriculture, will build upon the supposition that the 1980agricultural policy has been largely implemented.1 In the future, the government will not choose to lead, but will instead support rural and agricultural development --providing institutional and supporting functions, because it no longer wishes to be seen as a first source of investment capital and initiatives. Whereas the government favors development of high-value crops and enterprises in the barani, such as fruit,vegetables, oil seeds and meat, the planners expected that these will develop largely in private hands. A completely changed market situation for oil séeds, in which the government will buy oil, rather than seed, at prices that will provide an incentive to local producers, is anticipated. The seventh plan reflects an emphasis on the crops and animal products in which the barani has a comparative advantage, such as oil seeds and meat.

POPULATION

To be counted an inhabitant of the barani is to be considered a member of a fairly exclusive club.2 The problem begins with the definition of the barani itself.For the purpose of this exercise, a baranian is a person who lives in a rain-dependent rural area contained within a cluster of administrative boundaries --districts and tehsils --- which have been decreed to be barani -- that is, essentially rain-dependent--areas.

The barani population continues to grow at an estimated annual rate of 2.2percent net of migration, low compared with the remainder of Punjab Province, 2.7percent, and with all of Pakistan, 3.1 percent. The total barani population in 1987was calculated to be 9,627,000, the rural component of which was estimated to be 7,194,000; the barani population is growing more slowly than the rural population generally, which has averaged 2.6 percent annual growth since 1951.

Although the rate of population growth in the barani is relatively low, between the 1951 census and 1981 it accelerated from 1.6 percent annually to 2.2 percent.Considerable variation is to be found among districts and tehsils. Some of the highest figures -- Mankera Tehsil (Bhakkar District), 4.29 percent, and Dera Ghazi Khan, 3.83 percent. At the opposite extreme are Gujar Khan Tehsil, Rawalpindi; Isa Khel Tehsil, Mianwali; and Shakargarh Tehsil, Siwalik, grow at a leisurely 0.4percent.

District growth rates cannot be explained by substantial levels of out-migration. While migration, both into and out of the barani, is an important feature,the two flows cancel each other: the net figure for the decade is 65,000, outward bound. Approximately 9.7 percent of the barani population has relocated itself, a

1This section includes information obtained from an interview with Sartaj Aziz,Advisor to the President for Food, Agriculture, and Cooperatives.

2The supporting tables for this section will be found in Appendix A, Volume I,of the Master Plan.

movement largely of rural people. Immigrants into the barani areas, most of whom go to cities, have entered at a rate of 9.2 percent. The census does not provide the age distribution of emigrants, but other evidence suggests that it is heavily concentrated among young male adults. Women appear to remain at the homestead until permanent relocation takes place.

The population in the barani is heavily rural, 75 percent, but this is not much higher than in the Punjab as a whole. Some districts, Bhakkar and Leiah, are 100percent rural; Rajanpur, Khushab, and Chakwal are more than 90 percent. The tract is less densely populated than Punjab, 173 persons per square kilometer versus 186,but significant variations occur: 793 per square kilometer in Sialkot Tehsil, but only 32 per square kilometer in Chaubara Tehsil.

One of the striking characteristics of the rainfed barani areas of Punjab is the lack of urban concentrations greater than what would be called a large town. An important exception is the Rawalpindi-Islamabad complex, set at the northern edge of the barani. This agglomeration attracts the bulk of the net inflow of migrants as well as residents of neighboring areas.

THE ECONOMIC CONTEXT FOR BARANI AGRICULTURE: **SELECTED TOPICS**

For the present analysis, widely held anecdotal assumptions that the barani is an area in economic decline or, at best, stagnation were taken as the starting point.Its young population was said to be leaving, its farms relegated to marginal status,with limited investment opportunities. Government planners believed that barani farms are unproductive because they practice essentially a subsistence form of agriculture and typically produce little or no surplus. Furthermore, technology seemed to be backward and was likely to remain that way.

The following parts of the economic section present a wide variety of information that may provide an implicit test of these beliefs. In the conclusion, an appraisal of the barani economy and its outlook will be attempted. In addition, an economic assessment of the implications for barani agriculture of a large-scale wheat intervention in crop production will be offered. The effects of the intervention will be followed from production through to income and consumption to employment. A brief look at the effect on crop programs of an increase in dairy herds and oil-seed production will also be taken.

Transfers of Net Income into the Barani

The barani is a subregion of a province of Pakistan, and as such it does not produce figures that permit calculation of a subregional product.3 To the extent _____

3Pakistan prepares its national income statistics from the top; intermediate materials that reflect the economic performance of provinces and lesser levels do not exist.

that a national barani product has meaning, it is important to bear in mind that the rainfed lands sustain virtually no other economic sector. More than 90 percent of the population is engaged in agriculture, either as operators or as laborers. A very small service sector exists, while practically no processing is undertaken. Farm emigrants who seek higher incomes must leave the sector and the barani. The economic progress of the barani is almost identical to that of wheat producers, which in recent decades has meant the progress of the Green Revolution.

The Green Revolution -- a wheat seed, fertilizer, water package -- came to western Punjab in 1965. High-yielding varieties (HIYV) of wheat appear to have become important in irrigated areas during the mid 1970s and only significant in the dry "barani" during the late 1970s. During this period the production incentive was particularly strong in the case of wheat, and the new varieties spread to the limit of their comparative technical advantage.

The advent of a broad-based improved production technology put barani -- and Pakistani -- agriculture in such a favorable relative income position that the government subsequently found it desirable to tilt the terms of trade somewhat against the sector through implicit taxation: stabilizing prices for wheat -- among other selected products -- for a number of years,letting inflation reduce their real value while increasing prices of inputs and removing subsidies.4 These were used in lieu of direct agricultural taxation. Input prices were allowed to rise in relation to output prices, the currency remained overvalued, and specific export taxes were applied.Furthermore, selected water charges were increased, and a mandatory procurement system was instituted for wheat and other leading crops.

A comparison of the ratios of wholesale price indexes for agricultural products with the wholesale price index for manufactured goods purchased by agriculture--and thus as "imports" into the barani -- provides an indication of whether a net transfer of income into or out of the barani during a particular period has taken place.5 Using 1970 as the base year, the wheat-manufactures price index, in the early 1980s,showed wheat only marginally above equality -- 105 on an average. This may have occurred because adverse years in the 1980s and the withdrawal of the fertilizer subsidy put an upward pressure on prices. Rice, a less important crop over all, in particular for smaller farmers, did somewhat better, having a favorable average ratio of 114 throughout most of the decade, and the average ratio of cotton was 144. Producers of livestock for meat did very well also, having a ratio of 130for the past decade.

On the whole, the past 15 years have been good ones for agriculture. The agricultural sector has been able to provide reasonable levels of income to barani farmers able to buy into the new technology. The benefits have not been distributed equitably for a number of reasons, which will be explored in the following sections,and the subsistence agriculture subsector in particular, according to the recently _____

During this period impressive growth was recorded nationally in cotton,sugarcane,and rice as well as in wheat.

5 Strategies for Economic Growth and Development The Bank's Role in Pakistan, tables 21 and 22, appendix 3.1 (Manila: Asian Development Bank, 1986).

released Report of the National Commission on Agriculture, has been unable to participate fully.

Trends in **the Production of** Wheat since the Advent of the New Varieties

The Green Revolution came later to the barani lands than to the irrigated parts of the Punjab. Wheat remains the principal subsistence crop, but farmers grow surpluses beyond their home needs, and commercial sales have become locally important. In 1986, the Potwar alone produced more than 50 percent of the rainfed wheat of the province.

Additional production has come primarily from the use of fertilizer on the rainfed lands. During the decade 1975-1985, wheat production grew at a rate of 5percent a year in the Potwar, and yields grew nearly 9 percent, while the area planted in wheat declined 3.6 percent! Inasmuch as HYV seeds were probably scarce and there were no significant shifts in cropping patterns, it seems reasonable to conclude that the use of fertilizer was responsible for much of the increment. A large proportion of the acreage planted in wheat in 1980 was still planted in traditional (desi) varieties -- 69 percent of the area planted in wheat in Rawalpindi and 87 percent of that in Jhelum and Attock.6 Similarly, the average levels of application of fertilizer remain well below recommended dosages. In 1980,in low-rainfall areas of the barani, farmers applied less than half the recommended dosages,in higher rainfall areas less than a third.7 There is reason to believe that this level has risen considerably. In their recently completed study, PERI staff found every respondent to be a user of fertilizer.

The local varieties in the barani only respond to low doses of fertilizer, while desi varieties grown under irrigated conditions do not provide an economic response to higher applications of fertilizer and have a tendency to lodge. Desi varieties have persisted because of their late planting date -- important in the overall crop program -- the importance of their long straw as animal feed, and consumer preferences for that variety. Desi varieties can also be planted more deeply, to reach moisture that HYV cannot reach. Even where suitable varieties exist, an absolute lack of seed remains a problem. Farmers must grow their own. Farm-grown seed stock of the HYV seed, however, degenerates in time because of admixture with other seeds--weeds, other varieties -- disease build-up, and so on.

The wheat revolution, nourished in part by cheap fertilizer, made wheat an important source of income to farmers, especially during the 1970s. A comparison of two indexes -- producer prices of wheat and the retail price of fertilizer -- since 1974 reveals a steadily rising coefficient until the time that fertilizer subsidies began to be phased out, raising retail prices of fertilizer. During that period the price of wheat rose more rapidly than the price of fertilizer, producing the following coefficients: 1975,1.06;1976,1.13;1977,1.14;1978,1.52;1979,1.58;1980,1.51._____

6 Calculations made from information that appears in the 1980 Census of Agriculture.

7 Technical information regarding the spread and pattern of adoption of HYV and fertilizer has been collected by the CIMMYT South Asian Maize and Wheat Program since 1983.

When subsidies began to decline the ratio changed sharply: 1981,1.17;1982,1.09--with prices deflated to 1960 - 100.8 Since 1981, fertilizer prices have continued to rise, and the subsidy has been largely phased out for nitrogenous fertilizers, while wheat prices have risen at a comparatively low rate -- 3.9 percent a year.

Taxes and Subsidies9

The relative prosperity of agriculture during the past 15 years, however, has to be seen against a background of systematic indirect taxation, the effect of which has been to remove much of the apparent gain. Direct taxation of agriculture is light in Pakistan; indirect taxation, however, is quite heavy.

There is great political resistance to the idea of direct taxation of agricultural incomes, which the government has sidestepped by levying religiously sanctioned taxes that include farmers. Since 1982 the government has collected an Islamic tax,ushur, which must be paid by every Muslim landowner except those whose produce is less than 948 kilograms of wheat or another crop of equivalent value. Only about 16percent of the amount due is said to be actually collected, because the assessment tends to favor the farmer. A second tax, zakat, which is a form of income tax,is levied at a rate of 2.5 percent. A third and steeper tax is the local land assessment,which has a long historic standing. The land revenue is a tax levied in direct proportion to landholdings, with the first 12 acres exempt and progressive increases thereafter. An additional direct tax exists, iqra, which probably has only limited effect in the barani. This tax,levied to pay for Islamic and Koranic teaching,is assessed by adding 5 percent to the irrigation water rate.

In Pakistan as a whole, in 1983-1984, revenues from land taxes amounted to 67percent of total direct taxes on agriculture in value, ushur, 32 percent, and the income tax, 1 percent.10 The total value of land revenue collected in the barani in 1985-1986 was 5.3 million rupees, while ushur brought in 28.2 million rupees.

More important is the maze of indirect taxes that affect agriculture and in sum represent a considerable net transfer of resources to the urban and industrial sectors. These taxes include:

· Import duties on agricultural inputs;11

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8 Strategies for Economic Growth and Development, the Bank's Role in Pakistan, Table 27, Annex 3.1 (Manila: Asian Development Bank, July 1986).

9Much of the information for this section is taken from the Report of the National Commission on Agriculture, chapters 5 and 29.

10PIDE Research Report No. 146 (1985), and Agricultural Statistics of Pakistan (1985).

11Buyers of imported tractors, for example, must pay about 20 percent effective duty -- 10 percent tariff plus a surcharge -- according to the Agricultural Development Bank of Pakistan.

· Sales taxes on products of agricultural origin;

Export excise taxes, which have the effect of depressing farm prices;and

Import subsidies on goods that compete directly with (in the present instance) barani products such as oil seeds, milk powder, and wheat; these also depress farm prices.

In addition, there are various surcharges on some agricultural products and there is a long history of price interventions in foodstuffs that are designed to protect urban consumers. In 1983-1984, the incidence of agricultural taxation per hectare was as follows: direct, Rs 21.96; commodity, Rs 47.62; indirect, Rs 910.71; and total incidence, Rs 980.29. The total agricultural tax equals 32 percent of the value added in the sector.12

The cumulative burden of these imposts on agriculture has not been smnall.The "taxation" of the agriculture sector through the exchange-rate mechanism has historically been high, from around 50 percent in 1960-1961 to 60 percent in 1971,33percent in 1981, and about 21 percent in 1987. The rupee continues to be overvalued, but it is much closer to its market value now than in the 1960s.

Fertilizer subsidies, formerly important, have now been phased out for nitrogen but persist at a reduced rate -- 29 percent -- for phosphate. There are no current subsidies for plant protection materials. The Soil Conservation Organization of the Punjab Department of Agriculture provides special support to assist barani farmers.Land leveling, for example, is subsidized, a third of the cost being paid by the government. Afforestation projects receive a subsidy of 100 percent, while 50percent is allowed for the construction of outlets, spillways, and so forth. Half the price of minidams is paid under the same program. Part of the cost of installing tubewells is through a subsidy -- Rs 20,000 in barani areas. Lift pumps are sold to farmers with a subsidy of 50 percent. By 1986 nearly 12,000 tubewells and more than 2,000 lift pumps had been supplied to farmers under this program. Should the well, when drilled, prove to be dry, no charge is made.

Changes in Access to Land in the Barani

Farm Size

The size of a farm affects its efficiency in the use of resources, the amount of income it can generate, and the potential technical innovations that it can adopt Small low-income farmers are unlikely to possess farms of sufficient size that investment in technological improvements such as tubewells and tractors is economically justified, nor do they have enough of a resource base to generate excess income that can be saved for the capital investments required to make significant improvements in their systems.

12PIDE,op cit.

Access to land is a fundamental measure of well-being -- a promise of support when all else fails. In an era when new technologies beckon to increase returns on land, owners dream of having more. Ownership of land carries a special status, even if the land is not economically viable, as when a farm is too small to support a family. This is most often the case with farms in the barani areas; thus, land in the barani, its ownership still widely shared among many, has not remained the assurance of family security it once was. Landlessness, although it does not necessarily mean poverty, denies barani residents the automatic status of landholder, no matter how mean the actual size of holding. Perhaps a third of the barani population are landless; the exact figure is unknown. This group includes, in addition to a mass of laborers, artisans -- cobblers and cordwainers, carpenters and potters, blacksmiths and tinkers, bakers, well diggers, brickmakers, metalworkers, wheelwrights--together with mullahs and many shopkeepers and other traders. The traditional bogeyman, the moneylender, usually Hindu, appears to have vanished with partition.

The progress of rural land stress can be measured indirectly through farm statistics. Farms have gradually become more numerous and smaller. Since 1972 the average farm size has declined at overall rates considerably in excess of natural population growth (Table I-1). Declines have ranged from 23 percent in Khushab and Attock, to 10-12 percent in Chakwal and Gujrat, to almost none or none at all in Jhelum, D.G. Khan, Mianwali, and Rawalpindi. For the most part, these declines represent falls from averages that are already small, given the number of persons dependent on each acre and the fickleness of rain (Exhibit I-1).

One study of the differences between the percentages of farms in different area classifications and the percentages of land in different farm scales is illuminating (Tables I-2 and I-3 and Exhibits I-2, I-3, and I-4). Three factors were considered:the number of farms of different scale, the area of farm land associated with each scale, and the changes in these since 1972. There has been a distinct downward shift in.average farm size as more small farms have appeared and large ones have disappeared. At the same time, land, which is seriously maldistributed, has been redistributed downward somewhat.

There are a large number of very small farms. The National Commission on Agriculture classifies all national barani farms having less than 25 acres as small, a classification that embraces about 90 percent of all the farms in the Punjab barani,as shown in Table I-2 and Exhibit I-2. Because the group of small farms is too large, it must be presented separately for analysis of it to have any meaning. Some,as will be shown subsequently, are viable farm operations, in that farm families can subsist in the absence of other incomes, while others are not. At the extreme lower end are found plots of land of less than 2.5 acres, which can only exceptionally be called farms. Such farms would have to have access to water and grow at least two seasons of high-value crops annually to provide enough money to buy the staple food required to support a family. In 1980, nearly 20 percent of these farms were in operation on just 2 percent of the land. The land distribution is shown in Table I-3and Exhibit I-3. The vast majority of small farms belong to the 2.5-5.0-acre category. Farmers who own this land have great difficulty making a living. Thus,35 percent of barani farms, which occupy just 7 percent of the cropped land, are under great income stress, and their owners must seek off-farm income. The small farms among the upper third of the barani farms -- say larger than 15 acres -- if on good land and in a relatively high rainfall barani area, can probably produce a fair living.

EXHIBIT I-1

Average Farm Size in Selected Barani Districts, 1972 and 1980

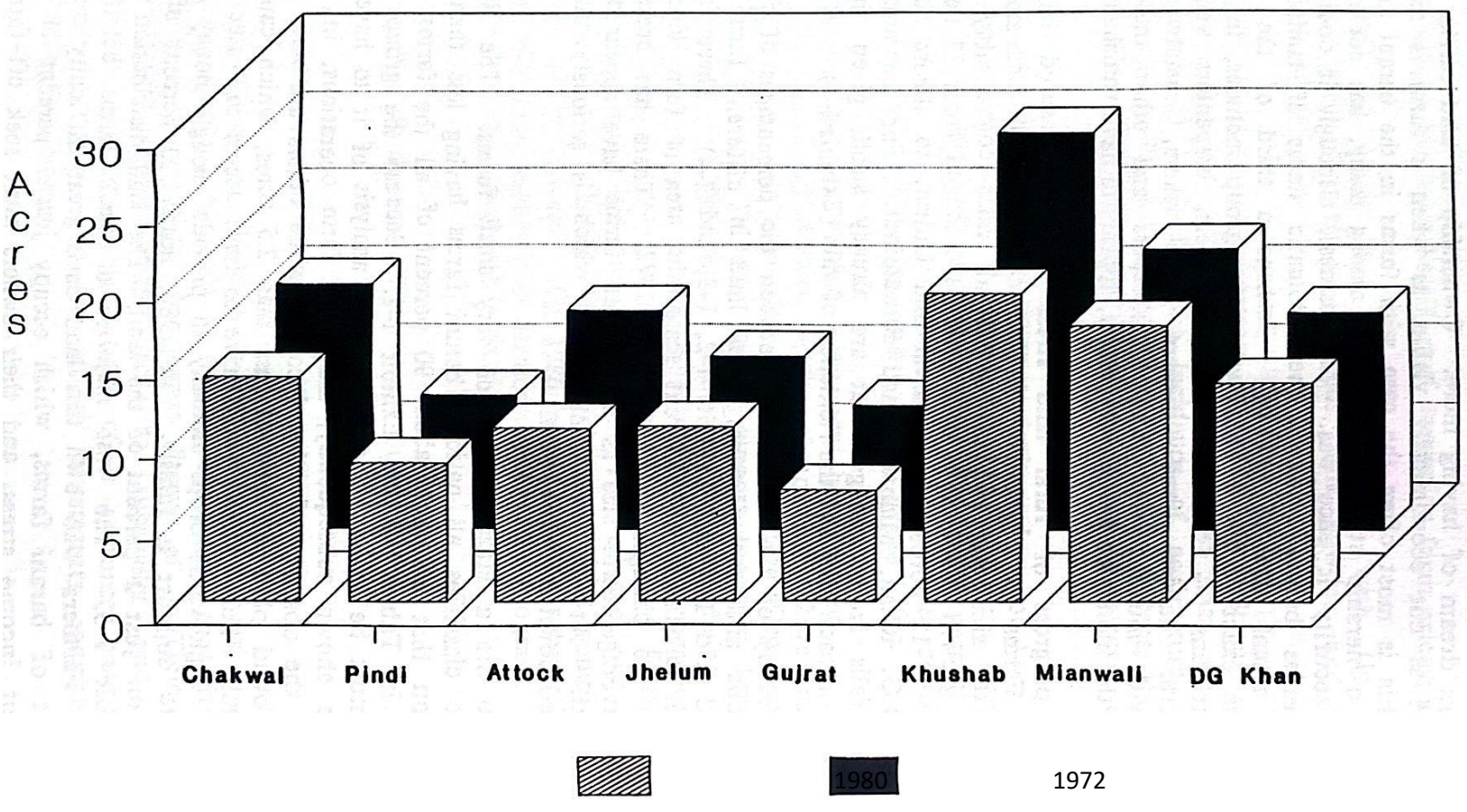
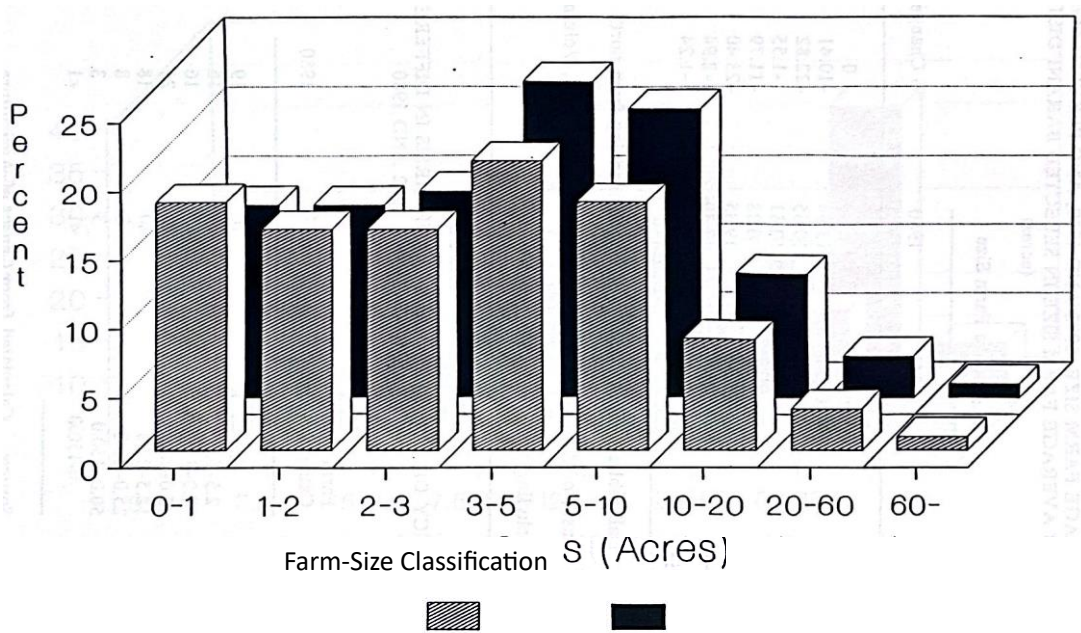


EXHIBIT 1-2

Frequency Distribution of Farms,
by Farm-Size Classification, 1972 & 1980



March 1988

1980 1972

TABLE I-1

AVERAGE FARM SIZE, 1972 AND 1980, AND PERCENTAGE CHANGE IN AVERAGE FARM SIZE IN SELECTED BARANI DISTRICTS (acres)

Districts	Average Farm Size 1972	1980	% Change
Rawalpindia	8.43	8.43	0
Chakwal	15.56	13.94	-10.41
Attock	13.80	10.65	-22.82
Jhelum	10.98	10.81	-1.55
Gujrat	7.88	6.88	-11.79
Khushab	25.26	19.35	-23.40
Mianwali	17.79	17.30	-2.94
D.G.Khan	13.72	13.55	-1.24

Note: In all tables districts appear in an order running from north to south.

Source: Census of Agriculture, 1972, Volume Five, and 1980, Volume Three.

Excluding Murree and Kahuta tehsils.

TABLE I-2

FREQUENCY DISTRIBUTION OF BARANI FARMIS IN DIFFERENT FARM-SIZE CLASSIFICATIONS,1972 AND 1980 (percent)

Category (acres)	Farm Size 1972	1980
<2.5	16	19
2.5-5.0	15	16
5.0-7.5	15	16
5.0-12.5	23	21
12.5-25.0	20	18
25.0-50.0	8	8
50.0-150.0	3	3
>150.0	<1	<1

Source: Calculated from Census of Agriculture, 1972, Volume One, and Census of Agriculture, 1980, Volume Two.

EXHIBIT I-3

Proportion of the Barani Area in Each

Farm-Size Classification, 1972 and 1980

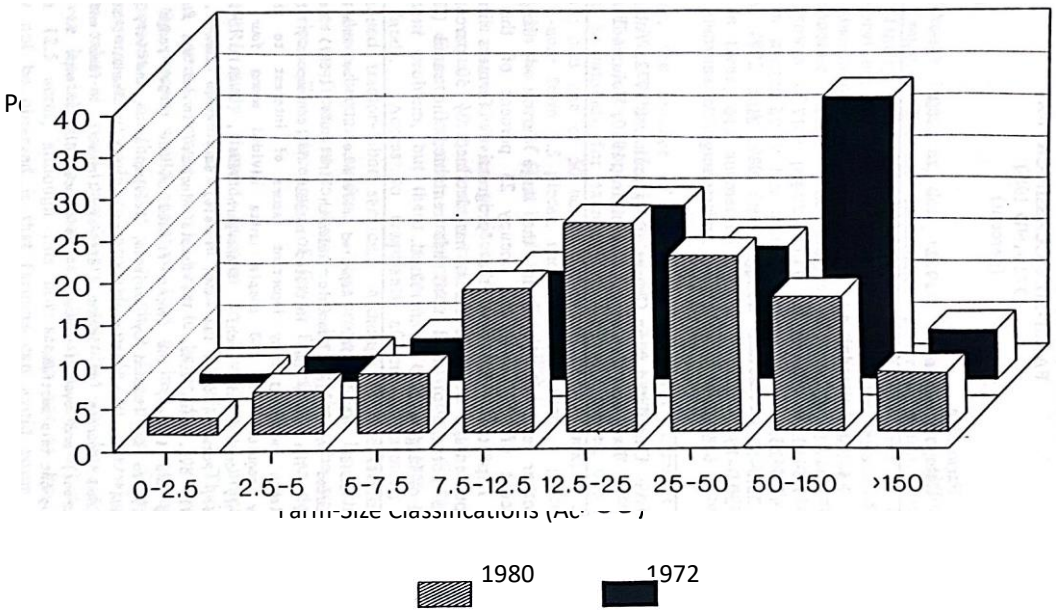


TABLE I-3

PROPORTION OF THE BARANI AREA IN EACH FARM-SIZE CLASSIFICATION 1972 AND 1980 (percent)

Farm Size Category (acres)	1972	1980
<2.5	1	2
2.5-5.0	3	5
5.0-7.5	5	7
7.5-12.5	13	17
12.5-25.0	21	25
25.0-50.0	16	21
50.0-150.0	34	16
>150.0	6	7

Source: Calculated from Census of Agriculture,1972,Volume Two, and Census of Agriculture, 1980, Volume Two.

At the other end of the scale, the large farms -- larger than 50 acres--include 4 percent of the total but occupy 23 percent of the land. This group represents an important share of the "progressive" farmers in the barani (PERI study). The percentage of large farms has declined by 50 percent since 1972 (Table I-2), while the percent of land used has remained the same (Table I-3); therefore,the average size of large farms has increased.

PERI MASTER PLAN STUDY. Repeated reference will be made to the study conducted by Punjab Economic Research Institute (PERI) for the Master Plan. The study was initiated because no contemporary information was available regarding many important issues of interest to the plan. The study consisted of 250 sample units divided among four areas of the barani, one tehsil each: Shakargarh Tehsil, Siwalik Zone; Gujar Khan Tehsil, Potwar Zone; Isa Khel Tehsil, Salt Range Zone; and D.G. Khan Tehsil, D.G. Khan Zone. The sample "included landed and landless persons. Among the landed," the sample focused on the target range of farm sizes likely to be reached by projects, leaving aside the very large and the minute. The landless families sampled were artisans. Subjects studied included sources of income, off-farm income, on-farm enterprises, farm resources, and overall changes. Reference will be made to the PERI study throughout this section.

About 26 percent of the barani farms are of medium size and occupy from 12.5to 50.0 acres of land.These farmers own 45 percent of the total croppedarea.

Although many of these farms are viable because they have sufficient land, some may not be fully able to realize their production potential. Agricultural production programs could be used to assist these farmers to increase their production to a to viable level.

Fragmentation

Farm size, although important, does not tell all about the ability of a farm to produce a living wage. Because inheritance patterns, which divide patrimonies unequally among offspring -- two units to a son and one unit to a daughter, plus one-eighth for a surviving wife or husband -- are deeply imbedded in the society,the process of fragmentation proceeds even as the inherited parcels come in smaller and often less economic sizes. The process of gradual fragmentation works in tandem with the growth of the population. All of this reduces the average farm size, making a farm progressively less able to support a farm family. As shown in Table I-4, between 1972 and 1980 fragmentation decreased in four barani districts,remained constant in three, and augmented in one -- Khushab. Although there has not been a dramatic increase in fragmentation, it remains an important issue.

In the Potwar, the number of fragments per farm increases with size, but unevenly among districts (Table I-5, Exhibit I-5). The pattern is most intense among the smaller farms, where more people must share less and less in each generation. A farm of 5 acres in Rawalpindi, for example, may have 5 pieces; one of 10 acres, 10;one of 25 acres, 15; and one of 50 acres, 23 pieces! In Attock, a 5-acre farm may have 3 pieces; a 12-acre farm 3.5 pieces, and a 25-acre farm 5 pieces. The average area per piece rises with the scale of farmn in all the districts shown.

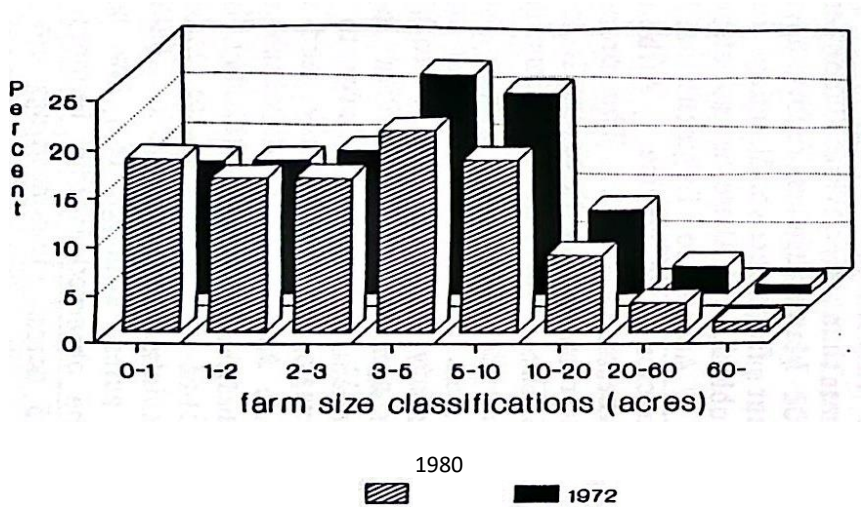
Fragmentation is more than an obvious inconvenience; it is an important source of increase in farm costs. Many farmers report having to walk 40 or more minutes to reach the most distant fragment, and many report that distance is the most important management problem, but there is no clear evidence that farmers rent out the more distant lands. Access to fragments affects a farmer's ability to rent tractors or a combined tractor-labor service. Although fragmentation has intensified,some hopeful signs have become evident. The proportion of land that has been cut up into a few pieces -- from one to three -- is larger than the proportions in any of the other categories. The percentage of farms fragmented has declined somewhat (Table I-4).

The recent PERI study showed farmers to have many practical reservations about consolidation, while agreeing with the idea in principle. Their principal fears were that good land, evena if remote, would have to be traded for poorer land that is near by and that the process would somehow lead to loss of control to well-placed,locally influential persons. At the point at which a five-piece farm is about to be subdivided, the pressures to consolidate probably begin to overwhelm the farmer's resistance. Because sales of small parcels are controlled by law, the process seems almost entirely driven by inheritance practices. Pakistani law forbids the division of farms smaller than 12.5 acres, although this law seems not to be strictly observed.One reason it may not be observed is that farmers can avoid some land revenue tax on land of less than 12.5 acres. Landholdings are thus divided among children. A farmer who owns a unit smaller than this can only sell the whole lot, not a splinter.Owners of larger'units may sell plots of any size so long as the farm remains intact.

EXHIBIT 1-4

Frequency Distribution

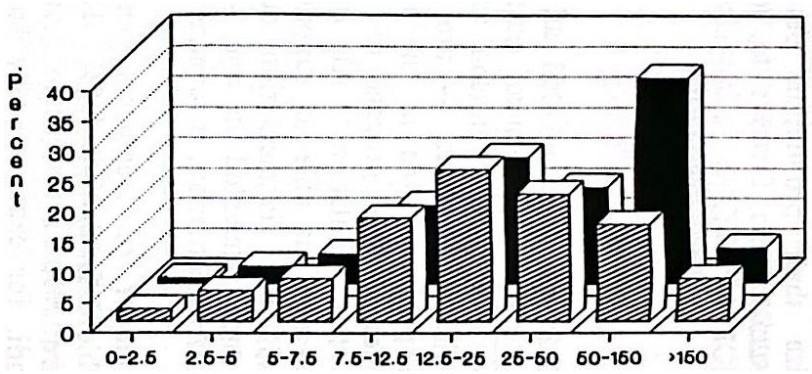
of Farms **By** Land **Size Classification**



March 1988

Distribution of Barani Area

By Farm Size Classification



March 1988

TABLE I-4

CHANGE IN PERCENTAGE OF FARMS FRAGMENTED, IN BARANI DISTRICTS 1972-1980 (percent)

District	1972	1980
Rawalpindia	91	91
Attock	82	75
Chakwal	90	84
Jhelum	94	93
Gujrat	91	91
Khushab	71	75
Mianwali	77	77
D.G.Khan	72	63

Source: Census of Agriculture,1972,Volume Three,and 1980,Volume Four.

Excluding Murree and Kahuta tehsils.

TABLE I-5

NUMBERS OF FRAGMENTS PER FARM,IN SELECTED BARANI DISTRICTS

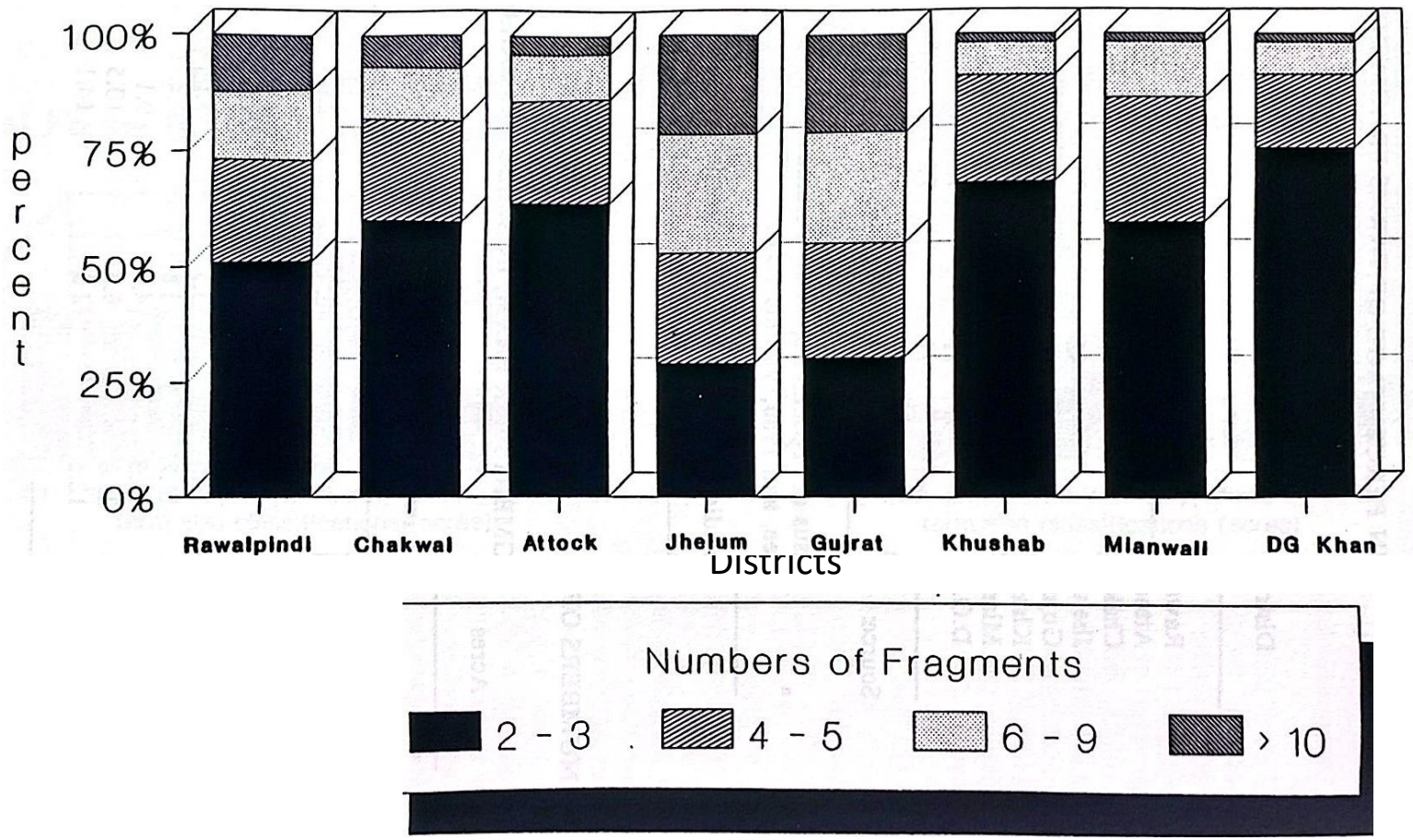
Acres	Rawalpindi	Attock	Jhelum
0.0-1.0	2.6	2.7	2.9
1.0-2.5	3.6	2.9	4.0
2.5-5.0	5.2	3.3	4.5
5.0-7.5	7.3	3.4	4.9
7.5-12.5	9.6	3.5	6.1
12.5-25.0	11.7	3.8	7.4
25.0-50.0	14.6	4.9	9.1
50.0-150.0	23.8	6.3	10.5
>150.0	12.5	12.3	14.1

Source: Census of Agriculture, Volume Two, 1980.

EXHIBIT I-5

Percentage of Farms with Fragments,

in Selected Districts, 1980



March 1988

TABLE I-6

**PERCENTAGE OF FARMS WITH FRAGMENTS,
IN SELECTED BARANI DISTRICTS,1980
(percent)**

District	Number of Fragments			
	2-3	4-5	6-9	>10
Rawalpindia	51	22	15	12
Chakwal	60	22	11	7
Attock	64	22	10	4
Jhelum	29	24	26	21
Gujrat	30	25	24	21
Khushabb	68	23	7	2
Mianwali	59	27	12	2
D.G.Khan	75	16	7	2

Source:Census of Agriculture, 1980, Volume Three.

a Excluding Murree and Kahuta tehsils.
b Including only that part of Khushab in the Thal.

Policy interventions in barani areas to augment agricultural production must.find means of overcoming the problems related to fragmentation.

Intensity of Cultivation

As farms have become smaller, most farmers have begun to cultivate more intensely, although this is difficult to measure because of changes in local boundaries (Table I-7, Exhibit I-6). Thus, the cropping intensity of a barani farm has increased.Cropping intensity is a measure of the number of times a year a particular acre is put under a crop. As crop durations fall, mechanization and water supplies become more readily available, and farmers are able to put out more crops in the course of a calendar year. Cropping intensity, however, indicating increased investment in production-enhancing inputs, has risen in selected districts, but not in others. Only in the case of Khushab has cropping intensity declined since 1972. The level of increase ranges considerably, a phenomenon difficult to explain with the information at hand. One district, Attock, lost both ways: Its farmers cropped less and farm sizes fell. Little or no extra land is being brought under cultivation, possibly because of the lack of additional land, even of low quality, to put under the plow.

EXHIBIT 1-6

Changes in Cropping Intensity, by District, 1972-1980

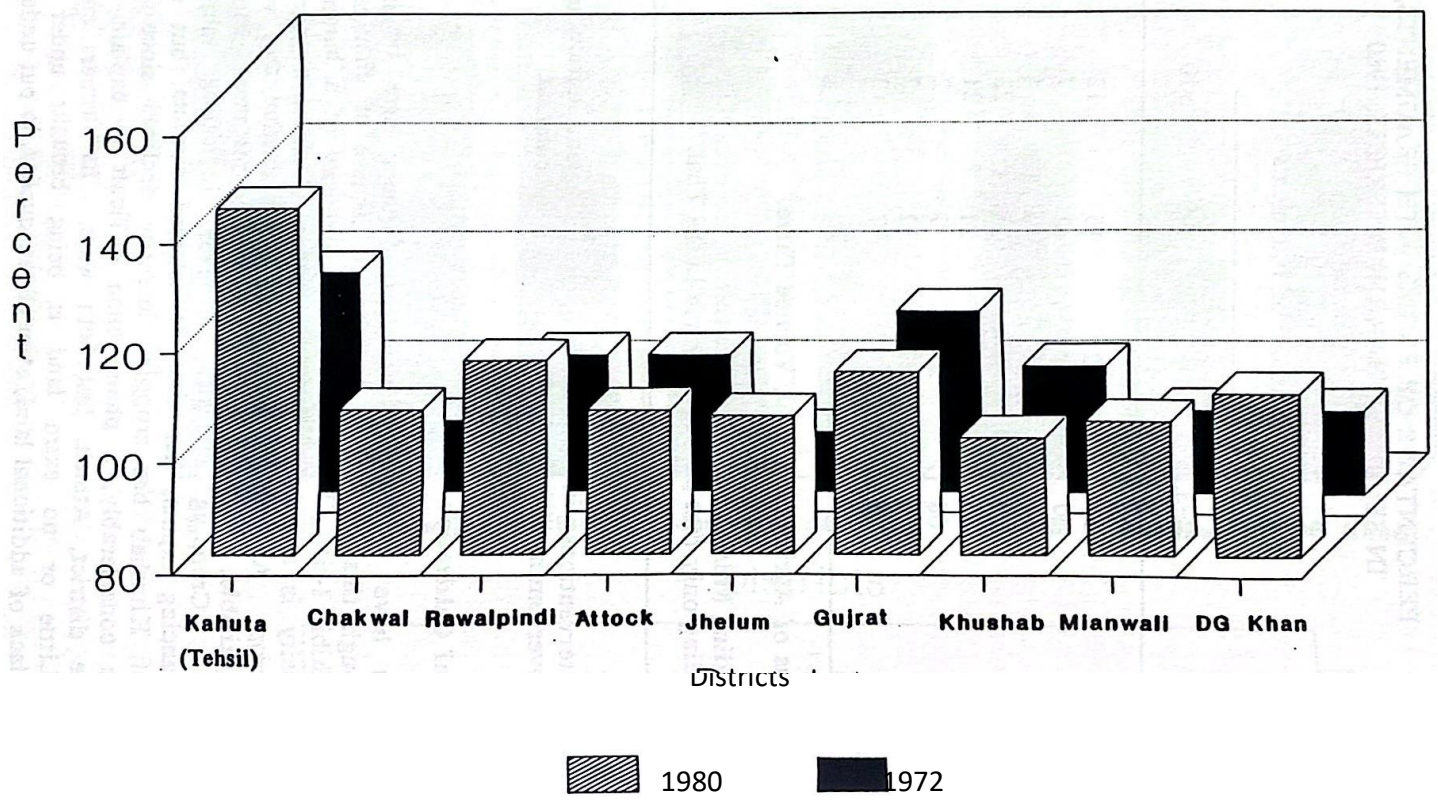


TABLE I-7

CHANGES IN CROPPING INTENSITY,BY BARANI DISTRICT,
1972-1980
(percent)

District	Cropping Intensity 1972	1980
Rawalpindi	105	115
Chakwal	93	106
Attock	105	106
Jhelum	91	105
Gujrat	111	113
Khushab	103	101
Mianwali	95	104
D.G.Khan	95	109

Sources: Census of Agriculture, 1972, Volume Five, Special Report, and Census of Agriculture, 1980, Volume Three, Special Report.

Owner-Operation and the Decline in Tenancy

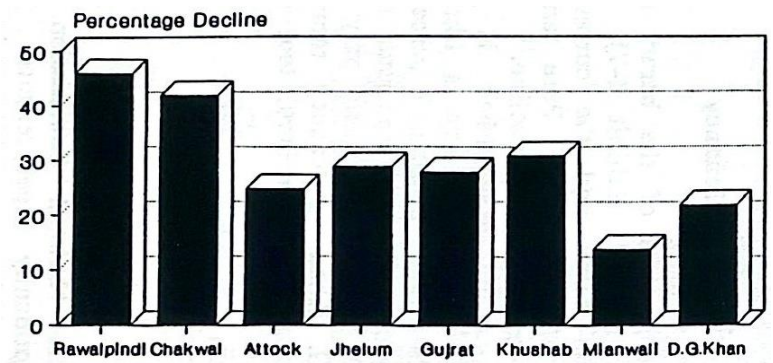
If present trends continue, parts of the barani may soon consist almost wholly of owner-operated farms (Table I-8, Exhibit I-7). In almost every district, the growth in the owner-operated farms and the corresponding decline in tenant and owner-cum-tenant operations has continued. Pure tenants are everywhere a minority and the number appears to be in a steep decline.13 In Rawalpindi, tenancy fell 46percent; in Chakwal, 42 percent; and in Khushab, 31 percent in only eight years. In two districts, Rawalpindi and Jhelum, tenancy is likely to become rare in the near future. If the annual growth rate of decline, 3 percent, that prevailed in Rawalpindi from 1972 to 1980 has continued until the time of writing, 1988,for example,tenancy in that district will have declined to only 2 percent. In the south -- Khushab,Mianwali,and D.G. Khan -- tenancy remains widespread, about half the farms being operated by tenants, although here, too, a decline has begun (Exhibit I-7).

13 The report of the National Commnission on Agriculture notes that in Pakistan landlords only exceptionally expel tenants. The rate at which tenancy has declined in parts of the barani would suggest otherwise in this instance.

EXHIBIT I-7

Decline in Tenant-Operated

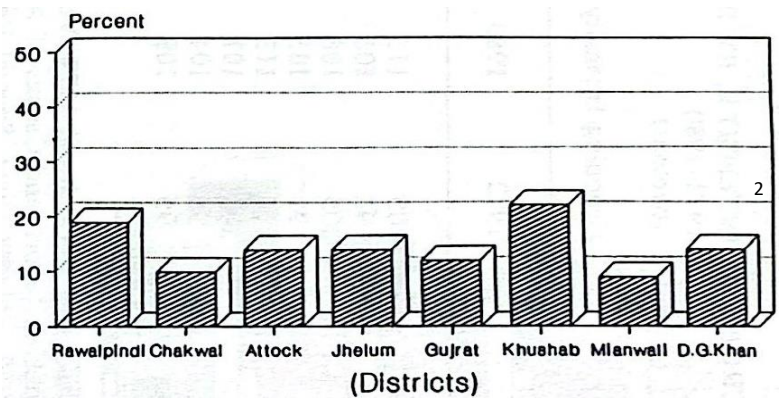
Farms,1972-1980



(Districts)

Increase **of Owner-Operated**

Farms,1972-1980



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March 1988

TABLE I-8

PERCENTAGE OF BARANI FARMS OPERATED BY OWNERS
AND THE ASSOCIATED DECLINE IN TENANCY,
IN SELECTED DISTRICTS,1972-80

District	1972	1980	% Decline in Tenancy
Rawalpindi a	58	77	46
Chakwal	53	63	42
Attock	45	59	25
Jhelum	53	67	29
Gujrat	58	70	28
Khushab b	31	53	31
Mianwali	36	45	14
D.G.Khan	37	51	22

Source:Census of Agriculture, 1972, Volume Five, and Census of Agriculture,1980,Volume Three.

a Excluding Murree and Kahuta tehsils.b Including that part of Khushab that is in the Thal.

Access to Land

Access to land is becoming more difficult. Land values appear to be rising,driven in part by rising prices of farm products generally. Little arable land is left untilled. Agriculture has begun to shift away from being a way of life and toward being a commercial proposition, a transformation that has many consequences: Owners are taking a more direct interest in their land, tenants are gradually being removed,"commons" lands, on which certain subsistence animal enterprises depend, are in a state of transition, and holders of small plots, often low income, may be placed under pressure -- and may be tempted -- to sell out. New land development is expensive, and more and more it involves the establishment of tubewells and the necessary supporting structures, as well as including leveling of the land. It is becoming more and more difficult for small farmers to locate good alternatives within agriculture, because of slowly changing farm technologies.

In the setting of a fragmented land pattern, hiring the use of additional land to supplement an owned core would seem to be a farmer's logical response. Yet where fragmentation is most intense -- in Rawalpindi, Jhelum, and Gujrat (Table I-6) -- is exactly where owner-cum-tenancy is least common. Conversely, where fragmentation is least serious, the renting of land is most often practiced (Table I-8).14The explanation seems to lie in the reluctance of owners to rent out land.

14 Census of Agriculture, 1980, Volume Three.

Farmers are loath to rent out land for two reasons: first, fear of loss of ownership, through political action by which land is given to occupants; second,financial. There is a short-term, interest-free loan of Rs 12,000 to cultivators of land that owners would like to have for themselves. A tenant can claim it, using future production as collateral, but ownerswant to realize the benefitfor -themselves.

The Changing Composition of Farm Income

In analyzing the changing composition of farm income, three aspects will be considered: crop-based income, livestock income, and income from off-farm employment.

Crop-Based Income

The barani is perceived to be farmland, its inhabitants largely dependent upon agriculture, and this has been true until recently. But a growing population dependent upon a fixed land base has led to a decline in the ability of farms to provide adequate subsistence, even as yields have increased. The costs of production of wheat, for example, are such that many farms, particularly smaller ones, lose money on it if the costs of labor are factored in at opportunity costs.15 In such instances the well-being of the farmer would be improved if he withdrew from wheat production, putting farm labor to work on other crops or shift it to off-farm work.Barani peoples are being compelled to exploit new economic opportunities and find new strategies of survival, a shift that has been reflected in the composition of farm incomes. Total household incomes appear to be rising, but theimportance of the farm as a source of income has been diminishing.

Empirical support for this transformation is narrow, but growing. There is evidence, from a number of sources dating back more than a decade, that off-farm incomes have become an important part of total farm-family incomes, and their importance may be growing.16 As long ago as 1972-76, a PERI survey found less than 25 percent of the total farm family income to accrue from non-agriculture sources.17 The present PERI study, ten years later (1987), suggests the share may _____

15Chaudhry and Bashir, Cost of Producing Major Crops in Jhelum District (University of Faisalabad, 1982). In this study, which is based on 124 sample units,the net return per acre on wheat production is found to be Rs 1,039 with labor accounting for 20 percent of the cost production and bullock-supplied energy nearly 60 percent. A shift to more rapid tillage by tractor should change this calculation materially.

16 Since the early 1970s PERI has produced a series of occasional studies on the subject of Farm Accounts, Family Budgets of Rural Families, and Cost of Production of Major Crops in the Punjab. These always include a comparison of barani farms and irrigated farms.

17 PERI,op cit.

noww be as high as 50 percent and in some instances greater. The PERI study found that among respondents in Shakargarh, 43 percent of the total farm family income derived from non-farm sources, 56 percent in Gujar Khan, 42 percent in Isa Khel and 38 percent in D.G. Khan (Exhibit 8). From the late 1970s earnings from foreign remittances have grown as well (reported to be 8 percent of the income in the sample farms in 1979).

A contemporary study; also based on surveys, generally supports these findings (Table I-9).18 It shows incomes from livestock to be roughly comparable in all three rainfall zones -- 33 percent to 29 percent, from driest to wettest -- while the proportions earned from all crops, food and cash, varied from 48 percent in the driest areas to 31 percent in the wettest. These variable proportions reflect the greatly different off-farm incomes earned by farmers -- only 19 percent in the dry south versus 39 percent in the wetter north. Over all, remittances, from incomes earned abroad, amounted to only 2 percent.

The cash incomes reported in Table I-10 show that off-farm incomes are needed to produce cash and that much of the additional income is spent on consumption.These cash incomes do not capture the subsistence in-kind income earned on-farm,but they do indicate that to the extent the farm cannot cover subsistence needs,farm cash incomes are meager supplements. A good part of these incomes is consumed in the purchase of inputs for the farm. In one instance, the reporting farms in D.G. Khan had, on the average, no cash left over from the purchase of inputs.

TABLE I-9
SOURCES OF CASH INCOMES, BY BARANI RAINFALL ZONE
(percentage)

Source of Income	Low	Mid	High	All
Livestock	33	31	29	30
Food Crops	18	21	16	18
Cash Crops	30	15	15	20
Off-Farm Jobs	19	29	39	29
Remittances	1	4	1	2

Note: Percentages may not add to 100 because of rounding.

Source: E.Mallorie,Livestock Cropping in Pakistan, draft (1988).

Low refers to D.G. Khan and the Thal, mid to the Salt Range and much of the Potwar, high to northern Potwar and Siwalik.

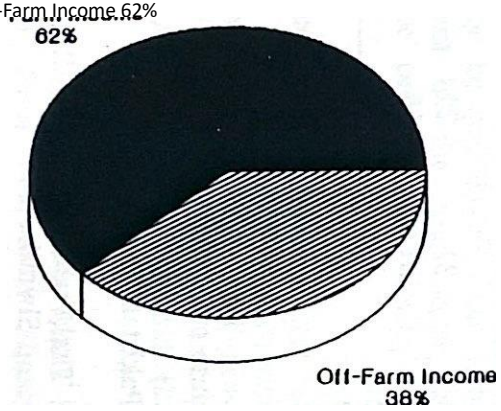
18 E. Mallorie, Livestock and Cropping in Pakistan, draft (1988). A survey based on field interviews.

EXHIBIT 1-8

Farm and Off-Farm Income Compared,Selected Areas

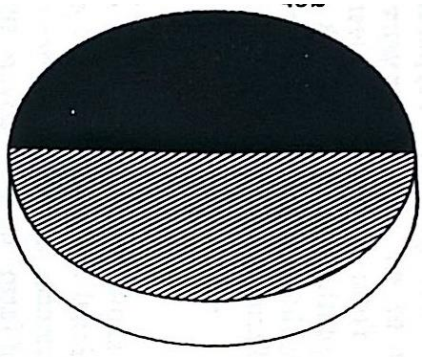
Shakargarh

On-Farm Income 62%



Gujar Khan

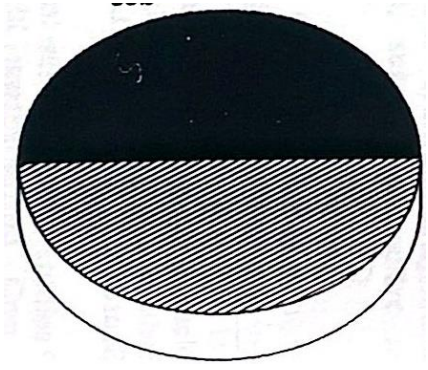
On-Farm Income 49%



Off-Farm Income 61%

Isa Khel

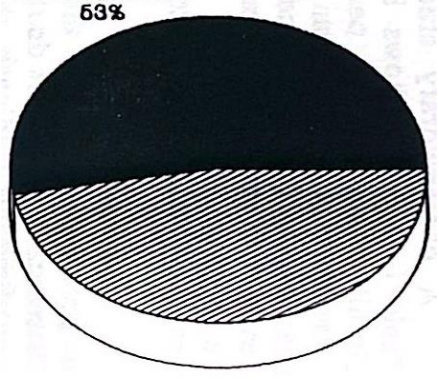
On-Farm Income 60%



Olf-Farm Income
60%

D.G.Khan

On-Farm Income



Olf-Farm Income
47%

So great is the need for cash to meet current consumption expenses that almost all -- 87 percent -- of the off-farm increment is reported by PERI to be used in its support as well. Comparatively few farms were found to be able to increase on-farm productivity through investments. If they did invest, their first priority was extra land, followed by machinery, and finally irrigation facilities. Twenty percent of the households used remittance money to increase the capital endowment of the farm and 10 percent put money into education.19

Crop-related variable costs -- for purchased inputs such as fertilizer -- take a substantial share of gross crop earnings. These are reported by PERI to be 80percent in Shakargarh (Siwalik), 80 percent in Gujar Khan (Rawalpindi), 80 percent in Isa Khel (Mianwali), and nearly 100 percent in D.G. Khan. In this context off-farm incomes became proportionately much more important -- 69 percent in Shakargarh, 83 percent in Gujar Khan, 71 percent in Isa Khel and close to 100percent in D.G. Khan. (Table 10). These cash incomes shrink considerably when they are divided by the number of members in a family to produce per capita incomes:Shakargarh,9;Gujar Khan, 8; Isa Khel, 9; and D.G. Khan, 11.

Empirical information linking actual farm size with investment is lacking: it seems reasonable, however, to presume that some correlation exists; as absolute farm size declines the potential return on investment in the farm is likely to be less than the investment in other, possibly nonfarm, activities. This situation would be exacerbated by fragmentation, distance from markets, access to complementary resources,and so on.

TABLE I-10
CASH INCOMES OF BARANI FARM HOUSEHOLDS
(Rs)

District	Gross Farm Revenue	-	Total Variable Costs	=	Net Farm Revenue	+	Off-Farm Revenue	=	Total Household Revenue
Shakargarh	27,000	-	20,000		7,000	+	*16,000*	=	23,000
Gujar Khan	15,600	-	12,000		3,600	+	15,000	=	18,600
Isa Khel	20,000	-	16,000		4,000	+	10,000	=	14,000
D.G.Khan	17,000		17,000	=	0	+	13,000	=	13,000

All numbers are rounded.

Source: PERI, Farm Accounts, Family Budgets of Rural Families, and Cost of Production of Major Crops in the Punjab (1987).

19 These figures represent multiple responses, some farms doing a bit of each.The reality is that most of the remittance money is used for current consumption needs. This makes more sense when the findings in section two,proportion of farms satisfying subsistence needs, are taken into account.

The Importance of **Livestock**

Farmers react to growing pressure on the land and changing circumstances in several ways. They may change their crop and animal programs in response to shifts in relative prices. On the farm, farm managers can adjust methods continuously to reflect changing proportions of inputs available to them. As land area declines in relation to the number of farm workers, the application of the crop technology shifts accordingly, to become more labor-intensive. The shift in the population-to-land ratio brings with it an absolute increase in the demand for on-farm labor, which fluctuates with the crop production cycle. There are peak periods of demand for labor, at which time family labor returns to the homestead from various off-farm jobs to work. There are also times when there is relatively little demand for workers, with which the residual labor force on-farm can cope. Farmers may also invest in fertilizer. Virtually all farms have some livestock, large and small ruminants. The large animals are supported in part from various fodder crops, which are integral parts of the farm program. Wheat straw is an important feed, and its value contributes measurably to the worth of the crop. The herd can be manipulated in several ways. The availability of contract traction, for example, may encourage a farmer to let go of his draft team and replace them with milch cows or buffalo.20Easily sold and managed, small ruminants may provide a promising additional income.

The crop-livestock mix is believed to vary by zone and by income group. Food crops amount to approximately a fifth of a farm family's cash income -- and more if home-consumed wheat is factored in -- and most households sell some wheat, even when they must later buy some back. Most have some cash crops as well, although the sort of crop depends upon the scale of operation. Some crops, the minor ones,appear to be largely grown and sold by small farms. These include maize, pulse --lentils,chickpeas, cowpeas, and the like -- and edible oil seeds.

Animal holdings are important and, except for buffalo, vary inversely with rainfall (Table I-11). Almost all farm families, and many nonfarm rural families, keep livestock. The landless are reported in the Agricultural Censuses (1960 to 1980) to be shifting their herds toward larger, stall-fed animals, buffalo, and milk production and away from cattle. They are also moving from sheep to goats. Persons who have access to land, on the other hand, are shifting the composition of their herds from sheep to goats, which they sell as meat animals. They are adding to their herds of larger animals, holding cattle constant and adding buffalo, both of which are used for milk production. Numbers of animals held can vary greatly. Herds of hundreds of small ruminants are reported as are a few sizable milk herds, but average holdings are small, numbering no more than a half-dozen goats and sheep and two or three larger animals, including in many instances a bullock or cow and a buffalo (Table I-12). More information on the composition of and changes in livestock holdings will be found in Volume Four.

20The farmer's tendency to get rid of draft animals, however, may be tempered in practice by a fear of renewed increases in oil prices which could make custom traction too expensive. Farmers who made a full commitment to tractors in the early 1970s, for example, had to take up animal traction again in many particular instances.

TABLE I-11
SIZE OF ANIMAL HOLDINGS, BY BARANI RAINFALL ZONE

Type of Animal	Rainfall Zone			
	Low	Mid	High	All
Buffalo	1	1	1	1
Cows	3	2		2
Young Stock	3	1	2	2
Draft Animals	2	2		
Sheep and Goats	5	3	1	3

Source: E.Mallorie, Livestock and Cropping in Pakistan, draft (1988).

TABLE I-12

DAIRY ANIMAL HOLDINGS IN THE BARANI, BY TYPE OF FARM OPERATION,1987
(number of animals)

District	Owner-Operated	Tenant-Operated	Nonfarm Rural
Shakargarh	1	1	2
Gujar Khan	2		1
Isa Khel		1	2
D.G. Khan	3		

Note: All numbers are rounded.

Source: PERI, Farm Accounts, Family Budget of Rural Families, and Cost of Production of Major Crops in the Punjab (1987).

The herds provide three sorts of output: dairy products -- essentially milk and ghee -- and small ruminants and young cattle and buffalo for meat.21Their relative importance in livestock derived income appears below (Table I-13).

TABLE I-13

CONTRIBUTIONS OF DIFFERENT LIVESTOCK PRODUCTS,
BY BARANI RAINFALL ZONE
(percent)

Product	Rainfall Zone			
	Low	Mid	High	Al
Milk	4	8	22	12
Ghee	2	2	0	2
Young Stock	94	90	78	87

Note: Columns may not add to 100 because of rounding.

Source: E.Mallorie, Livestock and Cropping in Pakistan, draft (1988).

Off-Farm Employment

When the farm is unviable, a source of supplementary income becomes a matter of necessity. Off-farm employment is the most remunerative option open to most farmers. The cyclical nature of crops, with peaks and troughs in the demand for labor, encourages farmers to look for short-term, off-farm jobs. Barani farmers are commonly qualified for little else but unskilled labor. Off-farm jobs, especially in rural areas, are for the most part manual and unskilled; even so, they pay a higher hourly wage than most farm work. Better-paying jobs require technical skills and demand a longer commitment, which may require the job seeker to take up **permanent** residence elsewhere.

It is important to bear in mind that the averages mask considerable diversity in farming types in the barani. Barani farmers follow diversified survival programs,each configured in response to particular local circumstances. Indeed, their ability to adjust to shifting economic winds may be an important reason that a strong

21 The importance of dairy products in comparison to meat conforms to income elasticities for agricultural products used in the National Commission Report,op. cit., reported in Thomas C. Pinckney, Naved Hamid, Suzanne Gnaegy, and Alberto Valdes, The Wheat Economy of Pakistan: Setting and Prospects, Paper prepared for the U.S. Agency for International Development (1987). The coefficients for meat range from 1.4 to 1.7 and for milk from 0.66 to 0.80.

agricultural base persists. Adjustments to income-earning opportunities are reflected in a shifting composition of income. The 1987 PERI survey of four tehsils revealed quite different combinations of income streams in total household incomes (Table I-14, Exhibit I-9). It is not surprising that respondent farms close to large cities,earn nearly half their total incomes off the farm. In more remote Isa Khel,off-farm incomes amounted to only 36 percent of total household incomes. No time series appears to exist in this regard, but it is perhaps suggestive that a series of farm-management studies made by PERI in Campellpore, Attock, in 1972-75 showed off-farm incomes to amount to only 20 percent of total household income. The latter study and a series of follow-up studies demonstrated how on-farm incomes shift with the overall economic climate (Exhibit I-9). Farm incomes rose during the latter 1970s, when the terms of trade for agricultures were relatively favorable, and they began to decline in absolute terms when fertilizer subsidies began to be withdrawn,while wheat prices grew only slowly.

TABLE I-14

CHANGING COMPOSITION OF INCOME ON FARMS IN ATTOCK, 1972-1975 and 1987

Period and District	Average Size of Farm (Acres)	On-Farm Income (Percent)	Off-Farm Income (Percent)
1972-75	NA	80	20
1987			
Shakargarh	10	62	38
Gujar Khan	8	49	51
Isa Khel	16	64	36
D.G.Khan	8	53	47

NA =Not available.

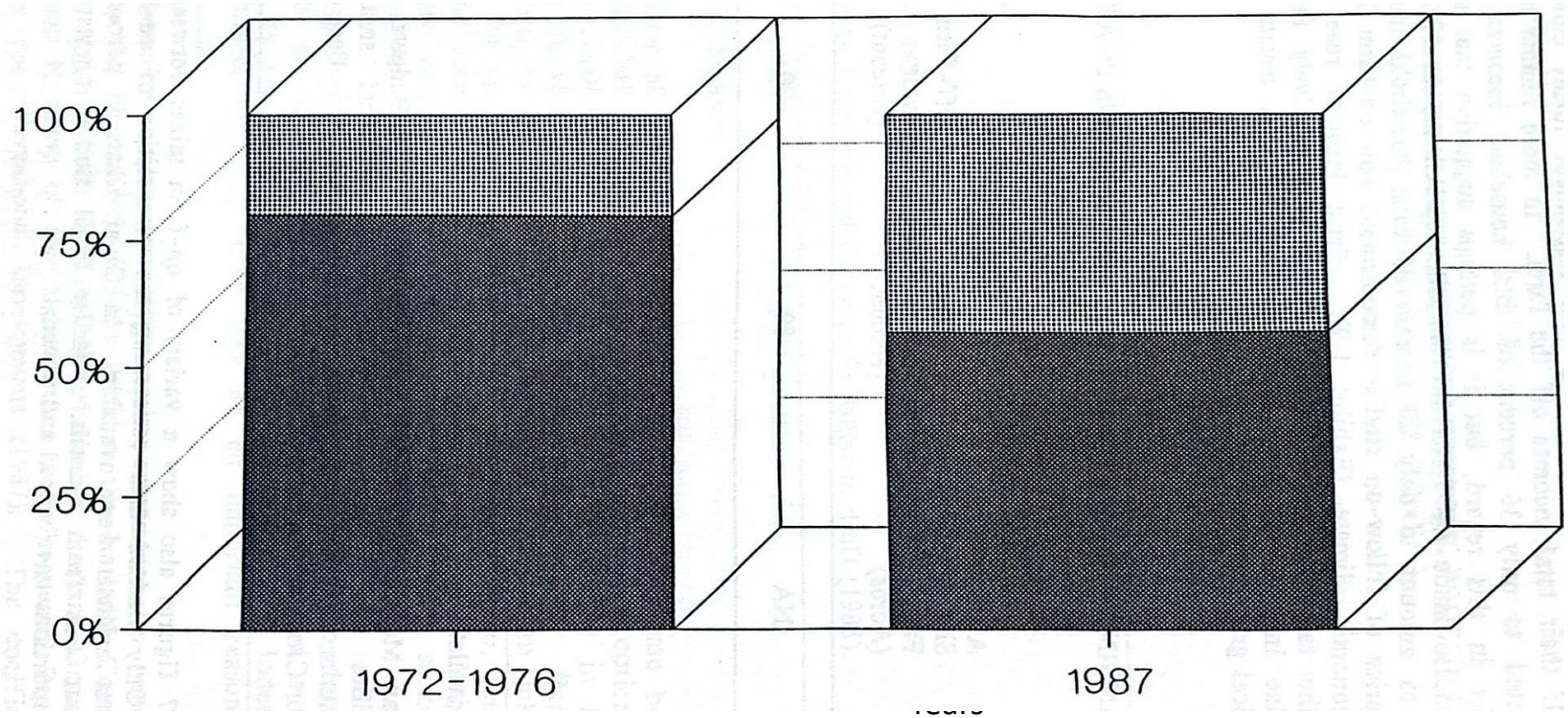
Source:Sardar Mohammed, Farm Accounts and Family Budgets of Selected Rural Families of Punjab, 1972-1975,PERI occasional studies; PERI, Farm Accounts, Family Budgets of Rural Families, and Cost of Production of Major Crops in1 the Punjab (1987).

The 1987 figures also show a variety of on-farm mixes between crop and animal enterprises. Only limited data concerning the composition of on-farm income from crops and from animals were available. In Gujar Khan 33 percent was from crops and 22 percent was from animals. Earlier PERI studies suggest that through the years these proportions have waxed and waned.

EXHIBIT I-9

On-Farm and Off-Farm Income

in Attock, 1972-1987



Although the figures show a progressive growth in the importance of off-farm income to the farm household, they do not of themselves indicate a decline in the importance of the farm -- or rather, the farm and its crop program. The farm has become one of several sources of income open to farmers, and the relative importance of these are likely to vary in time and place.

It is almost certain that as more and more barani farms cease to be able to support farm households or provide a day wage equivalent to the off-farm possibilities, growing numbers of rural men will look off the farm to fill the income gap. Off-farm employment appeals because it pays better than on-farm work,but there are other trade-offs to consider, as well. City work may offer a quality of life unavailable in the countryside, but it may also mean expensive travel, lodging,and food as well as prolonged periods away from home. Farmers must factor these conditions into their work decisions. For farm work to provide an income comparable to off-farm income, farm technologies that can provide a satisfactory return on labor and increase the overall return on ownership will have to be introduced. Public policies, high prices of agricultural commodities, and low prices of inputs, together with no taxation, cannot in themselves provide sufficient incentives to farmers to remain fully committed to agriculture in the absence of technological change.

Changes in the Level of Debt in the Potwar

The eight years from 1972 to 1980 saw an important change in the pattern and level of rural debt in the Potwar, both in absolute terms and in comparison to the Punjab as a whole, and there is no reason to suspect that the trend has halted since 1980.22 In 1972 more than 41 percent of all farm households except owner households in Rawalpindi had some form of mid- or long-term debt (Table I-15). By 1980 the percentage in all districts was less than 20. The overall burden does not now appear to be serious. The best explanation for the downward trend is that remittances have been used to retire debt. The overall pattern, however, has varied and perhaps reveals differing investment opportunities.

A decade ago, a larger percentage of farms in the Potwar were in debt than in Punjab as a whole, in all three operation classifications, where the percentage was 35.23 With heavy repayments, the average number of Potwar agricultural households in debt has declined 73 percent. The proportion of farm households now in debt in the Potwar and all of its constituent districts -- 10 percent -- is smaller than in Punjab as a whole, where it is 17 percent.24 Also, the average size of debt in Punjab, Rs 7,000, was somewhat higher than in the Potwar, where it was Rs 6,000.

22 Figures on rural debt have been presented only for the last two censuses.

23 Information in this paragraph is based on data from the Census of Pakistan,1980.

24 Debt is defined here to include only long-term, fixed obligations. Annual rental charges for hired land, tractor service, and other variable costs related to production are therefore excluded.

Typically, no more than 10 percent of the farmers of all three classifications are in long-term debt; within classifications the distribution ranges from 9 to 15 percent.Levels of debt among them varies considerably. On the basis of 1980 figures, the average owner-farmer in the Punjab owes Rs 8,040; the owner-cum-tenant, Rs 5,300,and the pure tenant, Rs 3,400.25 The figures for the Punjab, higher than barani figures, are probably correlated with the presence of irrigation in part of the province, because irrigation provides a somewhat higher return on investments than can be realized in the drier, less irrigated Potwar.

Both the distribution and composition of debt have changed significantly (Table I-15, Exhibit I-10). Owners are less likely to be in debt than owners-cum-tenants and pure tenants, although the average debt of owners was larger in 1980 (Table I-16). During the period 1972-1980, the number of loans made for the purchase of tubewells, tractors, and other farm implements increased, and these are reflected in the amount of mid- and long-term debt. It is possible that owners have been able to finance purchases from current income -- from whatever source -- while tenants must borrow to capitalize their farms. Among all classifications, debt and scale of operation are directly correlated: The larger operators are more likely to carry some long-term debt (Table I-16).

Owners tend to carry the largest debt, but more owners-cum-tenants and tenants are likely to be in debt than owners; there seems to be little correlation between size of farm and level of debt by type of land tenure. These also seems to be low correlation between level of debt, location, and land tenure. Most debt-prone is the owner-cum-tenant in Attock -- 18 percent on the average; the least debt-prone is the Jhelum owner -- 6 percent on the average (Table I-15).

From anecdotal information in the PERI study it is suggested that Potwar people -- and by inference those in the barani in general -- have used their off-farm incomes and remittance money to build houses, buy Suzuki jeeps, then purchase consumer goods, often electrical. The Potwar resident also seems to give a high priority to the use of this income to retire debt. Farmers who used to rent now seem better able to buy and operate their own farms. Statistics on farm ownership lend some support to this statement; measured as percentages of cultivated land, in 1972, 51 percent of the land was owner-operated, and 39 percent owner-cum-tenant;in 1980 these figures were 63 percent and 29 percent, respectively (Exhibit I-11).

Similar changes have taken place among holders of livestock. Whereas in 1972,31 percent were in debt, in 1980 only 6 percent were.26 Part of the reason holders of livestock were able to reduce their debt was probably the rising price of meat and the change in composition of herds in favor of the highly marketable teddy goats.

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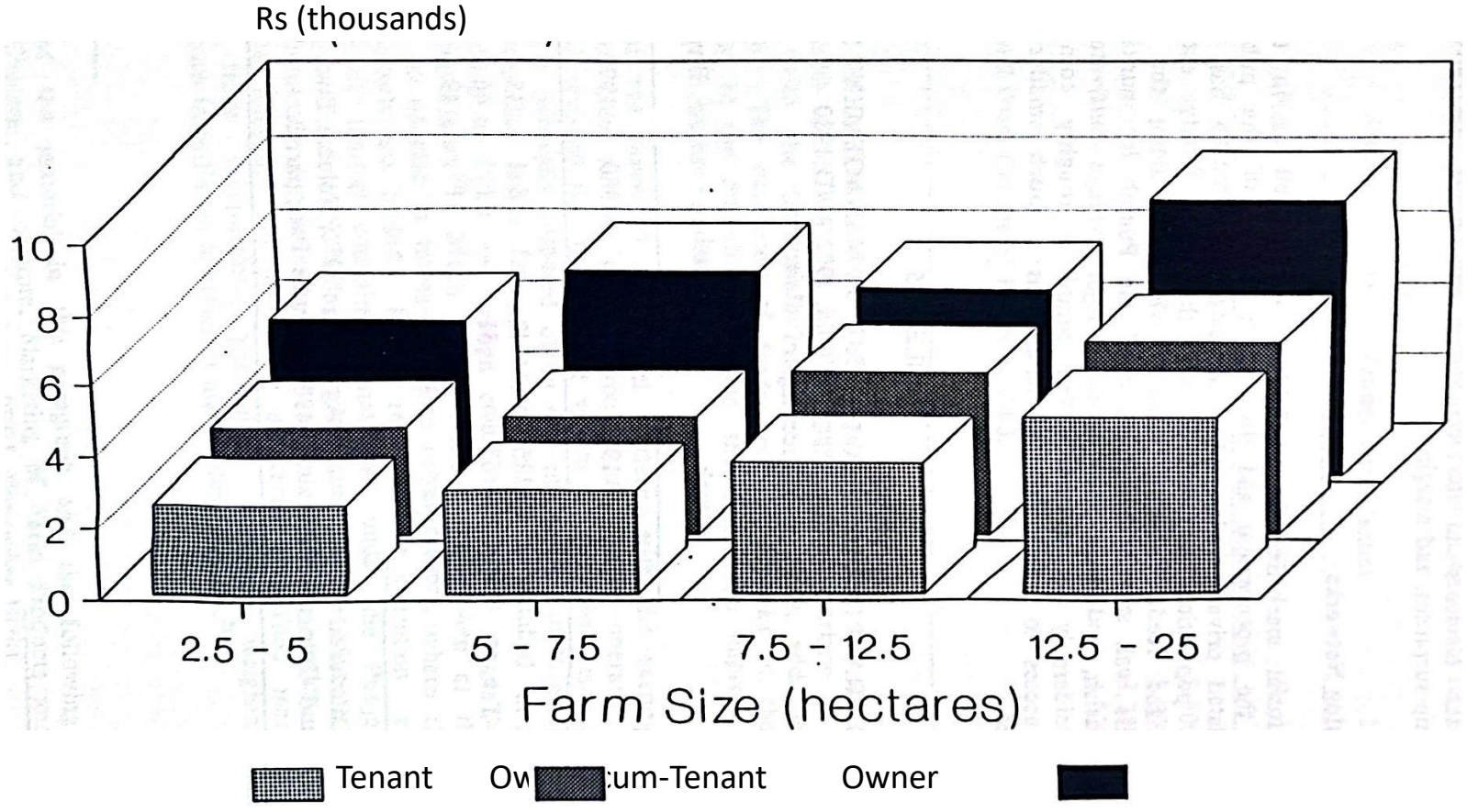
25 Information on the outstanding debt, by tenure, was not collected in the 1972 census, so a statement regarding comparative trends cannot be made.

26 Calculated from the Census of Agriculture 1972, Volume Two, and the Census of Agriculture 1980, Volume Two.

Debt per Barani Farm, **by Operation** Classification, 1980



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Agricultural Marketing in the Barani

Important elements to be considered in barani agricultural marketingare networks, crop surpluses, and margins.

Marketing Networks

Agricultural marketing in all Pakistan -- as well as in the barani -- is a mixture of the procurement and distribution systems of the public sector, regulated and unregulated private trade, and agroindustries.27 Punjab has the highest ratio of markets to population in Pakistan and the most firmly established system of agricultural and feeder markets, most of which are along the trunk roads. The barani is less well served than the rest of the Punjab by marketing services; fewer markets flourish, and each must cover a larger average cultivated area, the pattern varying considerably by district. The barani is roughly comparable to irrigated Punjab in access to roads, but the barani has a much smaller proportion of all-weather roads.

TABLE I-15

BARANI HOUSEHOLDS IN DEBT, BY MANAGEMENT SYSTEM
IN SELECTED CITIES,1972 AND 1980
(percentage of all farmers)

	Attock		Jhelum		Rawalpindi	
Management System	1972	1980	1972	1980	1972	1980
Owner	43	15	42	6	35	9
Owner-cum-Tenant	47	18	51	11	46	15
Tenant	49	14	· 45	11	49	13

Source: Calculated from Census of Agriculture 1972, Volume Two,part 2, and Census of Agriculture 1980,Volume Two,part 2.

27Much of the information appearing in this section was taken from the Report of the National Commission on Agriculture,1987.

TABLE I-16
DEBT PER BARANI FARM,BY OPERATION CLASSIFICATION, 1980

	Owner		Owner-cum-Tenant		Tenant	
Scale (hectares)	Rs	%	Rs	%	Rs	%
2.5-5.0	4,400	7	3,000	15	2,500	12
5.0-7.5	5,800	9	3,300	13	2,900	13
7.5-12.5	5,300	9	4,600	16	3,700	14
12.5-25.0	7,800	14	5,500	17	5,000	10

Source: Calculated from Census of Pakistan,1980.

The scarcity of market outlets in the barani increases the cost of marketing and in turn reflects weak linkages between farmer and markets. A paucity.of markets, together with the low quality of dirt feeder roads, adds to the cost of marketing services. The expansion of feeder market networks in the Barani area,which is happening in the Punjab as a whole, should in time improve the access of the rural population to market facilties.

Nearly all of the marketed agricultural produce, with the exception of wheat,which can also be sold to one of the procurement centers operated by the food department, is sold through the open market system. Most wheat is sold immediately after harvest and is generally disposed of in one transaction, most of the marketable surplus coming from the larger farms. Most produce is handled through traders--64 percent, according to PERI -- through commission agents -- 5 percent -- and through village shopkeepers.28 Much of the trade is undertaken at the farm level,but open markets do operate in towns and large urban centers, where the majority of perishables and animals are traded. Punjab regulates the operation of the markets through a system of market committees established under the Punjab Agricultural Produce Marketing Act of 1939 and the Agricultural Produce Markets Ordinance of 1978, but price collusion, discrimination by vendors, excessive margins, and high unit operating costs are alleged. In one study of barani-area food marketing it was determined that trade malpractices, particularly improper weighing and price collusion, are a serious impediment to efficient market development.29

28Much of the material in this paragraph and the following section were taken from Ali, Cheema, and Ateeque, Marketing of Farm Products and Farm Inputs in "Barani" Punjab and NWFP, No. 176 (Lahore: PERI, November 1979).

29 Ibid.

The government has actively intervened in produce marketing in the past. The present level government of intervention is much reduced from the level 20 years ago, but it is still important in respect to particular commodities. Government intervention in the past pushed private trade almost completely out of vegetable oils -- and sorely constrained production as wvell. Prices of vegetable oils were kept artificially low to enhance incentives to domestic producers, but five years of administered low and constant prices have stifled both private trade and private production. The livestock trade is entirely in private hands, as are the trade in coarse grains, spices and condiments, fruits and vegetables, gur, pulses, milk, and eggs. Prices of these goods are for the most part left to the market. Meat prices are not set by the market; maximum retail prices are decreed for butchers and are enforced from time to time. More onerous is the long-standing ban on meat sales on Tuesday and Wednesday. There is no private competition in the marketing of sunflower seeds. Assured market facilities do not exist in many local areas. The Ghee Corporation has a monopoly on procurement.

The government sets a floor price for wheat. Farmers must bring their produce to one of 250 procurement centers or to one of 630 temporary centers that are open from May through September, the months following the wheat harvest. In Punjab,the two procurement offices, the Punjab Food Department and the Pakistan Agricultural Storage and Services Corporation, operate a total of 656 receiving centers, making this the largest system in the country. The price that they set provides a floor protection to farmers, although it is set close to the market price.The price is set at planting time. The 1987 price was set at Rs 82.5 per 40kilograms. The government buys and sells wheat at the same price, in effect providing free storage to buyers. The provision of free storage by the public sector may be one reason that small farmers sell wheat at harvest, then repurchase it later as they need it. Buying centers for wheat are comparatively few in the barani.

In various studies evidence has been found that the performance of village markets in areas similar to some in the barani were such that prices in villages were closely correlated with those in primary markets.30 Transfer costs have been found to be reasonable among intermediate markets. Margins obtained by intermediaries above village prices were not large. Thus, urban market prices arenot much higher than wholesale prices in the village. Although agricultural markets are reasonably competitive, improvement can be made. Existing market facilities are cramped,congested, and unhygienic. Timely price information is neither collected nor made public. No system of grading exists to differentiate among products of different quality. Significant changes must be made in the market system if farmers are to receive a larger share of the final market prices of commodities marketed through procurement and temporary centers.

Marketing of Crop **Surpluses**

The marketable surplus that accrues in some parts of the barani can be substantial. In the Potwar, for example, farmners recently produced 500,000 metric tons of wheat, of which nearly 60 percent was sold on the market. In other parts of the barani, farther south and with less rainfall, only meager surpluses may be produced. Most farms, regardless of scale, sell some wheat, in many instances to _____

30 Ibid.

service debt. PERI has shown that sales are largely scale neutral.31 A third of the farmers regularly sell a surplus of wheat.32 The other two-thirds may have to buy wheat at some point to augment supplies. Some farms, especially those in debt, are reported to sell virtually their entire output at harvest to pay debts assumed in connection with production of the crop. There is no immediate evidence of farms being burdened with long-term debts. Tenant farms, of course, are in a somewhat different position in that they must sell substantial quantities to meet rental commitments.

Ninety percent of the wheat is sold within a month of the harvest. The wheat stored on-farm appears to sustain a loss of less than 4 percent. Two crops,groundnuts and gram, are sold by many farmers in the Chakwal-Attock area. The quantities sold are changing; groundnut production has doubled since 1970, while production of gram has declined by half during the same period. A small number of farms market peas, sesame, and masoor (lentils).s3

Marketing of wheat may be adversely affected by the decline in the importance of tenancy. The PERI study conducted in Attock shows that owners and tenants on farms of the same size sell different proportions of their crops; tenants sold 32percent more on the average, reflecting their need to meet land rents.34 Free market prices would be affected gradually by the shift to owner-operation to the extent that the amount of wheat sold from the barani areas was economically significant.

Market Margins

Agricultural markets in Pakistan -- and probably in the barani as well -- are characterized by high distributive margins, especially for perishable commodities. In 1983-1984 the farmgate price of wheat was approximately 75 percent of the local retail price, that of maize 80 percent, and that of paddy about 80 percent, while the price reported for live animals -- sheep and goats -- was 60 percent of the retail price. Margins in the case of the main fruits are 40 percent; potatoes, 57 percent;and tomatoes,44 percent.

Human Resources, Labor, and Barani Agriculture

As in other developing countries, a large share of the barani population is composed of minors, less than years of age, who can be considered dependent on _____

31 Ali,Cheemah,and Ateeque,op.cit.

32 Ibid.

33These crops are highly sensitive to rainfall, and annual marketingscan vary enormously from year to year.

34 Ali,Cheemah,and Ateeque,op.cit.

adults.35 In the barani, minors are 30 percent of the total population, while the elderly, defined as those persons over 60 years of age, are 8 percent. Perhaps 90percent of the rural men seek seasonal off-farm employment. Because social custom prohibits women from assuming ful1 economic status, adult males between 20 and 60years of age, who make up 39 percent of the population, provide much of the support for the remaining 61 percent. This is not to say that rural women make no contribution. The contrary is true. The analytic and economic problem arises from the socially imposed limitations on their full participation. Women provide much of the labor for their families; they often manage the animals, help harvest crops, carry water, and do other domestic work. Women whose incomes are low work on others'farms for low wages. The situation requires that men and women perform many tasks separately that could well be shared. Women do not participate in plowing and sowing, for example, but could contribute much-needed labor at those times when the demand for labor is great, if social convention allowed it. The social price is that the agricultural system, even when efficiently managed, maximizes at a less than optimum point. Young men, usually less highly skilled, tend to earn less than older men. The relative lack of wealth of the area can therefore be explained in part by its high dependence on the young of the population.

The economically active population finds it increasingly difficult to support the dependent portion only from farm proceeds because of declining farm size, as discussed earlier in this chapter. Consequently they seek alternative or additional sources of income. Emigration has become a leading solution. Given Pakistan's low literacy rate of 15 percent, it is unlikely that many young barani adults are literate.The rural population, however, has few marketable skills, although rural nonfarming people tend to be somewhat better trained than those from farm backgrounds. In the PERI study it was found that a person from an artisan family is nearly three times as likely to have some technical skill as one from a farm family (Exhibit I-11).

The majority of young job seekers, therefore, are prepared for little more than unskilled manual labor, at least at the beginning of their careers. The focus of the discussion is training skills rather than formal education. The quality of rural schools is likely to be low and variable, with the result that few students leave primary schooling with much more than very basic literacy and numeracy. Children of artisan families are more likely to have learned some marketable skill from practical apprenticeship at home. Very few girls are sufficiently schooled in lines that can be exploited socially, and as adults very few move to the cities or off the farm permanently as workers in their own right. Some ABAD vocational training centers are to be found in barani areas, and these may help to open career doors to young adults off the farm.

35An awkward problem is presented to the analyst by the division of population by the census into age deciles rather than five-year cohorts where 15 is the age of transition from dependent to earner. The census convention is that all persons below 20 years of age are minors. A third of the decile, in fact,falls in the economically active group, above 15, and the balance, those below 15, are on the dependent list. The Master Plan follows the Census in taking 20 as the cutoff point.The convention does not affect the conclusions.

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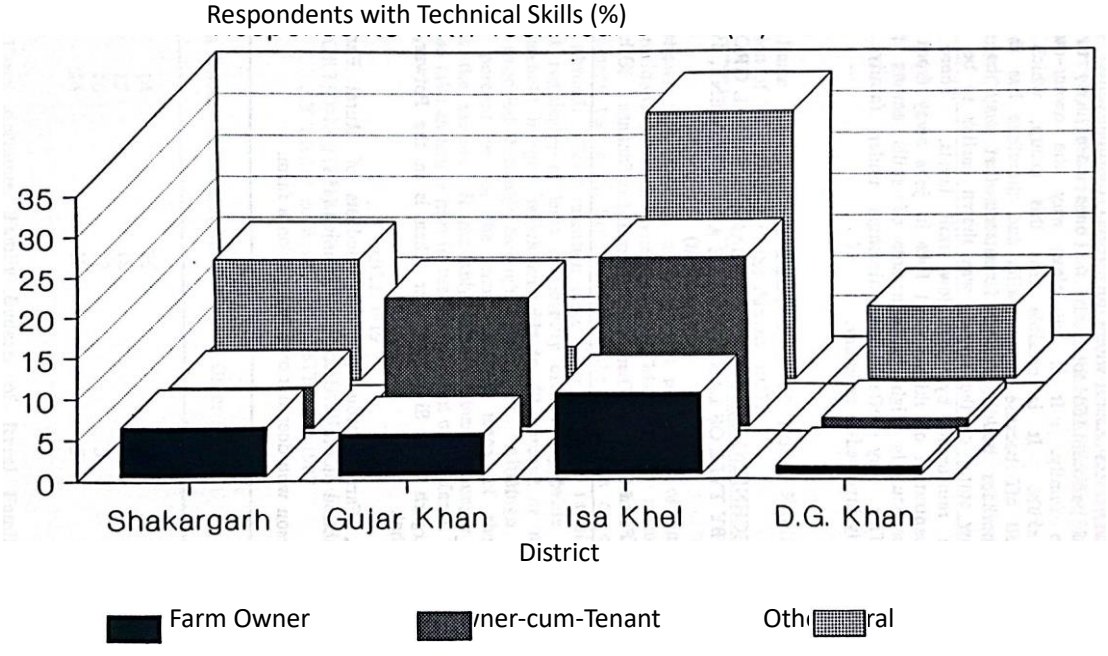
Technical Skills

among Three Rural Barani Groups



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A comparatively small number of persons have technical skills, however they are defined, and these skills vary greatly from one part of the barani to another (Table I-17, Exhibit I-11). Isa Khel, where an ABAD training center exists, has the most technically skilled persons, and these are the ones most likely to be the nonresident members of the family. It is not clear why the owner-cum-tenant class has relatively high skills. It is possible that this group, which hires in land, is comparatively well off because it has skills and therefore has the money to engage in agriculture, perhaps building small farmsteads that may be in their possession.The relatively low status of the tenants was shown earlier to be linked to their lack of land and is reinforced by their low skill levels. There is, furthermore, a comparative concentration of skilled rural folk in jobs away from barani areas (Table I-18), and a particularly high concentration of skills among persons of nonfarm background. This may reflect apprenticeships under family tutelage, for their families are usually involved in artisanry.

TABLE I-17

TECHNICAL SKILLS AMONG BARANI RURAL GROUPS,
BY TYPE OF LAND-TENURE ARRANGEMENT,1987
(percent)

District	Farm Owner	Owner-cum-Tenant	Tenant	Other Rurala
Shakargarh	5	5		15
Gujar Khan	5	16	4	4
Isa Khel	10	21	6	33
D.G.Khan	1	1		9

Note: Shakargarh is in Siwalik, Gujar Khan is in the Potwar, and Isa Khel is in the Thal.

Source: PERI, Farm Accounts, Family Budgets of Rural Families, and Cost of Production of Major Crops in the Punjab (1987).

A person who does not own or work on a farm.

TABLE I-18

TECHNICAL SKILLS AMONG NONRESIDENT BARANI RURAL GROUPS,
BY TYPE OF LAND-TENURE ARRANGEMENT,1987
(percent)

District	Farm Owner	Owner-cum-Tenant	Tenant	Other Rural
Shakargarh	18	45		22
Gujar Khan	9	43		75
Isa Khel	25			33
D.G.Khan		33		99

Source: PERI, Farm Accounts, Family Budgets of Rural Families, and Cost of Production of Major Crops in the Punjab (1987).

Table I-19 shows that there is an important proportion of rural skilled persons not permanently resident at their homesteads. "Male family members not resident"refers to members of rural households who do not work on the farm or engage in other rural employment but work instead in neighboring towns or cities, elsewhere in Pakistan, or even abroad. They maintain close links with the family and supply cash remittances, if not regularly, at least sufficiently often to provide an important part of the annual household budget, which amounts to 40 percent or more of total rural household income supplied annually through remittances. Although nonresident skilled labor is only 15 percent or so, the share includes many of the best-trained and ablest people from the sector. It probably includes many younger heads of families who would otherwise take an active part in the management of the farm.

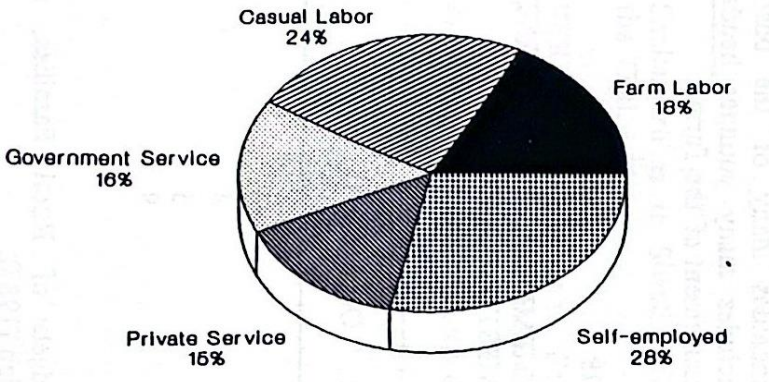
TABLE I-19

PROPORTION OF MALE FAMILY MEMBERS NOT RESIDENT
AT THEIR BARANI HOMESTEADS,1987
(percent)

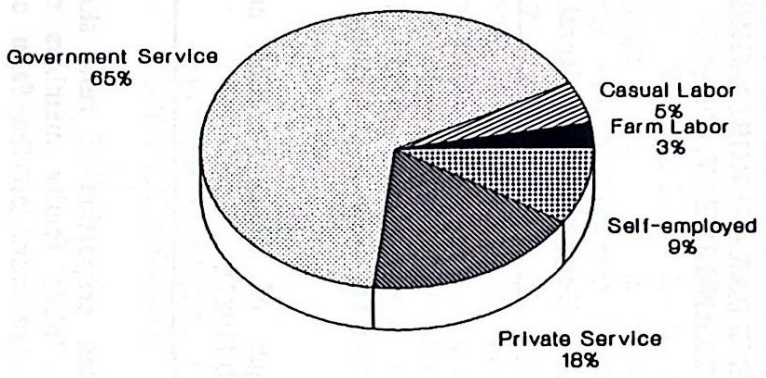
District	Farm Owner	Owner-cum-Tenant	Other Rural
Shakargarh	14	26	20
Gujar Khan	15	18	4
Isa Khel	16	12	5
D.G. Khan	14	12	9

Source: PERI, Farm Accounts, Family Budgets of Rural Families, and Cost of Production of Major Crops in the Punjab (1987).

Types of Employment of Rural **Emigrants for Resident** Farm Owner



for Nonresident Farm Owners



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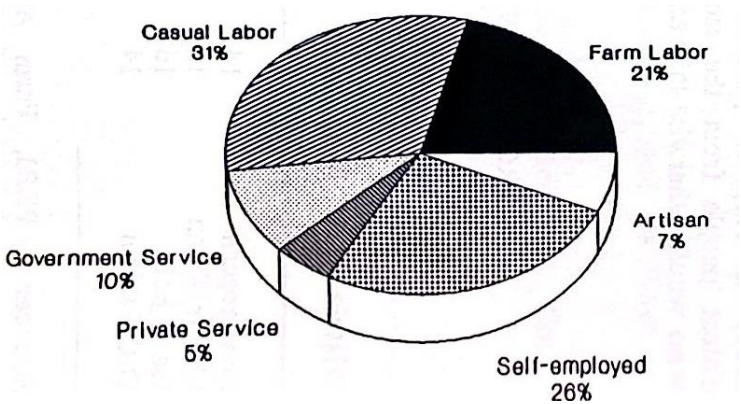
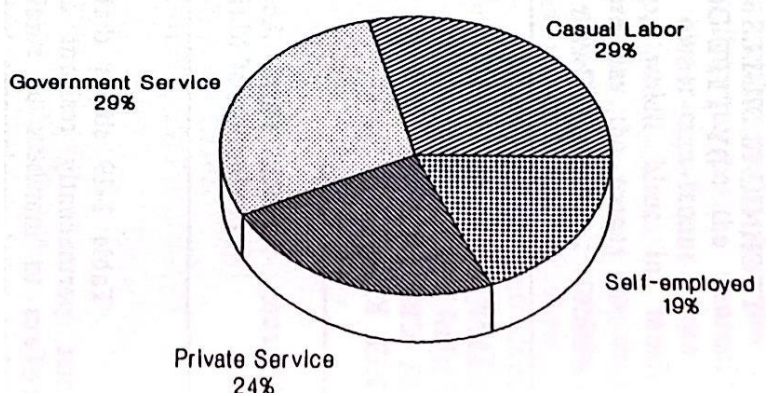
for Non-farm Owner Residents



for Non-Farm Owner Nonresidents



In addition to nonresident off-farm workers, perhaps 90 percent of farm men annually find short-term employment closer to home, probably in a pattern that conforms to the seasonal demand for on-farmn labor, according to the PERI study.Stay-at-homes can either commute or work for longer periods off the farm while not putting down sufficient roots to become permanently resident away from home. For some it is perhaps the first step toward a long-term commitment. It is not clear why there are variations in off-farm residence among the rural groups studied. In the case of artisans, it may be that in many instances good local options exist, so fewer of them seek employment away from barani areas.

What sort of off-farm work can be found? Jobs available to rural men vary somewhat between what can be found at home and what can be found away. Of those who stay at home, 42 percent tend to work in unskilled or semiskilled short-term jobs, while emigrants take such jobs only 8 percent of the time. Jobs with the government, including the army, and jobs abroad, for 4 percent, can be obtained only by those having fairly high skill levels and education (Table I-20, Exhibit I-12).

TABLE I-20

TYPES OF EMPLOYMENT FOUND BY RURAL EMIGRANTS
FROM BARANI AREAS
(percent)

	Farm Owners		Nonfarm Rural	
Type of Employment	Resident	Nonresident	Resident	Nonresident
Farm Labor	18	3	21	
Casual Labor	24	5	31	23
Government Service	16	65	10	23
Private Service	15	18	5	19
Self-Employment or Artisanry	29	9	26	15
Business			7	

Note: Columns may not add to 100 because of rounding.

Source: PERI, Farm Accounts, Family Budgets of Rural Families, and Cost of Production of Major Crops in the Punjab (1987).

Some interesting behavior is illuminated in Table I-20. Why does government service, which includes the army, attract so many farmers and so few artisans? The possession of skills, including the management of small businesses, may explain why it seems easier for persons of artisan background to move into private service, as Exhibit I-13

paid employees, and into self-employment. But lack of rural opportunity for artisans may explain their presence as casual labor and as farmn workers.

Where do these people work? Of the job seekers from the farm, 63 percent stay fairly close to home and remain a permanent presence on the farm.Only 4percent of the farmers leave the country (Table I-21, Exhibit I-13).

TABLE I-21
LOCATION OF JOBS **FOR RURAL BARANI JOB SEEKERS**
(percent)

	Farm Owners		Nonfarm **Rural**	
Location	Resident	Nonresident	Resident	Nonresident
In Home Village	38	--	71	3
In a Neighboring Village	25		13	— —
In a Neighboring City	37	22	14	17
Away from Home but in Pakistan		74	2	70
Abroad		4		10

Source: Ali,Cheema,and Ateeque,Marketing of Farm Products and Farm Inputs in "Barani" Punjab and NWFP, No. 176 (Lahore: PERI, 1979).

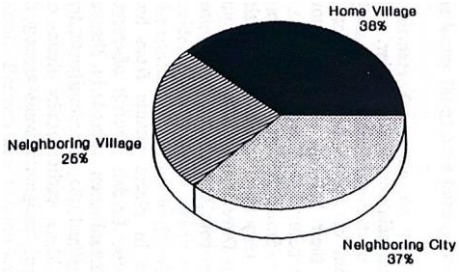
The PERI findings show that comparatively few barani men work abroad.Furthermore, although leaving the farm for work, a large majority are not being lost to the farm because they continue to return for the harvest. From the point of view of the loss of able persons, an important segment may become permanently separated, but for this generation at least, close links persist, to the benefit of the farms.

Almost no farms offset out-migration by hiring long-term workers. The need for short-term labor is satisfied by the employment of casual workers on a day-to-day basis. Indeed, the cyclical pattern of work demands on a farm -- peaks of intense need followed by months of underemployment -- may go some way toward explaining the trend toward off-farm employment.

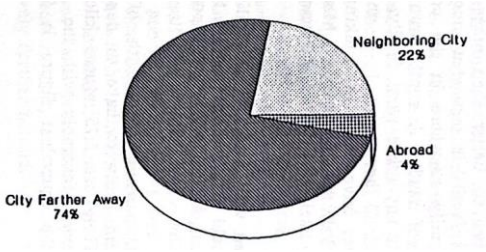
EXHIBIT0

Location of Jobs: **Rural Seekers**

for **Resident** Farm **Owners**



for Nonresident Farm **Owners**



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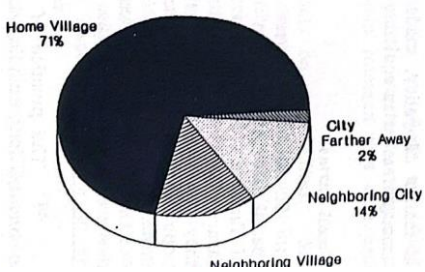
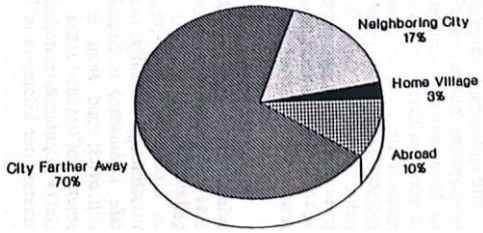
for Resident Non-Farm Owners



13%

for Nonresident, Non-Farm Owners



Quality of Life

Barani people appear, on the average, to live no better than other Pakistanis,but they are not significantly poorer. The barani family is somewhat more likely to live in an owner-occupied brick house than a family elsewhere in the country,but the house will be smaller and the bricks will be of mud. A rural barani family is almost as likely to have an electrical connection as any other rural family. Kerosene remains the primary source of illumination in barani homes, so it is an important purchased item. Only 2 percent of barani homes have piped-in drinking water, a figure that compares closely with the Punjab and Pakistan as a whole. Many families have access to indoor hand pumps and are more likely than other Pakistanis to have them.

The barani zone appears to be as well served with basic health facilities as the province of Punjab. Life expectancy figures could not be found, but there is no reason to expect them to be significantly different from those of the population at large.

Although equally well served by highways, measured in length of road per square kilometer, a barani village or farm is more likely to have to depend on an unimproved road than is one in the Punjab. There are 8.75 square kilometers per kilometer of road in the barani area, which compares favorably with the much more densely populated remainder of Punjab, where the equivalent figure is 8.15 square kilometers per kilometer of road.

Two factors explain the relatively narrow gap in incomes and infrastructure between the canal command areas of Punjab and the rainfed districts of the province. First, the steady inflow of off-farm income provides an important a matter of policy, made sure that investments in infrastructure have been allocated among areas on an equitable basis.

Small Farms

Small farmers were singled out for special mention earlier. They deserve special note because they represent the bulk of the rural community and the majority of farmers. No program for the development of agriculture can ignore them. Small farmers stand out by virtue of the size of their holdings and the amount of income they can earn from their holdings. Probably no other segment of the rural population has attracted so much attention. Small farmers have been variously and unjustly characterized as inefficient because they are small and tradition bound and because they are technically conservative. Development schemes routinely relegate the small farmer to the status of passive beneficiary and others seek to act as _____

36 The practice of taking employment in places remote from home appears to be one of long standing and dates back to the British practice of recruiting"martial"peoples for the old Indian army. Many barani men served in the army and even abroad. Barani men, as a consequence, have had the opportunity to travel, gain new skills, and become acquainted with new ideas earlier than their more sedentary fellows. The practice has continued. Barani emigrants were among the first to be attracted to the opportunities of the Middle East.

spokesmen for small farmers because they are ignorant or uneducated. For all these reasons, programs tend to do things to them and for them rather than with them.Many small farmers have in fact been found to be technically efficient while poor because of an absolute lack of resources. In order to survive small farmers must be good -- or at least better than adequate -- farm managers. Experience has taught them to be cautious. Their conservatism is more often the result of deliberate calculation than of ignorance or timidity. Where they have good land and water and are well located, many small farmers can earn good incomes from high-value crops.

The drafters· of the National Commission on Agriculture defined barani farms having less than 25 acres as small and those having less than 12.5 acres as particularly vulnerable. By these measures, 90 percent of all barani farms are small,and 72 percent are vulnerable.

Studies have shown that smaller farms are often efficiently managed, have a high land use and crop intensity, and can be highly productive per acre. What, then,makes small farms particularly vulnerable? Leaving aside the portion of small farms that are poorly located, have less than adequate management, and thus would have a difficult time under any circumstances, the remainder face a number of constraints to cope with which is in considerable measure beyond their separate capacities. Because of these constraints small farms are routinely less well able to participate in government farm-promotion programs that benefit larger, better-placed farms. One consequence is that, for a number of reasons, an important number of farms fall progressively further behind.

Smaller farms in the barani tend to grow a somewhat different mix of crops from that grown by large farms. This may reflect calculations by the farmers of maximum returns per acre at an acceptable level of risk, low input requirements, and acceptable demands for labor, where labor may be active in off-farm work. It may also reflect particular efforts at self-sufficiency. In addition to wheat and fodder crops, their crop programs include edible oil seeds, such as mustard, pulses, and maize. None of these crops has received the attentionfrom research that cash crops grown by the larger farms have been given.

Small farmers frequently do not use improved inputs on their farms. Small farmers, some argue, often lack information regarding sources of important inputs.Indeed, they lack information generally. This is in part the result of weak extension support and an extension system that is not geared to their special needs.

Small farmers typically lack money for investment, since it is easier for the large farmer to find money than for the sma11. Thus even when fertilizer and custom traction are available, small farmers are in less of a position to buy.Whereas many men from these farms do find off-farm work, it is believed that most of their earnings are used to supplement the inadequate consumption that the farm is able to provide. Government credit programs are only exceptionally able to reach this class. But another reason has to do with local social status.

Small farmers in the barani may often be members of subordinate or less important classes, castes or clans within a given village setting. In a society in which personal status counts, an inferior social position can be a serious liability.Weak social status affects other aspects of a person's situation as well. It may hinder one's access to modern inputs. Small farmers find it difficult to organize on their own behalf. Because they lacking local spokesman of standing from their own

behalf. Because they lacking local spokesmen of standing from their own ranks,those higher up the social scale often act on their behalf in village and other councils and development forums. Concerns that conflict with those of stronger groups probably do not receive a fully balanced hearing in such circumstances.

Barani tenants may be better off than fully independent small farmers in a number of ways. Because it is in the landlord's interest, tenants are often provided with fertilizer and custom traction paid for with a line of credit to be repaid at harvest time. The landlord makes sure that the tenant receives whatever extension has to offer, since extra production by the tenant is the landlord's gain as well.

Many small farms can be made more productive and prosperous where these constraints can be overcome. Different types of small farm require different solutions. The extremely small may be especially difficult to reach, because they lack a sufficient land base. In such instances, special programs may be required for farms that have less than five acres, to offset their special weaknesses. It seems clear that small farmers will require imaginative, broad-gauge support to be able to offset their many constraints.

There are two solutions to the problem of making smaller farmers more productive.37 Either yields per acre on smallholdings must rise, or smallholdings must in some way be consolidated into larger management units without alienating basic ownership. New technologies will require consolidated tracts of land on which to be applied, if their full potential is to be realized. If smallholders, for reasons of status or attachment to a way of life, cannot sell to allow other among them to grow, and if cooperative mechanisms that involve many small landowners cannot be made to work, then some new form or forms of practical integration must be found.

IMPLICATIONS OF FARM-LEVEL INTERVENTIONS UNDER **THE MASTER** PLAN

In this section the economic implications of some interventions in the production of target farm enterprises indicated in the Master Plan will be examined.Where the crop is already important, the effects may be felt well beyond the farm,touching incomes, investment, employment, the demand for and delivery of inputs,the production of substitute goods, and possibly prices, if marketed supplies are large

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37Emigration, although it provides additional income, does not increase on-farm income; indeed, it is a symptom of the lack of viability of the farms.Emigration,however, has helped to add a new aspect to the problem. Remittances from emigrants used in part to buy land, raising land prices.

enough to be economically important.38 Wheat is so important in barani diets and figures so large in crop programs that an analysis of the effects of a typical wheat-centered program can provide valuable insights, both on-farm and off-farm. The economic analysis therefore will be centered on wheat, which is being used as a model to estimate effects on farm incomes for crop production projects.

In the following analysis the concept of a basic viable farm unit, one that is able to meet subsistence needs in several local environments, will be developed first.The exercise will demonstrate the wide variation in farm types that there are in the barani and provide a point of reference for subsequent analysis.

On the basis of this model the distributive implications of intensive crop promotion will be examined, using a wheat project as an illustration. Assumptions will be made regarding differential patterns of consumaption among income classes,reflecting the distribution of farm sizes and thus basic earning capacity. Using these assumptions, the implications of a doubling of wheat yields for farm income,employment, the demand for inputs, home consumption of wheat, the marketing of wheat, the annual crop program as a whole, and the demand for superior goods --notably dairy products -- and will be considered. These findings vary by income class with important implications for equity and other subjects.

Following this analysis, 11 budgets, representing farm management systems in four zones of the barani, will be used as the vehicle for study of the effects actual employment and income of changes in technology and prices. Three enterprises,wheat, dairy and oil seeds, will be examined.

In Part Four the implications for research and the design of crop production effects of criteria developed under farm systems research will be evaluated.

The Basic Barani Farm

The zonal discussions in the other volumes of the Master Plan make clear the extent of physical diversity -- in rainfall, soils, and location, for example -- to be found within the barani tract, which has led to varying levels of productivity for farms in different zones. Standards of comparison among farms have limited programmatic meaning but are useful in analysis. Barani farms are at the root of what has traditionally been a self-sufficient agricultural society. A useful standard,therefore, which links physical diversity with production technology, is a comparison among the widely different scales of farm required in various parts of the barani for a farm family to satisfy its basic subsistence staple cereal needs. Such a comparison provides a useful if simple measure of the effect on welfare that could follow from interventions in crop production technology in barani areas.

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38 "Economically important" means sufficiently large to affect the price level. Technically, this would happen as a result of a shift in the supply function,indicating a change in production technology introduced under the project. In the case of wheat even large increases locally are unlikely to affect prices, because national production is so large in absolute terms and the good is essentially homogenous. A substantial change in the production of oil seed,however,could have such an effect, the increment being added to a comparatively small base. In this instance, a decline in price would cause an increase in the real incomes of consumers, with important implications for the consumption of agricultural products and others.

It is possible to calculate a minimum farm size for different locations in the barani,using restrictive assumptions. The strongest assumption needed to remove all variations in local farm practices from the calculations is the dedication of all the cultivable land of a farm to the production of wheat, using conventional technology.The results are shown in Table I-22, together with the underlying assumptions. They show a wide variation in basic farm size, indicating differences in moisture available for rainfed agriculture in different areas. A farm family in Sialkot -- with 7.1members, on the average -- in the north extreme of the barani, would have to use less than half the land (4.4 acres) for subsistence than would be required by a family of similar size -- 7.3 members -- in D.G. Khan in the south (9.9 acres), reflecting lower productivity. Farms using conventional practices and varieties, in the Potwar -- the northwest -- need 5.4 acres on an average to sustain themselves; the average family in the Potwar has 6 members.

TABLE I-22

MINIMUM VIABLE FARM SIZE IN REPRESENTATIVE BARANI DISTRICTS

District	Annual Yield (Kg. per acre)	Annual Cost of Seed (Rs per acre)	Annual Cost of Harvest (Rs per acre)	Annual Residual Yield (Kg. per acre)	Annual Needs for Sub-sistence (Kg. per acre)	Minimum Farm Size Required for Sub-sistence (Acres)	Ratio of Farm Area to Culti-vated Land	Minimum Farm Size Requi red for Sub-sistence
Sialkot	410	40	90	280	1,166	4.2	1.1	4.4
Gujrat	354	40	78	236	1,035	4.4	1.2	5.3
Rawalpindi	408	40	90	279	1,068	3.8	1.3	5.1
Attock	339	40	75	224	986	4.4	1.2	5.5
Jhelum	375	40	82	252	986	3.9	1.4	5.6
D.G. Khan	247	40	54	153	1,199	7.9	1.3	9.9

This table depends on the following assumptions:

a. One adult person consumes 450 grams daily or 164 kilograms. annually. This was multiplied by the average farm size in the district to give the annual home use needed.

b. A farmer reserves 40 kilograms per acre a year for seed.

c. The cost of harvest and threshing is reflected in a reduction in yield of 22 percent.

d. The average yield of rainfed wheat is calculated for a five-years period, 1978-82.

e. The minimum wheat area is that area sufficient to supply the family its subsistence consumption needs for one year, with nothing left over.

f. The ratio of farm area to cultivated land in the district times the minimum wheat area gives the minimum farm size, because not all the area of a farm is cultivated.

When these figures are compared with the distribution of farm size it becomes evident that considerable numbers of farm units would not be viable as sole sources of incomes and fall below the minimum subsistence line. In the case of the Potwar in 1980, where total agricultural land conforms most closely to rainfed farm land, 15percent of the farms in Attock, 18 percent in Jhelum, and 35 percent in Rawalpindi are nonviable by this test.39

Although they permit interzonal comparison, the cross-district figures understate the case. In practice, farmers using traditional technologies are unable to devote all their land to a single subsistence crop. If they did, their yields would soon begin to decline as the monocrop regime wore out the soil. Subsistence farmers cultivate a wide range of crops during two seasons, and they have small herds of animals as well. This will be called a balanced farm. Some land is left fallow. For a subsistence farm to survive through the long term, therefore, it would have to be several acres larger than the theoretical minimum, depending upon the area. In the Potwar it is likely that a balanced subsistence farm would be somewhat larger than 7.5 acres, in which case a much larger proportion of farms would be nonviable in the long run: 29 percent in Attock, 34 percent in Jhelum, and 54 percent in Rawalpindi.Most owners of owner-managed farms smaller than 7.5 acres whose production technology did not change would sooner or later have to look for income opportunities off the farm in order to survive (Exhibit I-14). Tenant farmers,who must pay up to half of their crop in rent, are in an even worse situation.40 In Rawalpindi nearly all the tenants would have nonviable farms by this standard, while in Attock the proportion is 75 percent, and in Jhelum it is 90 percent.

An equivalent calculation can be made in the case of livestock, providing an estimate of the number of animals -- say milch buffalo -- that could be maintained were all of the land resources of the farm devoted to their support. This calculation shows that if all rabi land were planted in fodder, including oats, and if all kharif land were planted in, say, sorghum, a 6.5-acre farm could support 3.5 buffalo.41This herd would produce 3,247 liters of milk, assuming 260 lactation days and a daily production of 3.6 liters per head. Small farms such as this typically own from one to two head of buffalo. The analysis demonstrates that these farms cannot increase milk production by a significant amount, because they have limited ability to improve fodder crop production and still support subsistence needs. Once again, the need for off-farm employment becomes evident. Increased animal production means either unprecedented specialization or stall feeding of buffalo with purchased feed supplements, such as cottonseed cake.

The foregoing analysis, however unrealistic in itself, underscores the need by smaller farms in particular to:

Diversify their income sources;

39Approximately 90 percent of the farms in the three districts of Rawalpindi Division in 1980 were rainfed, while 24 percent in Sialkot and 1 percent in D.G.Khan were rainfed.

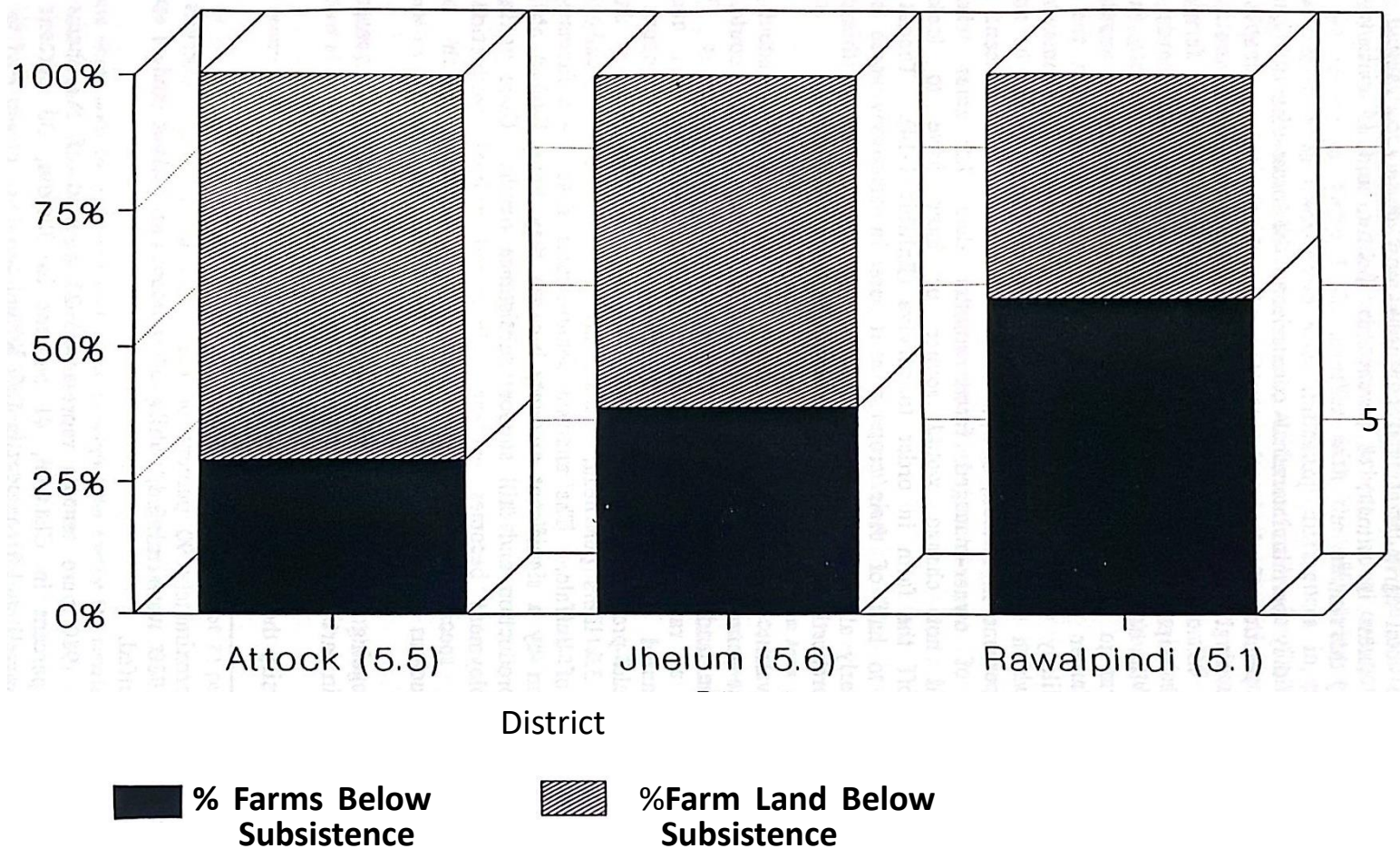
40 In 1980 pure tenants represented 23 percent of the farms in Rawalpindi division, 37 percent in Chakwal, 41 percent in Jhelum, 30 percent in Gujrat, 55percent in Mianwali, and 51 percent in D.G Khan.

41 Analysis by the Master Plan team. For more information, see the discussion of livestock and range management in Volume Four.

EXHIBIT I-14

Proportion of Owner-Operated Barani

Farms Below Subsistence



()=subsistence farm size, in acres

· Shift to more productive new technology;

Increase productivity per unit; and

Begin to specialize, which would mean a hastening of the movement away from self-sufficiency to self-reliance.

The analysis puts in relief also the structure underlying the growing rural "push." It is likely that inadequate farm size provides much of the impulse that propels rural people to move to cities. The size of families dependent upon land -- and ultimately, the number of people among whom the farm must be divided -- grows.Fragmentation and population work continuously to swell the number of nonviable farms.

Distribution and Other Effects of a Change in Agricultural Technology

In this section the probable effects of a change in agricultural technology for farmers will be traced, with particular note taken of the consequent effect on the demand for inputs, employment, marketing, distribution of income, and consumption behavior; then will follow a discussion of the implications of the analysis on the design of technical packages for barani farmers. The crop studied is wheat, the primary staple. For the analysis it is assumed that a project successfully introduces a new wheat technology that in effect doubles yields as a consequence of the acceptance of a technical package that includes fertilizer, seeds of a new variety,some tillage practices, encouragement of custom tillage, and an herbicide. It is assumed further that farms can accept all or part of the divisible package, depending on their individual means, so diffusion of thetechnology is not constrained by lack of investment or working capital.

Divisibility, as it used in the present context, refers to the ability to use a technology in small increments and still obtain a useful result. The best example is fertilizer. A farmer may apply a part of the package -- say, a portion of the recommended fertilizer input -- together with a new seed and supporting practices to all or part of an area to be planted. The farmer will realize a portion of the potential of the variety, output being lower than it would be the full package were implemented. Conversely, an indivisible input is typified in the application of gravity flow irrigation water, which, to be used effectively, can only be applied onto nearly level fields. Leveling is a basic investment that must be made before irrigation water can be used. A tractor is another example: With the growth of tractor rental, the tractor utilities have become a constraint; plows, chisels, and the like are lumpy investments to the tractor owner. The purpose of this section is to direct attention to component parts of the rural economic structure and suggest the nature of some of the interactions among economic variable that are of interest to the Master Plan.

A subregional Master Plan bears within it inherent limitations that must be recognized and included in assumptions underlying projects designed toward its implementation. Planners at the subregional level have no direct influence -- and the Plan no automatic influence -- on national economic policies such as price,taxation, subsidization, and trade. A subregional Master Plan cannot, for example,assume on behalf of the central government a set of policies uniquely designed to its own benefit. The problem of rural unemployment, for example, cannot be solved using an employment promotion policy supported through the central subsidization of labor-intensive technologies, because it would be difficult to target only rural populations. Neither can income stabilization for barani areas be attempted by means

of a centrally managed price-control system. In both these instances, the effect of such policy changes on the whole province -- not only barani areas -- must be seen.The subregional planner must look to other devices to reach these kinds of goals--unless,of course, the subregional, and national policies can coincide.

A subregional Master Plan reaches its intended beneficiaries through projects that fit into broader programs and regional objectives. One way to affect the incomes of barani farmers is through projects that promote the production of a crop,such as wheat. These projects offer producers the incentive of incomes directly proportional to their level of production. Depending on the commodity, this production is sold at a price determined by a market, a fixed price, or some combination whereby the market determines the price above a fixed level. Wheat is sold in Pakistan at a market price closely linked to a fixed floor price. Wheat is Pakistan's main cereal; the barani produces only a fraction of the national product.Any one project would affect no more than a fraction of the barani producers,at least at the outset. The increased product, therefore, would be economically "small,"its total effect on national production being insufficient, at least during the "life of the project," to affect prices through shifts in an aggregate supply of wheat.Projects can therefore help beneficiaries by increasing their incomes -- directly as wages or revenues from sales, or less directly as secondary benefits, such as improved fodder crops for their animals.

Consumers, producers, and owners of factors of production, will be affected more by changes in income brought about by the program than by price variations -- probably modest -- induced as a consequence of these changes. It is important to examine effects of a growth in real income rather than money income.42 If project interventions cause a significant increase in prices, the effect of any improvements in money income it may have induced will be lost. Wage goods figure large in the basic expenditures of working-class and lower-income groups. In Pakistan purchases of cereals take up a relatively large share of a workers' wages. A reduction in price of a wage good, for any reason, can have important pro-employment effects. A change in the price of cereal has a large effect on family budgets, permitting either an increase in its consumption or reallocation (from the income effect) to a preferred good. It takes time for the effects of a change in technology to work themselves through an economy, reaching first a small number of innovators or risk takers, then spreading to a larger number of producers, and then affecting sellers of factor services and consumer goods,gradually reaching more and more people.

Technological Intervention

Projects that help farmers produce cereals using new technology may be one of the most important policy tools available to the subregional planner.

In the following the sections the rippling effects that spread out from a technically centered wheat production project in the northern barani, an area where rainfed production of wheat is an important part of farm programs,will be traced.

42Money income (Y) is divided (deflated) by price, or a price index (P),to obtain the true purchasing power or money income (Y/P). Price policy works to affect real incomes through an effect on P, and it affects everyone, albeit disproportionately. The production output of projects, being typically "small"economically,influences the ratio through Y.

It is assumed that a change in production occurs during a period of stable wheat prices and comparatively full employment of labor and that the package, if fully applied, will double wheat yields. The farm program is conventional -- in rabi,wheat,and fodder, in kharif, sorghum, vegetables, and pulses. The distribution of farm sizes will be assumed to be similar to that prevailing in Rawalpindi District.43The bottom 54 percent -- less than 7 acres -- are marginally viable or subviable farms under the preproject technology. Technological change can have different effects:

Producers may reap the benefit of lower production costs, thereby possibly increasing their incomes, and consequently,their consumption;and

Consumers may reap a benefit lower prices, assuming limited price control,because the price of wheat would be expected to decline. The decline would be because of an anticipated increase in the supply of wheat or reduction in its cost of production.

By increasing returns per acre, the new technology will reduce the size of the minimum viable farm. Farm budgets for typical barani wheat farms will be introduced later in this volume, and the effect of these changes will be tested to determine income effects on the farms.

Production Effects

Success in the adoption of a new technology and the rate of its adoption are in large measure determined by the quality of the design of the technical package. The more divisible the package, the easier its mastery will be, the simpler the acquisition of the components, the faster its diffusion, and thus the faster its effect on incomes and employment. A technical package is.likely to become widely adopted if it can be adopted in pieces, in which case it can produce a profitable return, its cost makes it affordable to the farmer, and its mastery does not require important digression from known methods. To the extent that a new technology depends on a "lumpy," high cost, investment, such as a tubewell, land leveling or land forming, or deep plowing its acceptance will be skewed toward richer, less risk-averse -- and probably larger-- operators. A project may provide a credit "window" to assist smaller producers to buy the input individually, or it can attempt to get around the constraint through an organization,permitting some form of group access.

If a new technology requires superior seedbed preparation, including possibly periodic deep plowing, steps will have to be taken to solve the fragmentation problem. If, for example, a new technology requires a little-known input such as herbicides, some extension help may be necessary. Similarly, the inclusion of very small farms would require that special actions be taken. In some instances a project

43 The proportionate distribution of land in Rawalpindi District is (1980):

<25.0 acres,12%
:>25.0->12.5 acres,16%
:>12.5->7.5 acres, 18%
:>12.5-> 5.0 acres,19%
:>5.0->2.5 acres,13%

would have to consider "management" solutions, under which some practices,such as seedbed preparation, would be applied across local boundaries, requiring owners to yield at least part of their managerial prerogatives to a contractor or a growers'association. It is assumed that farm organization and management methods are unchanged and that farms continue to operate as separate entities. If this assumption is relaxed as a consequence of project intervention, then patterns will of course shift, reflecting a change in the scale of the managed farm unit. No mention has been made of land reform in this document. This is not an oversight. The policy is not one that can be initiated at a subregional level.

If a project has the aim of producing large marketable surpluses early, it will be easiest to focus on the larger producers, who will have the needed operating capital and access to inputs, markets, and credit lines. The technology would therefore affect the top 28 percent of the farms in the target area. To the extent that a project is intended to widen the production base and affect incomes of a larger number of producers, as well as to make more small farms viable, then the character of the package will become paramount, and supplementary systems will become necessary where the package is deficient. As the package is made more divisible, up to 50 percent of the farms will be eligible, bringing farms as small as five acres into the fold. Even then, the smallest farms, say, the bottom 10 percent,would be able to buy into at least some portion of the package, such as seeds and some fertilizer. It is important not to lose sight of the consumption needs of the smallest farmers, which must be satisfied in large measure from off-farm income.The greater this dependence the less income will be left over for the purchase of inputs. This group of farms, therefore, will probably require some credit support if they are to be able to participate in the wheat project.

The new technology will require a greater investment in inputs but will reduce the cost of output per unit of input. Such a technology has the effect of increasing returns to the farmers, while changing returns on land, labor, and capital, as factor proportions are changed. A farmer can capture the potential in two ways, which are not mutually exclusive. First, the intensity of effort per unit of land can be increased. Second, the cropping patterns can be reshuffled -- with effects throughout the calendar year -- adding more acres to wheat, at least in the short run. Either action will have important implications for the demand for each factor of production. The increased value added provides extra income to be distributed to owners of these factors. Land values may rise, for example, and it may become worth while to hire more labor.

Some technological changes increase the returns on labor, others do not.Fertilizer, for example, increases yields, possibly causing more labor to be needed for the harvest and thereby increasing the demand for labor.Similarly,some mechanization, by increasing the ratio of cropped land to idle and increasing yields,has the same effect. By reducing the duration of a crop, a change in variety may also increase the returns on labor by allowing a second crop to be planted, thereby increasing cropping intensity and the total output per acre.

Income Effects

Farmers who adopt the technical packages offered under the aegis of wheat projects will increase their money incomes. All adopters will have more wheat, but cash incomes will depend on marketing. Depending upon their income classes,farmers would market varying proportions of the supply. The smaller and poorer the producing unit, the larger will be the amount of the increment consumed on the farm. In practice the farms are not subsistence units, and many receive significant

off-farm incomes. Farms of all sizes are likely to have some access to nonfarm incomes. To the extent that remittances are a factor, the propensity to consume home-produced grain will be greater than in the subsistence model. Larger producers -- say, those that have more than 7.5 acres -- would market a substantial amount of the wheat grown; farmers having, say, 15 acres, would market almost all. A fully divisible package would provide farmers with holdings of all sizes the opportunity to add something to their incomes, either in cash or in the form of a better subsistence living.

Consumption Effects

A fundamental technological change in production of a basic staple such as wheat,grown by virtually every farmer, will usually put income into the pockets of everyone who adopts the new technology. Farmers will enjoy an increase in real disposable incomes in proportion to their marketing, and these are likely to be correlated to the sizes of their farms. An important share of the increment will probably be spent on superior -- more expensive -- goods, the actual share depending on the absolute size of their total household income. These changes in income should be estimated. Economists often classify goods according to their income elasticities, which show the ratio of the percentage change in quantity consumed, divided by the percentage change in income. Income elasticity measures the effect on consumption of small changes in income. A staple, such as wheat, that is classified as a necessity, is reported in the Report of the National Commission on Agriculture as having an income elasticity of 0.19 to 0.29. If income increases by Rs 100, consumption of wheat will increase by Rs 19-29. Dairy products, another staple,are found in the 0.66 to 0.80 range. Other examples are edible oils (0.89 to 0.99)and pulses (0.00 to 0.50). Superior, or luxury, goods have elasticities higher than 1.Examples in agriculture include meat (1.40 to 1.70) andfruit (1.11 to 1.30). Housing in Punjab could conceivably have an income elasticity of 2 or 3, and an electric good, 2. A few goods have negative income elasticities. An example might be a very coarse grain, such as millet or sorghum, eaten only. when all else is exhausted (-1.00 to -0.30).44 Some agricultural commodities, such as meat, dairy and milk products, fruit and vegetables would clearly be beneficiaries of technological change.45 The effect on these goods of an increase in demand may be to raise their prices locally, which would in time act to increase production of them until diminishing demand halted the price increases.46 Superior goods tend to be labor-intensive; increased local demand would therefore have an employment effect and, in

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Pakistan.Elasticity numbers are reported in Pinckney, et al., The Wheat Economy of

45Much meat comes from sheep and goats. The main source of food of the small ruminants is the range. In an improved cropping pattern, fodder crops may be grown for small ruminants.

46 This argument is speculative. Its strength lies in the degree to which a commodity is perishable and in the effectiveness of regional market channels. The more effective the market channels the less likely it will be that prices will rise significantly. In the absence of refrigeration for perishable commodities, such as milk and vegetables, local prices may be affected by increased local demand.

time, bring about a further round of income and consumption effects. Farm laborers tend to be poor and eat mainly staple foods.47

A secondary set of beneficiaries may be found in the marketing system. Most farmers sell part of their wheat crop, so they have already established contact with market outlets. Transporters, jobbers, and agents at various levels will all gain some share from the extra volume of trade and spend part of it upon superior locally produced agricultural products.

Employment Effects

Employment generation will depend upon the particular labor demands of the technical package. Some inputs such as fertilizer and seed, increase yields, thus increasing total production and the demand for labor. Other inputs, such as equipment used to mechanize production, have less clear-cut effects. Although the introduction of tractors would decrease the demand for manual labor, it might create new employment opportunities. On the one hand, harvest and threshing equipment are almost certainly labor-displacing; on the other, crop varieties having shorter duration than present varieties make a second crop possible, requiring more labor over all.

Employment will also be affected in related service and other supporting industries and subsectors. If the private sector is engaged in providing services to agriculture, considerable productive employment will be created among tractor drivers and mechanics as well as suppliers of fuel, parts, and the like. This input delivery system will include its host of clerks, dealers, bookkeepers, and transporters; in addition, both inputs and outputs must be handled by buyers and traders. Changes in employment will affect the types of skill needed.

A change in technology may bring about profound changes in the cropping pattern, which is one of the most important factors influencing agricultural labor requirements. Because of the magnitude of the agriculture sector, it can therefore be one of the most important determinants of overall employment in a low-income country. A wheat-centered technological change may increase the relative value of the crop, causing it to displace some fodder. This can be illustrated in the case of milk. Milk, a superior good, will probably be an early beneficiary of higher incomes.Local production will have to meet part of an increased demand because of the absence of an integrated milk-marketing system. Extra buffalo will be added to the herds. Each extra animal will need extra fodder to support it, which will have to be taken from some crop other than wheat -- or, alternatively, fodder yields will have to be raised or feed supplements purchased. The shift would likely be at wheat's expense. Each buffalo will require labor-using care as well, cutting and transporting feed, watering, milking, and so on. Higher incomes may affect the kharif crop program as well through greater demand for summer vegetables, meat, and dairy products.

47This point is nicely illustrated in eastern Punjab. Here, the top 5 percent in the income distribution spends over two and a half times as much per capita on foodgrains as the lowest 20 percent of the population. Despite its large absolute expenditure, however, the upper income class allocates only 15 percent of its total expenditure to foodgrains, while the lower-income class allocates 54 percent.NCAER: All-India Consumer Expenditure Survey, (1967).

There will be employment effects at each step. Barani farmers hire few long-**term** laborers and only add extra hands at peak periods, such as harvest and threshing. Employment effects, therefore, will depend on income class. The smaller the farm the less likely it is that it will take on extra labor. Mliddle-size and larger farms will probably add short-term workers, who tend to come from nonviable farm units and from the ranks of the totally landless and underemployed artisans.48

Conclusions

Broadly accepted project-induced technological change, which increases yields of wheat, the basic staple in barani diets, can have far-reaching effects on real incomes, crop programs, and factor prices in the barani. Rural people -- those with lower incomes in particular -- spend a large proportion of their incomes on food and depend, directly or indirectly, on agriculture for a large proportion of their employment and income. Changes in the supply of food will have a direct effect on this group, especially on their real incomes and employment. Changes in the supply of food can have local effects on marketable surplus, risk-uncertainty relationships,and a shift of resources among enterprises of varying labor intensities, which are directly related to low-income producers and consumers.

Technical packages can be designed to affect the rate of adoption of new techniques and to help determine who will adopt them. Thus, they can have a profound effect on the real incomes of particular income classes, directly through increased production and indirectly through their employment effects. The Master Plan and regional planners can give direction to agricultural technicians in this regard. Subregional planners, who are unable on their own to direct policy, can thus indirectly affect policy through the medium of the technical production package.

Farm Management Analysis49

In the preceding section the distributional effects of a technical change in the production of wheat were demonstrated. In this section, the farm-level effects,income and other, that following from intervention at the farm level, will be calculated. Farm budgets for 11 farms in four zones -- Siwalik, Potwar, Thal, and D.G. Khan -- are modeed for this exercise. They operate operating under a wide variety of circumstances -- owner, tenant, and owner tenant with and without tubewells; with bullock or tractor; and varying sizes from 5 to 75 acres).50 Each farm is assigned an annual cropping schedule that a good farmer might follow to meet self-sufficiency objectives. In addition, each farm produces a number of marketable crops. Each plan is subject to the constraints of total farm size and the pattern of seasonal rotations and fallow usual to the area. Some of the larger farms are purely commercial operations. A particular cropping intensity is assumed in each instance.

48PERI,Farm Accounts, Family Budgets of Rural Families, and Cost of Production of Major Crops in the Punjab (1987).

49The farm budgets were prepared by NESPAK, Lahore, by the Master_ _Plan team.

50The budgets upon which this exercise is based appear in Appendix A.

The budgets were first built up by crop on a cost-per-acre basis, then modified to reflect the actual area dedicated to a crop. The net revenues produced represent deductions from gross incomes of variable costs and are in effect gross margins in that distributions are not made to management and ownership.

For the exercise it was assumed that farmers used fertilizer and followed the recommendations as to its use and that they bought improved seed. It was further assumed that all production costs, including labor and traction, whether by hired tractors using hired or owned equipment, were paid by the farmer. Prices for inputs and products reflect those prevailing in 1987. Thus it was possible to prepare a monthly labor budget. Yields were selected to reflect realistic returns for farmers of the type studied. From all these, gross and net revenues per acre were calculated first, and then a net revenue for the actual crop, the planted area of which can vary from a small fraction of an acre to several acres.

The particular models do not attempt to be representative; rather they include types of farm that are likely to be affected by the wheat project. The analysis will proceed from an existing crop plan, which includes a given cropping intensity, yields,and prices. Animals do not appear directly; their presence is instead made known through the surrogate of the seasonal fodder crops. Small ruminants, for example,make almost no demands on fodder or other crops, and crop programs are not configured to their particular benefit. Large ruminants, however, depend on fodder crops, and these are reflected in all of the crop programs. The large animals include draft bullocks -- in particular instances -- and milch animals, both cows and buffalo (Table I-23).51

Sensitivity tests are used to examine the effects of selected interventions on the crop program and farm income. Two types of intervention will be considered.The first, direct intervention, includes the effect of a wheat package and an oil-seed promotion program. The second, indirect intervention, includes possible indirect effects on the farm crop program of an increase in the demand for milk.

Increased Wheat Yields

Wheat is grown in large measure because it is a staple required for food, not because it is an outstanding economic performer in Pakistan. An important improvement in technology for growing wheat, other things being equal, would radically transform the economic performance of the crop.

Yields can be increased through the use of improved varieties supported by changes in cultivation practices, including periodic deep plowing, while continuing to use fertilizer at roughly the corresponding rate per acre. A yield enhancement has the effect of cutting cost per kilogram of production by increasing output per unit of input. A technical package that increased yields substantially, even in the absence of an increase in fina1 price, would be interesting and useful to farmers.

51Large ruminants are not reared for meat. Bull calves, dry milch animals,and retired animals are sent to slaughter.

TABLE 23

TYPES OF FARM USED IN THE PREPARATION OF REPRESENTATIVE BARANI FARM BUDGETS

District	Farm Size (acres)	Type of Operation	Factors of Production Used
Siwalik	5.0	Small Commercial	Tractor and Tubewell
	15.0	Tractor Owner	
Potwar	6.5	Subsistence	Tractor Hirer
	25.0	Commercial	Tractor but No Tubewell
	75.0	Commercial	Tractor and a Minidam
Salt Range	10.0	Subsistence	Bullock, No Tubewell
	15.0	Subsistence	Tractor Hire, No Tubewell
Thal	25.0	Subsistence	Bullock, No Tubewell
	50.0	Commercial	Tractor and Tubewell
D.G.Khan	12.5	Tractor Hirer	Tubewell
	50.0	Tractor Owner	Long-term Tubewell Contract

Wheat is grown during the winter, or rabi, season, when it dominates the crop program in the barani. Three quarters of the acres sown at this time are in wheat there is no close competitor. The second most important crop, rabi fodder, accounts for less than 10 percent of the total area. Five other crops are commonly grown:barley, gram, oil seed (rape and mustard; additional plantings are intercropped in wheat as a fodder), vegetables, and pulses. In the Salt Range and Thal, a variation is to be found from this program, and gram is the dominant rabi crop. In most places fodder crops must be grown to feed the farmers' livestock. In some instances, such as in D.G. Khan and Siwalik, however, the value of the fodder is so low that a farmer would be well advised to shift land to wheat, if that crop became significantly more profitable, and to buy the needed fodder and feed supplements.

The assumption is made in the analysis that a wheat production technology that can double yields is introduced into the barani.52 It is further assumed that farmers consistently use the recommended dose of fertilizer. The effect works out in two phases and is spelled out in Table I-24. In the first phase, farmers change the wheat variety on the same land allotment. The effect on income seems substantial in every instance -- a threefold or fourfold increase from initial income levels. In the second phase, at the beginning of the following growing season, assuming that no changes have occurred in relative prices, farmers shift into wheat production land formerly devoted to what have become much lower-earning crops. Some constraints

52For more information on types and quantities of crop grown in the barani areas,see Volume Four.

are experienced. Fodder must be provided to animals. A farmer may wish to be self-sufficient in some basic foodstuffs such as lentils and pulses. For the present purpose, the assumption is that all land that has been planted in crops earning less than wheat will be shifted to wheat, except fodder, in particular instances, when the opportunity cost is too great.

In the Potwar, there is little acreage to shift, so the second phase effect is virtually nil. Where an important alternative crop exists, such as gram in the Thal and Salt Range, the substitution effect is strong, and important incremental earnings are sustained.5s Intermediate effects are found in Siwalik and D.G. Khan. The initial cropping intensity is maintained throughout. Presumably, where economic incentives are strong and persistent, steps can be taken by farmers to increase the cropping intensity.

The effect of the change in productivity of wheat, in this model, is nearly uniform across crop programs in all four zones. Barley, gram, and lentils would be phased out unless a family had a compelling reason to maintain self-sufficiency in these crops. Rape and mustard are eliminated in Siwalik and D.G. Khan. Winter fodder,which earns very little per acre -- Rs 75 in one instance -- should rationally give way to a crop that can typically can earn more than Rs 2,000 an acre, and fodder and feed supplements would then be purchased.

The effect on employment is more complex.54 A number of crops require much more labor per acre than wheat. Wheat, because of the substantial labor needed for harvesting and threshing it, and given its high acreage, is highly labor demanding.A doubling of wheat output would therefore have an important effect on the demand for seasonal farm labor, from both the yield and land-substitution effects.55 In Siwalik, at the daily wage rate of Rs 45, the joint effects would add a net increment of 30 workdays per acre.

In Thal, where gram is the dominant crop, and three and a half times the acreage is devoted to it as is planted in wheat, the effect on the demand for labor is particularly dramatic. Annual labor demand per acre more than doubles, from 13to 25 workdays, with the increase in yield. When the whole of the gram acreage is shifted over, so that nearly 60 percent of the cropped acreage is planted in wheat,the incremental employment effect will be 175 workdays! Shifts of similar magnitude would occur in the Salt Range.

53Gram is the preferred crop in the Thal and the Salt Range, because it is less vulnerable to moisture stress. Some wheat is grown, however. Greater yield would therefore work to offset the extra risk associated with growing wheat, other things being equal, and the technical change would lead to substitution in its favor.

54The calculations of net revenue include the changes in demand for labor as a consequence of increased area planted in wheat.

55The extra cost of labor would reduce net revenues somewhat, but not enough to change the thrust of the argument.

TABLE I-24

THE EFFECT ON NET REVENUES OF
DOUBLING WHEAT YIELDS ON
· **FARMS** IN **FOUR ZONES** OF **THE** BARANI

District and Size of Farm (Acres)	First Phase: Increase in Revenues from Increasing Yield (Percent)	Second Phase: Increase in Revenues from Increasing Area (Percent)	Both Phases: Increase in Net Revenue (Rs)	Both Phases: Cropping Intensity (Percent)
Siwalik				
6.0	266	128	8,066	139
15.0	264	128	20,186	139
Potwar				
6.5b	450	162	8,929	66
25.0	314	nil	16,101	75
75.0	278	nil	40,858	86
Salt Range				
10.0	382	363	10,408	72
15.0	459	347	11,361	75
Thal				
25.0	394	439	14,157	78
50.0	463	381	29,450	86
D.G. Khan				
12.5	282	122	11,869	97
50.0	279	122	47,567	100

Source: Calculated from NESPAK farm management programs for Master Plan.

Note:

The effects of a doubling in wheat yields are intended to be illustrative and not necessarily faithful to reality. Judgments intrude into the decision which crops a farmer is likely to save or replace and into many particular determinations having to do with fertilizer and other use of inputs.

a

Fertilizer and other material applications, some prices, and a crop program different from the other farm models in the Potwar were used for this farm size. Results are therefore not fully comparable. The model is intended to reflect the possibilities potential to a small farm.

TABLE I-25
LABOR COSTS FOR **RABI** CROPS IN SIWALIK

Crop	Cost of Labor per Acre (Rs)	Cost per Area Grown (Rs)
		1,732
Wheat	630	
Barley	315	6
Gram	280	42
Rape and Mustard	160	8
Fodder	750	300
Lentil	125	25

Note: Costs per unit are for all scales of operation.

Source: Calculated from NESPAK farm budgets.

The effect of a doubling of wheat yields on seasonal employment multiplied across thousands of acres in four zones of the barani, would represent an important local augmentation of income and would be shared in part among landless laborers,the most vulnerable element in rural society.

Oil Seeds

The supply of vegetable oil remains a matter of concern in Pakistan.The country imports the commodity, even though it is abundantly endowed with the physical environment needed to produce oil seeds. What is lacking is sufficiently high prices to attract farmers to their production. What would be the effect on barani farmers if, for whatever reason, market prices for oil seeds rose 50 percent?

Two oil-seed producing plants are grown on barani farms: groundnuts and sunflowers. Sunflowers are grown exclusively for their seeds, while groundnuts are produced to be consumed as a food as well. The analysis is focused on sunflowers,and their prevailing price is assumed to be Rs 4.20 per kilogram. It is assumed that the farmer will attempt to maximize income within the constraint of self-sufficiency,which is to say that he may grow a minor crop rather than buy it, even when losing some current revenue. Such crops include summer fodder and a coarse grain.

The effect of an increase of 50 percent in producer prices of sunflowers, from Rs 4.2 to Rs 6.3, would be to increase the net revenue received from the crop. This revenue is initially small, because very little land is allocated to sunflowers. A 6.5-acre farm in the Potwar may have no more than a tiny fraction of an acre -- 0.0005-- devoted to sunflowers, and the largest farm, 75 acres, only 0.0015 acres. In the absence of a price rise, sunflowers on the 6.5-acre farm, earn the second lowest net return per acre, exceeded only by the summer fodder crop. Farmers on the 25-acre and 75-acre farms see the crop as more important. On these larger farms, four crops are less profitable: fodder and all three coarse grains. All are consumed on the farm.

An increase of 50 percent would have an important effect on the areas cropped **and** on net returns to farmers from them, and these effects vary, depending on the **scale** of the operation. Each of the smallest farms would plant almost a tenth of an **acre** in sunflowers, add one laborer, and earn an incremental net income of Rs 2,250,up from just Rs 8 before the rise in price. The additional land is found by giving **up** land planted in coarse grains and pulses. This represents the maximum shift in cropping **pattern** that could take place without creating a net reduction in income (Table I-26).

TABLE I-26

INCOME EFFECTS OF AN INCREASE IN OIL SEED PRICES
FROM RS 4.2 TO RS 6.3 PER KILOGRAM IN THE POTWAR

Farm Size (Acres)	Increase in Farmland Planted in Oil Seed (Acres)	Resultant Increase in Income (Rs)	Resultant Increase in Workdays Required
6.5	0.08	2,190	
25.0	2.50	11,562	7
75.0	7.50	23,135	46

Source: Calculated from NESPAK Farm Management Study.

The situation of the larger farms is different. In response to a rise in price,they shift away from production of the two most important coarse grains, millet and maize, into production of sunflower, gaining two acres to plant in the oil seed.Their net increase in income per acre cropped is small -- about Rs 60 for the 25-acre farm and Rs 140 for the 75-acre farm.

The employment effect is important. The increment of approximately one-tenth of an acre for the smallest farm requires the addition of an extra person-day of labor. The 25-acre farm, however, will need 7 extra workdays, while the largest will require 46 additional workdays. On the large farms, it is likely that the extra hands will be hired from among thelandless labor force.

This analysis underscores two points. First, it will take a considerable rise in price to have much of an effect on absolute supply, even when many farms may be shifting land to growing of oil seed. This reflects the comparatively low returns on oil seeds, even when prices are increased. Second, to the extent that farms wish to remain self-sufficient in coarse grains, the anticipated increase in supply will not be as large. Conversely, large increases in oil-seed prices are likely to have an adverse effect on coarse grains and then on pulses. On the positive side, an oil seed production program could have rather high employment effects, which might make it a desirable option in barani areas.

Increased Animal Herds

Milk and other dairy products are basic staples in barani diets and as such are "necessities," an argument borne out in their income elasticities, which are higher than those of wheat but lower than those of foods such as meat, vegetables, and fruit. An increase in income will increase the demand for dairy products,the magnitude of the increase depending on the income class of the consumer. The question that remains is whether this increase in demand will be reflected in crop patterns and the size of farmers' animal holdings.

Extra production can come from increasing the numbers of animals held or from a change in the quality and quantity of feed provided the animals. The issue in the barani is whether the farm's production system can sustain extra animals, given the price of milk and the prices of crops alternative to fodder.

Farmers with buffalo now feed them crop by-products, while buying some supplements. The basic herd of 2.4 buffalo is maintained by using all the dry matter of the farm. The quality of feed varies seasonally, and with it the feed intake and level of milk production. The feed regime would produce 1.5 liters daily, and the basic herd would produce 936 liters of milk annually without supplemental feeding.At a producer price of Rs 3 per liter the annual value to the farm would be Rs 2,808,which, when added to crop revenues of Rs 3,130 yield a net farm revenue of Rs 5,958.56

It was shown earlier that a small Potwar farm of 6.5 acres could support 3.5buffalo, an increment of 1.1 above the more conventional 2.4-buffalo farm. A possible improvement in the program would produce two periods of high-quality feed production -- oats and sorghum -- and two periods with no fodder production but consumption of hay conserved from previous seasons. Because hay is of higher quality than bhusa, average daily milk production per head would be more than twice that otherwise possible, and total milk production would be more than three times as great. This production level is based on the assumption that all fodder energy is converted into milk and none into work.

This strategy is not profitable, however. The income lost by shifting to a full fodder-crop program could not be offset by extra milk production at the present low price of milk. Gross revenue from milk production is Rs 10,073. Net revenue is only Rs 4,567, whereas that of the unspecialized farm is Rs 5,938. The 1988 producer price of milk must rise from Rs 3.0 per liter to Rs 3.74 per liter before fodder and milk production can match the present cropping pattern.

An alternative approach is for the farm to keep the basic average of 2.4animals, use crop residues, and increase the quality of feed by buying supplements such as cottonseed with a view toward increasing the yield of milk from a richer diet. The consumption of two kilos of cake daily during the winter season, when farm-produced dry matter is scarce, would provide milch animals enough energy to add 0.75 liters of production per head per day during that season. Average milk production would rise to 2.76 liters a day, for a total farm production of 1,722 liters.The value of this production, after deduction of concentrates, is Rs 4,206, and total farm revenue is Rs 7,336.

This analysis suggests that small farms should not consider specializing, but should improve husbandry practices, with particular emphasis on feeding. Larger

56Details of this calculation will be provided in Volume Four.

farms, and ones that are especially well sited, may consider specialization where economies of scale are possible. Stall feeding is appealing if a farm has limited land and limited access to feed and markets.

What would be the effect on labor from an intensification of dairy production?No labor budgets for animal husbandry are available. One study of the subject in Pakistan reports the annual labor needs per animal to be about 55 workdays and nearly 76 workdays per lactating animal.57 Dairy herds, composed of buffalo and cows, require labor to manage them directly and to grow and collect fodder from the farm. The labor input to milk is therefore high, including both fodder and cereal by-products as intermediate goods, and the effort required to manage the animals themselves. It is likely that an increase in demand for milk would have a strong positive derived demand effect upon labor, putting particular pressure on those members of the family usually in charge of animal husbandry.

Implications of **Technological Change** for Research and Project Design

Regional planners must try to determine means by which agricultural productivity can be increased. Two stand out crop research and agriculture-related research, which produce technical packages proved and demonstrated at the farm level and consistent with the needs and concerns of farmers, and improvements in the quality of farm management. Taken separately or jointly, these can dramatically reduce production costs and may serve as alternatives to higher prices in inducing innovation.

Improvements in farm productivity, whether the result of technological changes in inputs of more efficient farm management, do not have the deleterious effects that prices have on lower-income consumers. If divisible, these improvements can reach a broad spectrum of producers. Increases in productivity are, moreover,permanent and have a less-skewed distribution of benefits to producers. Increased farm productivity, by increasing returns per acre, reduces the number of acres needed to achieve basic viability and thus promotes an important policy objective of reducing, in some measure, the flight from rural areas.

The regional plan should provide direction to technical staff. Direction should include criteria that technical packages must satisfy -- divisibility above all -- then go on to identify supplementary actions to provide needed supporting structures.The reliable provision of inputs and establishment of efficient market structures are cases in point. Direction should include the identification of the target beneficiary group. Regional planners have an advantage in this regard over leaving decisions to the market in that they can target objectives. Planners can therefore identify and plan for particular changes, and these can be built into the technical package through Plan criteria.

The technical package, in its essential components, can have great influence on the composition of demand for factors of production, the identity of the beneficiary group, and the kind of support projects must provide. A simple-minded effort to obtain maximum production will not do. The design of the technical intervention is too important to be left to agricultural technicians alone. The final package must be the joint product of farming systems analysis by means of which the design criteria that technical research will follow should be developed.

57Jamil Khan and H. Rahman, eds., Economics of Village Livestock,Publication No.198(Lahore: PERI, 1982).

In analysis of farming systems a holistic view is taken, and the farm,the range, and economic and other constraints are looked at as a whole dynamic system.An attempt is then made to understand the interactions among the different parts of the system and to assess the effects of interventions more realistically. Thus,farming systems research should put planners in a position to judge the trade-offs farmers must make at each point in the year. Development of a single longer-duration crop, for example, might prove to reduce total farm income by displacing a potential second crop, or there may be off-farm opportunities for income that are too good to be missed regardless of the crop, in which case package design might call for the introduction of labor-saving practices. These complex effects of a potentialintervention can easily be missed in the absence of a methodology of farming systems.

A technical package cannot stand alone; its use and caveats must be understood by the farmer. Farmers must be trained in proper use of it by persons who understand both the farmer and the technical solutions. Too often farmers are introduced to packages through incantations, by agents who themselves lack the knowledge to use them well. Farmers who have developed ad hoc management systems of their own will have an easier time adopting technical packages. Field experience of the Master Plan team indicates that these systems are often conservative in application, because they depend on accumulated precedent for decision making because of the risk-averse behavior of farmers. In the context of changing technologies, crops, market opportunities, and complex household earning strategies, traditional management guidelines break down.Although the farmer's objective, the provision of family survival needs, remains the same, the means of accomplishing it have changed and continue to change. A new technical package is one more unknown intervention, from the farmer's point of view, and it is likely to be resisted.

Programs that seek to promote rural development will have to include some element of farmer education. Means must be found to sensitize farmers to opportunities, choices, and risks. They must be introduced to the mechanisms that are in place to serve them. Most important, they must become better farm managers, able to judge among alternatives on rational grounds. The trained farmer will be in a better position to introduce a package into his farm program.

Where crop production is supported through a contract, focused extension is provided by agents who are skilled in farm management. If the productivity of farmers in the barani is to be increased, some equivalent mechanism must be found to provide them with this badly needed support. The personnel of public extension services are rarely trained to provide management support to farmers. Their skills are more passive and are often limited to demonstration plots and production formulas. Farmers, each of whom operates in a unique situation, need individualized help in the interpretation of technical packages for their own circumstances if they are to make the best use of them at an acceptable level of risk.

Productivity-oriented crop-production programs suitable for introduction into existing farming systems should be the result of thorough analysis of those systems,and the resultant packages should be configured accordingly. A focus on the needs and competing objectives should define and direct important components of the research design and, later, the introduction and support of the package. Such an approach will be much more demanding of implementation than the conventional,less-focused, seed-fertilizer-practice packages and may require some possibly extensive organization of the packages. A useful object lesson could be learned from some of the successful contract-farming schemes, which provide farmers a proven technical package focused on an improved high-value crop, dedicated extension and farm-management support in its implementation, timely provision of inputs, and an assured final market and floor price.58

SUMMARY AND CONCLUSIONS

Three phenomena have dominated the barani's economy for the past fifteen years:

· The seed and fertilizer revolution;

· Generally favorable sectoral terms of trade; and

Extensive off-farm employment opportunities, mainly for young adult men,both inside and outside the area.

Together these have changed the structure of the barani economy in fundamental ways.

This survey began with a review of beliefs commonly held regarding the barani."Progress" is a subjective judgment. If widespread autonomous, although selective,acceptance of a new technology in the course of a decade is evidence of progress,then it is arguable that the barani has not been a stagnant backwater. Less evident are the distribution effects on a population that shares the land base unequally.Complex survival strategies have been developed by barani people, reflecting access to alternative opportunities, on the one hand, and a variable but persistent push outside rural areas, on the other. The following points developed in the course of the analysis argue that the barani, although not as prosperous as other parts of Pakistan, seems to have adapted to changing opportunities effectively.

58The Master Plan is not recommending that a contract production scheme be attempted in the case of every crop. Rather, attention is drawn to some of the methods used to introduce and support new production methods. Well-trained, highly motivated -- and paid -- extension agents are the key to successful contract schemes. These schemes do not work well in setting guaranteed prices for production where a crop is homogeneous and cannot be distinguished from the same crop produced outside the scheme. Credit systems are almost impossible to operate in such circumstances.

First: Is the Barani in Economic Decline?

Although less well off in its basic agriculture than the Punjab as a whole,the barani does not appear to be falling progressively farther behind. Farm incomes,while rising as new technology is accepted, are nonetheless insufficient to equalize the income of the area with those in irrigated parts of the country. The gap is narrowing, however, to an important extent when farm families are able to earn supplementary off-farm incomes. Farm incomes vary greatly among barani zones.The present analysis concludes that the inhabitants of the barani succeed in extracting a basic standard of living from a difficult patrimony.

The empirical evidence suggests that there has been a net inflow of income into the barani since the mid 1970s. The sectoral terms of trade have favored agriculture, but all the primary commodities have done relatively well. Add to this remittances, off-farm incomes, and generally favorable public policy, and a strong case can be made to the effect that barani farmers at least have shared -- if not always equally with those in irrigated areas -- in the economic opportunities made available by the seed-fertilizer revolution in wheat. Incomes in the barani have certainly not decreased.

Second: Have Traditionally Subsistence Farms been Relegated to a Marginal Role **and Starved of Production Investments?**

An argument can be made that subsistence agriculture, which includes the majority of farms, is in decline. This reflects a shift in importance of the family farm as the principal source of family income. Evidence indicates that the contribution of the farms to household income has fallen from more than three quarters to about half in several parts of the barani. The farm family itself may be better off in real income than ever before. The growth of off-farm opportunities to earn income has brought important options to farm men. Indeed, the farm itself may have become a fallback position in an overall farm-income strategy, a place of retreat from economic adversity, and the place where the dependent family can be kept,including the elderly, the very young, and women.

Earnings from emigration are beginning to provide the investments necessary to make agriculture more productive. Evidence for this trend includes the progressive restructuring of farm household incomes along lines of complex portfolio management both on-farm and off-farm employment taken by men, emigration to more remote places where work opportunities exist, some diversification of livestock holdings to reflect new commercial opportunities, and the production of high-value crops for sale in addition to the staple wheat. Added to this are land rental and special businesses that include tractor rental and transport. Farm families use externally generated income, not only to supplement home consumption, but also to reduce overall farm debt, to acquire land, and to support the selective acceptance of new technologies.Livestock, meanwhile, is being promoted as an important enterprise sector.

TABLE I-27

TRENDS IN KEY TECHNOLOGY FACTORS IN THE JATLI AREA OF THIE POTWAR,1982-1986
(percent)

Year	Yield (tons per hectare)	Use of Pak 81	Use of Drills	Use of Threshers	Use of Tractors	Use of Animals
1982-83	1.90	2	20	54	35	51
1983-84	1.77	2	26	83	46	37
1984-85	1.83	18	46	83	58	17
1985-86	2.44	55	59	99	71	14

Note: In 1975-76, 86.9 percent of the farms in this area of Gujar Khan used 40kilograms of fertilizer per acre.

Source: Hobbs,Saeed,and Farooq, Dynamics of Technological Change in Rainfed Agriculture: Wheat in the Northern Punjab, (Islamabad: CIMMYT,n.d.).

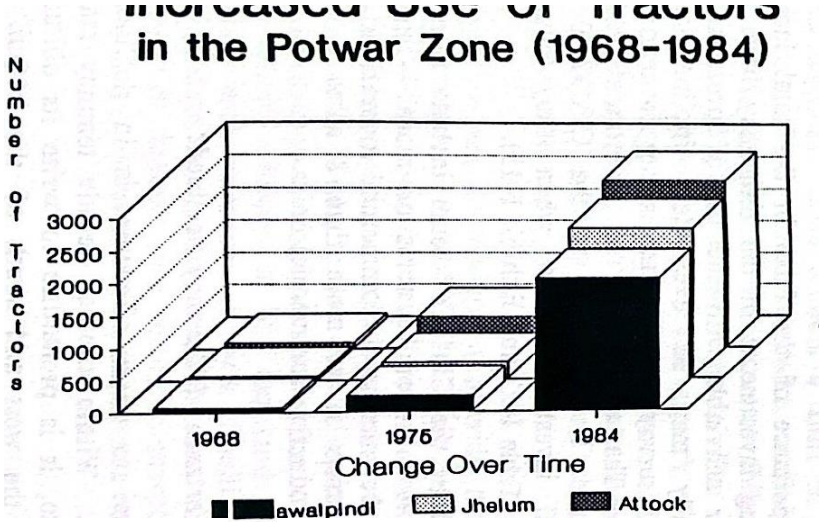
As the relative importance of the farm in the total income picture has declined,the importance of making investments in the unit may have declined as well. If the farm is barely viable or nonviable with the use of present technology and at present farm prices, the family may be even less inclined to put money into it.Nevertheless, the PERI survey shows that some farmers place a high value on upgrading their farms. The exact form of investment varies greatly as it reflects particular local situations. The findings of the CIMMYT team are suggestive and show that farmers will invest in farms when they consider it an economically interesting move to make (Table I-27 and Exhibit I-15).

The farms reported by the CIMMYT team include farms of all scales. But it is clear that larger farms -- those of 25 acres or more -- using new crop technologies and tractor tillage, can be successful commercial operations. With a full application of known technologies, farms of no more than 8 acres -- and even smaller farms--could become profitable productive commercial units.

Third: Has the Importance of Tenancy Declined?

The census findings are clear. Tenancy is in decline all over the barani, but especially in Rawalpindi. Within another decade tenancy may become an anachronism in some places. Even so, it is premature to write its obituary. Although in decline,the practice persists in the west and south of the barani. The removal of tenants by owners does signal the pushing of many families out of agriculture who might otherwise want to stay, and it probably contributes to the rural exodus. Similarly,

Increased Use of Tractors

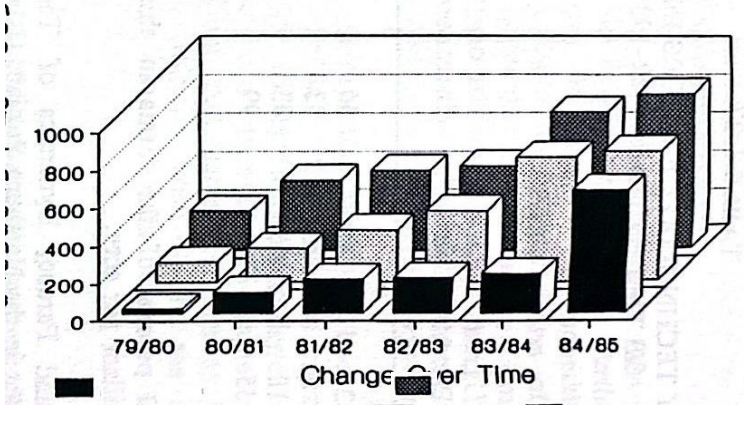


Source:Agrlcultural Cenaua Organlzation

Increased Use of Threshers

in the **Potwar Zone (1979-1985)**

Numb



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Rawalpindl Jhelum Attock

the practice of hiring in land -- owner-cum-tenancy -- is dying out. The shift in the structure of land management has important implications for equity and long-term growth, for investment in agriculture, for the composition and supply of the rural labor force, and, ultimately, for development planning. Tenant farmers can keep less produce -- farm revenue -- than farmer-owners; a decline in tenancy,therefore, would definitely benefit barani farmers who stay on the farm. Farm owners, furthermore, are more likely to invest in their farms and thus promote agricultural growth.

Fourth: Are the Young Leaving? and What are the Implications?

A strong empirical case can be made that young, better-trained men, from both farm and nonfarm rural families, leave the barani to seek employment. The opportunities for incomes superior to any now possible on the farm lures them,especially when they have some technical skill to sell.

The economy of the barani is now structured to tap exotic income opportunities managed through an opportunistic survival strategy that stresses exploitation of non-barani income opportunities to the benefit of the barani. Emigration must be seen as part of a sophisticated and successful survival strategy. Technical skills, a scarce resource, have been allocated so as to maximize reliable income streams, providing money that could not be earned on farms. Without emigration, the barani could not function effectively. A strong case can be argued that the "best and brightest" may be leaving the barani -- young men between the ages of 20 and 40 -- many of whom carry with them such technical skills as are available in the area: skills in masonry,carpentry, mechanics,and so on. If emigrants keep close links to their homesteads,however, providing a flow of investment capital and, as the occasion demands, their own labor, migration could be counted an asset.

Although a large percentage of the emigrating workers may be gone from their farms at any given time, the extent to which they are economically lost is not clear.Many continue to maintain close links to their homes and may return to provide seasonal work on the farm or to send money. Less clear, as will be seen, is the degree to which their managerial input is lost.

A strong case can be made as well that the loss of able-bodied adult men has affected the available supply of farm energy. Men do return to participate at peak seasons -- harvest in particular -- but timeliness of operation may be adversely affected. Whereas no farm studied in the PERI Master Plan Survey hired.permanent labor, many took on short-term seasonal labor, which suggests that there are localized constraints to the supply of energy.

Fifth: How Widely has the Wheat Seed and Fertilizer Revolution Spread in the Barani?

Scattered information from many observers supports the view that the seed and fertilizer technology has spread widely in the barani. This spread has not been conditioned by lack of means or even knowledge as much as suitability of the new technology in particular circumstances. The improved varieties of wheat, with all their faults, appear to have been accepted where they make technical and economic

sense.Even where new interests have not appeared, farmers have increased their use of fertilizer on traditional varieties of wheat. In the absence of suitable varieties and with the lack of seed for such improved lines as are available, the present level of fertilizer use is reported to be substantial. As early as 1980 many farmers were using both inputs. Divisibility allows even poor barani farmers to participate in the new technology to the extent that their individual means permit.Fertilizer is a scale-neutral input, a characteristic that permits quantities to be as divisible as the particular needs of the buyers dictate. This is also true of seeds.

Sixth: Is the Quality of Farm Management Adversely Affected by the Off-Farm **Migration?**

There is no direct empirical information on this point. Experience elsewhere suggests that one effect of the out-migration of younger men or mature men is a decline in the quality of farm management. This is because these men are the natural on-farm leaders, willing to assume somewhat more risk in experimentation,who make the on-farm decisions regarding crop program, allocation of inputs, income strategy, and so on. The residual population is composed of older, more conservative,and presumably less well educated people, and the very young. It is unlikely that women, who also remain on the farm, can or do make investment or farm management decisions alone in the absence of men. To the extent that women are able to substitute for this gap, the problem is minimized, but it has implications for extension strategy. If, however, they are found to be unable to assume critical management responsibilities, the departure of the principal males may represent a serious loss, and the agents of change will face a difficult challenge.

Seventh: Where does the Advantage of Barani **Agriculture** Lie?59

Barani agriculture is profitable and competitive when sufficient moisture is available and good varieties are cultivated with the use of productive techniques on viable land. These conditions are not often satisfied naturally. The key to improvemnent of barani crop production is efficient management of moisture. This can be achieved through better management of surface water,using small dams,appropriate plowing to retain water -- and incidentally to control erosion -- sound water-harvesting practices, and widespread timely use of tractors with suitable implements. With increased supplies of moisture, barani agriculture is well placed to realize a large, untapped potential increase in yields. Wheat is perhaps the more important crop in this regard. Indeed, CIMMYT specialists argue that the barani's rainfall regime is more beneficial to wheat production than is canal irrigation, giving the barani a natural comparative advantage over the rest of the Punjab in wheat production. The use of high-yielding varieties (HYV) of wheat appears to be directly related to levels of moisture. Furthermore, HYV technologies appear to be scale-neutral.

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59 Many of the ideas for this section are derived from P. Hobbs, I. Saeed and U. Farooq, Dynamics of Technological Change in Rainfed Agriculture: Wheat in the Northern Punjab (Islamabad: CIMMYT, n.d.).

If the means can be found to accelerate the transfer of technology,including **better** farm-management practices, to barani farmers, and if effective systems can be **introduced** by which needed energy can be supplied to farmers through custom **traction,** and if all this can be supported in the long term by practical farm systems **research,** there will be good reason to foresee a prosperous Punjab barani, whose **wealth** is fairly distributed, based on a productive agriculture. Helping bring all this **about** is **the** challenge facing barani Master Planners.

ANNEX

TABLES SUPPORTING FARM BUDGET ANALYSIS

TABLE A-1

POTWAR ZONE
NET REVENUE AND FARM INCOME
FOR A 6.5 ACRE FARM
BEFORE PROJECT

Crop	Production Costs (Rs/ acre)	- Yield (kgs. per acre)	Unit Value (Rs/ kg.)	By-Prod. Value (RS/ acre)	Gross Rev. (Rs/ acre)	Net Rev. (Rs/ acre)	Crop Area (%)	Total Crop Net Income (Rs)
Millet	324	185	3.10	125	699	375	5.10	124
Maize	727	404	2.50	175	1185	458	0.17	5
Sorghum	406	198	2.80	125	679	273	0	0
Orchards	1106	5500	2.08	0	11440	10334	0.05	34
Kh. Fodder	470	5000	0.18	0	900	430	7.6	212
Kh. Vegetable	1846	7200	1.90	0	13680	11834	0.15	115
Groundnut	920	434	6.40	50	2828	1908	7.8	967
Kharif Pulses	384	303	7.60	125	2428	2044	0.88	117
Sunflower	661	200	4.00	0	800	139	0	0
Wheat	1208	368	1.90	250	949	-259	48	-807
Barley	523	268	1.84	150	643	120	0	0
Gram	550	199	5.40	150	1225	675	2.5	110
Rape & Mustard	407	231	4.80	175	1284	877	1.4	80
Rabi Fodder	1170	4000	0.20	0	800	-370	5.3	-127
Rabi Vegetable	1371	11500	0.90	0	10350	8979	0.15	88
Lentil	392	230	6.50	75	1570	1179	0	0

Cropping Intensity	79	Gross income -Rs	918
Rabi	57		
Kharif	22		

TABLE A-2

POTWAR ZONE
LABOR USE, **BY MONTH**
(person-days)

	MONTH												
	1	2	3	4	5	6	7		8	9	10	11	12Total
Millet	0	0	0	0	0	1	1	0.5	0.5	3	0	0	6
Maize	0	0	0	0	0	0	1	2	0.5	0.5	5	0	9
Sorghum	0	0	0	0	0	0	1	1	0.5	0.5	3	0	6
Orchards	6	4.5	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	6	27
Kh. Fodder	0	0	0	0.5	1	0.5	2	4	0	0	0	0	8
Kh.Vegetable	0	0.5	4	2.5	4	6	6	0	0	0	0	0	23
Groundnut	0	0	0	0.5	2	1	0	0.5	0	3	1	0	8
Kharif Pulses	0	0	0	0	0	0	0	0.5	2.5	4	0	0	7
Sunflower	0	0	0	0	0	2	0.5	0.5	5	1	0	0	9
Wheat	0.5	0.5	0.5	6	0	0	0	0	0	2	3	0.5	13
Barley	0.5	0	3	0	0	0	0	0	0	1	2	0.5	7
Gram		0	3	1	0	0	0	0	1.5	0	0	0.5	7
Rape & Mustard	1	3	1	0	0	0	0	0	2	0.5	0.5	0	8
Rabi Fodder	5	5	5	4	0	0	0	0	2.5	0.5	3	5	30
Rabi Vegetable	2	1	0	0	0	0	0	1	4	2	2	2	14
Lentil	0	0	2.5	0	0	0	0	0	1	0.5	0.5	0.5	5
Total	16	14.5	21	15	7.5	11	12	10.5	20.5	19	25	15	187

TABLE A-3

POTWJAR ZONE
NET REVENUE AND FARM INCOME
WITH PROJECT

Crop	Production Costs (Rs/ acre)	Yield (kgs. per acre)	Unit Value (Rs/ kg.)	By-Prod.Value (Rs/ acre)	Gross Rev. (Rs/ acre)	Net Rev. (Rs/ acre)	Crop Area (%)	Total Crop Net Income (Rs)
Millet	590	250	3.10	200	975	385	0.00	0
Maize	1056	1000	2.50	250	2750	1694	0.20	22
Sorghum	720	500	2.80	250	1650	930	0.50	30
Orchards	1126	5500	2.60	0	14300	13174	0.00	0
Kh. Fodder	746	8000	0.18	0	1440	694	10.00	451
Kh. Vegetable	1916	7200	1.90	0	13680	11764	0.00	0
Groundnut	1286	850	6.40	100	5540	4254	12.50	3456
Kharif Pulses	539	450	7.60	150	3570	3031	1.00	197
Sunflower	786	350	4.00	0	1400	614	0.00	0
Wheat	1473	850	1.90	350	1965	492	35.00	1118
Barley	603	500	1.84	200	1120	517	10.00	336
Gram	743	450	5.40	200	2630	1887	5.00	613
Rape & Mustard	577	350	4.80	250	1930	1353	1.00	88
Rabi Fodder	1461	6500	0.20	0	1300	-161	10.00	-105
Rabi Vegetable	1431	11500	0.90	0	10350	8919	0.00	0
Lentil	611	350	6.50	125	2400	1789	1.00	116

Cropping Intensity		86	Gross income	Rs 6323
	Rabi	62		
			Kharif	24

TABLE A-4

POTWAR ZONE
LABOR USE, BY MONTH
WITH PROJECT
(person-days)

MONTH

	1	2	3	4	5	6	7		8	9	10	11	12	Tot
Millet	0	0	0	0	0	1	1	0.5	0.5	3	0	0		6
Maize	0	0	0	0	0	0	1	2	0.5	0.5	5	0		9
Sorghum	0	0	0	0	0	0	1	1	0.5	0.5	3	0		6
Orchards	6	4.5	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	6		27
Kh.Fodder	0	0	0	0.5	1	0.5	2	4	0	0	0	0		8
Kh. Vegetable	0	0.5	4	2.5	4	6	6	0	0	0	0	0		23
Groundnut	0	0	0	0.5	2	1	0	0.5	0	3	1	0		8
Kharif Pulses	0	0	0	0	0	0	0	0.5	2.5	4	0	0		7
Sunflower	0	0	0	0	0	2	0.5	0.5	5	1	0	0		9
Wheat	0.5	0.5	0.5	6	0	0	0	0	0	2	3	0.5		13
Barley	0.5	0	3	0	0	0	0	0	0	1	2	0.5		7
Gram	1	0	3	1	0	0	0	0	1.5	0	0	0.5		7
Rape & Mustard	1	3	1	0	0	0	0	0	2	0.5	0.5	0		8
Rabi Fodder	5	5	5	4	0	0	0	0	2.5	0.5	3	5		30
Rabi Vegetable	2	1	0	0	0	0	0	1	4	2	2	2		14
Lentil	0	0	2.5	0	0	0	0	0	1	0.5	0.5	0.5		5
Total	16	14.5	21	15	7.5	11	12	10.5	20.5	19	25	15		187

TABLE A-5

FARM BUDGET OF A TRACTOR-HIRING FARM
OF 6.5 ACRES IN THE POTWAR ZONE
APPLICATION OF MATERIALS AND OPERATIONS
PER ACRE WITH PROJECT

Crops	Tillage (No)	Seed (Kg)	Nit. Fert. (Nut. Kg)	Phos. Fert. (Nut. Kg)	Others (Rs)	Labor (Person-days)	Pesticide (Percent)
Millet	2	6	23	23	0	6	0
Maize	4	30	46	23	0	9	5
Sorghum	3	25	23	23	0	6	0
Orchardsa	2	8	9	23	0	27	15
Kh. Fodder	3	25	23	23	0	8	0
Kh. Vegetable	7	10	9	23	0	23	5
Groundnut	4	40	18	46	0	8	0
Kharif Pulses	2	8	11.5	11.5	0	7	0
Sunflower	3	10	9	23	0	9	5
Wheat	6	40	33.5	33.5	0	13	0
Barley	3	25	11.5	11.5	0	7	0
Gram	3	25	11.5	11.5	0	7	5
Rape & Mustard	3	4	23	0	0	8	0
Rabi Fodder	4	40	32	23	0	30	0
Rabi Vegetable	6	6	9	23	0	14	5
Lentil	3	10	9	23	0	5	0

a Weighted number for orchards.

TABLE A-6

POTWAR ZONE
UNIT RATES FOR MATERIALS AND OPERATIONS

Crops	Tillage (Rs/No)	Seed (Rs/ Kg)	Nit. Fert. (Rs/ Nut)	Phos. Fert. (Rs/ Nut)	Chem. (Rs/ Acres)	Labor (Per-son-days)	Pesti-cide (Rs/ Acre)
Millet	60	4.0	6.1	4.6	50	25	100
Maize	60	3.5	6.1	4.6	50	30	100
Sorghum	60	3.8	6.1	4.6	50	25	100
Orchards	60	5.0	6.1	4.6	50	25	200
Kh. Fodder	60	3.8	6.1	4.6	50	25	100
Kh. Vegetable	60	65.0	6.1	4.6	50	25	200
Groundnut	60	8.5	6.1	4.6	50	45	100
Kharif Pulses	60	12.0	6.1	4.6	50	25	100
Sunflower	60	7.5	6.1	4.6	50	35	100
Wheat	60	3.0	6.1	4.6	50	45	100
Barley	60	3.0	6.1	4.6	50	25	100
Gram	60	8.0	6.1	4.6	50	30	100
Rape & Mustard	60	8.0	6.1	4.6	50	25	100
Rabi Fodder	60	3.0	6.1	4.6	50	25	100
Rabi Vegetable	60	75.0	6.1	4.6	50	25	200
Lentil	60	9.5	6.1	4.6	50	30	100

TABLE A-7

POTWAR ZONE
EXPENDITURE PER ACRE ON VARIOUS ITEMS
OF CROP PRODUCTION
(Rs)

Crops	Til-lage	Seed	.. Fert.	Phos. Fert.	0th-ers	Labor	Pest cide	i- Misc	. Total
Millet	120	24	140	106	0	150	0	50	590
Maize	240	105	281	106	0	270	5	50	1056
Sorghum	180	94	140	106	0	150	0	50	720
Orchards	120	40	55	106	0	675	30	100	1126
Kh. Fodder	180	95	140	106	0	200	0	25	746
Kh. Vegetable	420	650	55	106	0	575	10	100	1916
Groundnut	240	340	110	212	0	360	0	25	1286
Kharif Pulses	120	96	70	53	0	175	0	25	539
Sunflower	180	75	55	106	0	315	5	50	786
Wheat	360	120	204	154	0	585	0	50	1473
Barley	180	75	70	53	0	175	U	50	603
Gram	180	200	70	53	0	210	5	25	743
Rape & Mustard	180	32	140	U	0	200	U	25	577
Rabi Fodder	240	120	195	106	0	750	U	50	1461
Rabi Vegetable	360	450	55	106	0	350	10	100	1431
Lentil	180	95	55	106	0	150	0	25	611

TABLE A-8

POTWAR ZONE
EXPENDITURE ON VARIOUS ITEMS
OF CROP PRODUCTION
(percent)

Crops	Til-lage	Seed	Nit. Fert.	Phos. Fert.	Oth-ers	Labor	Pesti-cide	Misc.	Tot
Millet	20.3	4.1	23.8	17.9	0.0	25.4	0.0	8.5	100
Maize	22.7	9.9	26.6	10.0	0.0	25.6	0.5	4.7	100
Sorghum	25.0	13.0	19.5	14.7	0.0	20.8	0.0	6.9	100
Orchards	10.7	3.6	4.9	9.4	0.0	60.0	2.7	8.9	100
Kh. Fodder	24.1	12.7	18.8	14.2	0.0	26.8	0.0	3.4	100
Kh. Vegetable	21.9	33.9	2.9	5.5	0.0	30.0	0.5	5.2	100
Groundnut	18.7	26.4	8.5	16.4	0.0	28.0	0.0	1.9	100
Kharif Pulses	22.3	17.8	13.0	9.8	0.0	32.5	0.0	4.6	100
Sunflower	22.9	9.5	7.0	13.5	0.0	40.1	0.6	6.4	100
Wheat	24.4	8.1	13.9	10.5	0.0	39.7	0.0	3.4	100
Barley	29.8	12.4	11.6	8.8	0.0	29.0	0.0	8.3	100
Gram	24.2	26.9	9.4	7.1	0.0	28.3	0.7	3.4	100
Rape & Mustard	31.2	5.5	24.3	0.0	0.0	34.6	0.0	4.3	100
Rabi Fodder	16.4	8.2	13.4	7.2	0.0	51.3	0.0	3.4	100
Rabi Vegetable	25.2	31.5	3.8	7.4	0.0	24.5	0.7	7.0	100
Lentil	29.5	15.6	9.0	17.3	0.0	24.6	0.0	4.1	100

CHAPTER TWO

THE INSTITUTIONAL FRAMEWORK FOR BARANI DEVELOPMENT

INTRODUCTION

This subsector study evolved during the writing of the Master Plan.Organizational changes continued during the 18-month period as it became obvious that the institutional arrangements for barani development could not satisfy the needs of rapid modernization.

The most significant change has been the creation, or announcement of the intention to create, Development Authorities for individual barani zones.1 Because the restructuring of the institutions dealing with barani development has been a continuing concern during the preparation of the Master Plan, the first two sections of this chapter analyze the two existing models: Zonal Development Authorities and the Agency for Barani Areas Development (ABAD). The third section offers a recommended solution, building upon the existing institutional framework. The fourth section concludes the study. The Annex provides background on the history and current practice of development planning in the Punjab.

ZONAL DEVELOPMENT AUTHORITIES

Introduction

The creation of Authorities has a long and illustrious history in Pakistan. The Water and Power Development Authority (WAPDA) is one of the most influential organizations in the country. The Lahore Development Authority, chartered in 1975,recently received a $90 million loan from the World Bank. Other Authorities in Pakistan raise money, receive loans, control expenditures, direct departments, and plan and execute projects. The Authority model is an attempt to streamline the

1On the drawing board since the Master Plan was initiated in 1987 was the formation of a Development Authority for D.G.Khan. It was formally created in January 1988. In response to a special request from the Planning and Development Department, the Master Planning Team provided recommendations to rearrange the institutions supporting barani development on February 8, 1988. A central feature of the proposal was the establishment of the Potwar Development Authority, which would serve as a coordinator of multisectoral development projects and the umbrella to the Potwar Integrated Agricultural Development Project currently under design for funding by the Asian Development Bank. On February 16, 1988, the Chief Minister of the Punjab announced the "formation of a Development Authority for the rainfed agricultural areas of the Rawalpindi Division." *The Pakistan Times,* February 16,1988,p.8.

actions of government by bypassing the rigidity of formally established line department charters and integrating the activities of several agencies or departments in the interest of more rapid development.

But some Development Authorities do not have the charter, staff, funding, or influence to promote development. The Authority model, even with a legislative sanction, does not guarantee a successful coordinating or integrating organization.The more broadly defined the responsibilities of an Authority and the more entrenched the departments operating within its arena, the less likely that the Authority will establish a presence and contribute to rapid modernization.

The Development Authority Model: Description and Experience

Two Development Authorities operate in the rural areas of Punjab Province where rainfed agriculture is the economic mainstay of the population. Because the barani areas, with their more limited resources bases, are less densely populated than irrigated areas, they attract less investment from the public and private sectors.The two Development Authorities were established to remedy this imbalance. They were also established to indicate the government's concern for and commitment to development of these areas, in response to strong local demands for increased levels of public investment.

Two areas in particular were selected for special treatment due to a combination of their economic lag and their inability to compete for funds with more populous tehsils. In the northern part of the province, the tehsils of Murree and Kahuta were combined in 1973 under the auspices of the Murree-Kahuta Development Authority. In 1976, the Cholistan Development Authority covering Bahawalpur Division was constituted. An examination of the two Authorities and a review of plans being formulated for a third and fourth Authority suggest the potential of this organizational form.

The Murree-Kahuta Development Authority

The Authority was originally established in 1973 and shortly thereafter disbanded. Following this false start, the authority was reactivated in 1986.2 The geographic jurisdiction was defined as all Murree and Kahuta tehsils except the urban areas.

Several exceptional characteristics of the area are mentioned in discussions concerning the need for focusing attention on Murree and Kahuta.3 Unemployment tends to be aggravated by low literacy rates and skill levels. The area is considered to have a fragile and limited natural resource base, which presents two types of problems. Seasonal population peaks in the summer place a strain on natural and manmade resources.And because natural endowments appear unable to provide a _____

2"The Murree-Kahuta Development Authority Act, 1986," *The Punjab* Gazette, Notification, January 12,1987.

3 Interviews with Murree-Kahuta Development Authority, October 6, 1987.

livelihood for the permanent population, the able-bodied men are forced to migrate in winter in search of employment.

Organizational Structure

The organization of the Authority has evolved as a result of considerable discussion about the best arrangements for undertaking a charter that emphasizes development of the social infrastructure and forestry sectors.4 The members of the Board governing the Authority include the Secretaries of the other line departments in the province, the Chairman of the Planning and Development Board, the Commissioner of Rawalpindi Division, and the Director General who serves as Secretary and is the executive and operational head of the Authority.

The Authority is focused on a small engineering cell. Its staff includes one grade-18 and three grade-17 engineers who review the work of consultants hired by the Authority and provide guidance on engineering issues.

Development Priorities

The Authority takes its development objectives from the Prime Minister's Five-Point Program. Listed in order of priority, the activities to be emphasized are education, drinking water supply, forest conservation and development, health,improvement of the role and status of women in the economy, and tourism. The Director General of the Murree-Kahuta Development Authority feels that priorities have been correctly set and that these activities are necessary for creating the conditions that must precede a vital local economy.5

Toward this end, the Authority has recently developed an Umbrella Plan to develop the area. The plan is expressed as a PC-1, the standardized presentation prescribed by the Planning Commission to detail the execution of a proposed development activity. This Umbrella Plan was presented in mid-October 1987 to the Planning and Development Department in Lahore, and will be subjected to staff review culminating in the drafting of a working paper, which will then be considered for funding by the Provincial Development Working Party (PDWP).6

The Chief Minister, Punjab, presides over the Authority and is assisted by the Minister in Charge, in this case the Minister who oversees the Forestry Department. The notion of a Minister in Charge arises from the fact that an Authority, like any autonomous body created in the country, must be linked to a department headed by a chief elected official to integrate it into the formal organizational structure. The department that is selected is referred to as the "controlling department" and is usually chosen on the basis of the relevance of that department's work to the mission of the autonomous body in question.

5 Interviews with the Murree-Kahuta Development Authority, October 6,1987.

6 See Annex for the details of the planning and project review and approval process used by the provincial government of the Punjab.

The purpose of the Authority is considered by the Director General to be that of expediting development through project execution, and not merely working through the normal channels by coordinating the work of the line departments. Toward this end, the powers and financial resources afforded the Authority appear well attuned.

Funding and Projects

The Authority receives a block allocation to execute development projects. For both the 1986-1987 and 1987-1988 fiscal years -- the only years that the block allocation has been given -- the provincial allocation as indicated in the Annual Development Programme (ADP) was Rs 29 million, or approximately $1.7 million.Some of these funds are used to design and carry out small, mainly self-help efforts,such as school rebuilding. For these projects, the Director General analyzes the need by comparing existing facilities with government-established standards for adequate service levels. He decides upon the program for achieving the desired levels of services and the specifications such as size of buildings and construction materials, locational priorities, and phasing of the work. The work itself is left up to project committees, composed of local residents, and is supervised by an engineer on the staff of the Authority, who releases funds against actual progress in completing the construction.7

In the case of larger projects, this block allocation is used to contract with consultants to do the design, costing, and feasibility studies; draft project proposals for funding; and provide supervision during project implementation. The Authority uses organizations such as National Engineering Services of Pakistan (NESPAK) to do this work, rather than maintaining a large professional staff.

Although the block allocation is small, it is used as seed money, enabling the Authority to design projects that stand a reasonable chance of bringing in additional development resources from the federal government, a greater share of the resources expended by the line departments, and possibly external donor-provided funds. The Authority works with the provincial line departments in formulating project proposals (PC-1s) and submitting them to the Planning and Development Department for inclusion in the ADP. If included in the approved ADP, these projects can be sanctioned -- in effect approved -- for execution and implemented by the Authority's Development Committee -- consisting of the Director General and departmental directors -- if the cost is under Rs 40 million.

In the case of foreign assistance, that the Authority has resources to engage in planning provides it with visibility and an advantage over other areas. The Islamic Bank, for example, has recently sent a mission to discuss possibilities for funding some activities proposed under the Umbrella Plan. Without such projects and plans,attracting donor interest would be far more difficult.

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7 The execution of small development projects by project committees composed of local residents, with oversight by the responsible government technical representative, is a normal implementation method for projects funded through and administered by the Local Government and Rural Development Department.

The Cholistan Development Authority

The Cholistan Development Authority, established in 1976, was empowered to undertake a wide variety of functions.8 The Cholistan area is a large expanse of very arid land with few inhabitants in permanent settlements and little organized agriculture. The harsh conditions and very low level of development justified special attention from a Development Authority.

Organizational

The Authority is headed, as is the case in Murree-Kahuta, by the Chief Minister, with the Chairman of the Planning and Development Board, the Secretary of the Board of Revenue, the Commissioner of Bahawalpur Division, and elected members of the national and provincial assemblies as members.

For day-to-day management, the Authority has a modest staff consisting of three professionals and a Managing Director. This equates roughly with the staffing the Murree-Kahuta Development Authority.

In 1985, the Cholistan Development Authority was moved from the administrative control of the Board of Revenue, which controls much of the land in the area, to the control of the Planning and Development Department. Between 1982and 1986, the Authority executed 25 schemes, with the assistance of the line departments. These schemes were primarily the distribution of improved breeds of animals and the building of social infrastructure such as schools, veterinary dispensaries, and wells. Additionally, several feeder roads were constructed during this time.9

Development Priorities

Among the responsibilities listed in the Cholistan Development Authority Act of 1976 were:

> Cultivation, afforestation, leveling, reclamation, and privatization of government land for production purposes;
>
> Provision of irrigation structures, drinking water for people and animals,and groundwater surveys;
>
> Planning and construction of towns, villages, and settlements, with communications and transportation facilities, schools, hospitals,and so forth;

8"The Cholistan Development Authority Act, 1976," *The Punjab Gazette.*Notification, July 21,1976.

9 Cholistan Development Authority:An Introduction (Bahawalpur.Abdul Wahid Printing Press, undated).

· Productive enterprises and marketing of livestock, rural industry, trades, and so forth;and;

· Conservation of forests and wildlife, exploration of mineral resources.10

Beyond these areas of responsibility, the Authority has been given specific regulatory functions. These incude regulating activities on government land within the Cholistan area,such as:

Clearing and subdivision of government land;

· Quarrying of stone and the burning of lime and charcoal;

· Admission, herding,and feeding of cattle; and

· Felling or burning trees.

In theory, the Authority exercises control over all development work or projects within the area of jurisdiction. Moreover, the Authority is empowered by the act to require a government agency or local body to undertake any specific developmental activity, but if the job is not finished in compliance with the order of the Authority,it may complete the activity itself. Actual practice does not reflect an Authority that undertakes sweeping independent actions or that dictates the activities of the line departments according to a broadly defined development plan.

.The Cholistan Development Authority, although equipped with limited executing powers, has development objectives that guide it in conceiving project ideas and evaluating investments proposed by the provincial line departments. Its long-term objective is the development of the area's soil resources. In the short term,the provision of drinking water, water harvesting, and improvement in human and animal health are the primary areas of attention.

Funding and Projects

Unlike the Murree-Kahuta Authority,the Cholistan Authority no longer receives a block grant allocation. In the past several years, block grants from the provincial government were provided to the Authority, increasing from Rs 2.2 million in 1980-1981 to Rs 10 million in 1984-1985. Beginning with the 1987-88 fiscal year, however,these resources for the Cholistan region were allocated through the provincial line departments operating in the area. There is a feeling expressed by the Managing Director that this change in funding from the Authority to line departments has resulted in a net decline in financial resources of approximately Rs 2 million,although, from a reading of the ADPs, it is difficult to confirm this contention.This significant revision in channeling development resources was preceded by a change in the controlling department within the provincial government from the Board of Revenue to the Planning and Development Department.

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10 "Cholistan Development Authority Act 1976," Notification No. 2554-79/3890-CII,Punjab Government, August 1979.

Needs expressed at local levels appear to have influenced the decisions of the Authority. As a result, development of social infrastructure has been emphasized,rather than directly productive activities and enterprises that might have led to stimulating private initiative and resources. It is difficult to argue against the need for drinking water and basic health services, particularly in the arid lands of Cholistan. However,social needs appear to have received most of funds provided through block allocations by the provincial government, perhaps lengthening the time required for the area to be economically strengthened.

The activities of the authority are now limited to identifying project ideas and coordinating the design and execution work carried out by the line departments. The only activities that the Authority implements -- from design through execution -- are self-help schemes similar to those described for the Murree-Kahuta Authority.

The Authority is sponsoring a pre-investment study in the form of a PC-2 Pro-forma for Preparation of Comprehensive Plan for Development of Cholistan Desert in Punjab Province.11 This project has been approved by the Provincial Development Working Party. It is a plan to create a development program for the area. The project calls for funding of Rs 18 million, and is modeled on the Barani Master Plan Project, being executed under ABAD's umbrella. The project, however, appears to be a long way from sanctioning and funding.

A Proposal for New **Development Authorities**

In January 1988, the provincial government announced the formation of the D.G. Khan Development Authority, with the Commissioner of the Division as the Board Chairman and the Department of Local Government and Rural Development as the administrative home. The short formal notification of formation contained no details of the responsibilities of the Authority, charter, functions, or staffing. Much has to be accomplished before this Authority becomes an important force for development in this arid -- four inches per year rainfall -- barani zone.

The recently announced Potwar Development Authority was a surprise move by the Chief Minister of the Province, apparently in response to local demands for faster action to speed development in the largest barani zone. As yet, there are no indications of the organizational patterns to be established. Since the barani zone and the regular line department activities in four districts are essentially coterminous, a Development Authority could simply create another layer of governmental authority between district operations and Lahore policy and decision making. The new Authorities will be given an initial block grant allocation, but the set-up grants will not indicate the ful1 funding available.

The area Development Authority model represented by the Cholistan Development Authority and the Murree-Kahuta Authority is still undergoing testing and refinement. Meanwhile, two additional authorities are emerging. These developments must be viewed together with the discussions on the future of the agency model, exemplified by ABAD, for organizing development within the barani

11 Preparation of ComprehensivePlan for Development of Cholistan Desert in Punjab Province,Cholistan Development Authority, undated.

zones. Recommendations can then be made about appropriate realignment **development institutions for the barani tract.**

Specifying an Appropriate Development Authority Model for Barani Zones

There are four major decision points in the establishment of a Developmert Authority for a barani zone:

Budget, revenue generation,and funding;

Interaction with line departments;

· Serving as a catalyst for locally demanded development projects; and

Institutional placement, direction, and staffing.

Providing Funds for a Development Authority

An Authority may be given the right to raise funds, borrow money, and act as an independent financing agent. In addition, the Authority may receive block grants from within the ADP, as well as specific funding for individual projects approved within the it. For a principal barani zone such as the Potwar, there are good reasons to provide the following funding avenues:

· Block grants to be used for seed money for.12

-- Special studies (Investigation and Survey Grants) that will provide the data required to justify locally identified development undertakings, either from the federal government or from foreign donors, and13

-- Trials of pilot activities that could become, when tested and proved,new development initiatives within the zone;14

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12 As the use of block grants to provide social services or small community -projects duplicates other ongoing funding channels and activities, itis not recommended as an expenditure by a restructured Development Authority.

13 This pattern follows the use of block grants provided to the Murree-Kahuta Development Authority.

14The generation of custom tractor-service establishments might be such 3trial. Incentives and arrangements for private sector involvement in custom tractor services would call for coordination with agricultural extension, livestock extension,range management extension, and credit facilities. Some seed funds to establish the viability of the custom tractor service model for the Potwar could speedthe introduction of what is alreadya significant trend toward mechanization.

Loans, allowing the Authority to receive funds based upon completed feasibility studies that demonstrate the economic viability of the enterprises to be supported by the Authority. (Although the federal government would receive loans that deliver economic returns to the country, the Authority would borrow money for specific income-generating projects in which a portion of the increased financial returns could be captured by the Authority to repay the loan); and

Project funding, from within the ADP, for specific activities approved by the Barani Development Board (see below) and funded for execution by the Development Authority.

Interaction with the Line Departments

Several models exist for strong Authorities with power over actions of regular operating departments or agencies. WAPDA has a set of activities that are reserved for that Authority, with defined points at which the responsibilities are transferred to operating line departments. The Lahore Development Authority (LDA) has the power to override another agency's activities within its jurisdiction and designate areas or activities as controlled, requiring specific approval from the LDA before initiation of activities within those designated areas. New responsibility has been provided to the Cholistan Development Authority to control the actions of line departments working within its jurisdiction. Alternatively, some Authorities have little or no control over regular operating agencies; instead the Authorities execute their own projects or provide loose coordination to the work of the line departments.

It can be argued that a rural barani zone requires the continuation of line department activities and that placing these activities under the control of an Authority would not improve efficiency or field operations. Instead, the Authority should serve as the Secretariat of a Coordinating Board, which reviews both ongoing and new single-sector projects and passes its recommendations to a special Bureau attached to the Planning and Development Department.15

In addition, the Authority should serve as the executing organization for multisectoral, integrated projects, in this instance for activities of the line departments operating under the Authority's direction. With this charter, the Authority coordinates activities that do not cross individual line department responsibilities and executes projects that require multisectoral integration.

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15 The third section -- on the institutional requirement for the barani tract -- details the interaction between the Development Authority and a special attached Barani Development Bureau of the Planning and Development Department. Whatever the organizational structure, if Planning and Development does not take seriously the recommendations of the Authority on line department activities, thus strengthening the voice of the Authority over single-sector projects, little effective coordination will be possible in the field.

Institutional Placement, Direction, and Staffing

In some barani zones, such as in the Potwar, the Commissioner of the Division is the obvious choice for Chairman of the Coordinating Committee that oversees the Authority. The Director General, or Managing Director, of the Authority and staff serve as the Secretariat of the Authority. A permanent staff manages the coordination responsibilities and oversees the individual projects or activities executed by the Authority. For principal barani zones, a professional staff of six with supporting personnel would be appropriate. The remainder of required staff would be seconded from specific line departments to oversee multisectoral projects,or funded within ADP-approved project.

All Authorities would be provided policy guidance by a policy coordinating committee, the Barani Development Board, headed by the Chief Minister. The Chairman of the Planning Board would serve as Deputy Chairman, with the Secretaries of line departments serving on the committee, along with elected representatives. The attached Barani Development Bureau to the Planning and Development Department would serve as the Secretariat to the policy committee.The Barani Development Board would substitute for the PDWP for all barani projects submitted by line departments, Development Authorities or the Barani Development Bureau.

Other institutional arrangements may be necessary when the barani zones span several divisions and when the zones are smaller, less populated, or require fewer public sector services. An optimum solution would be to establish the Potwar Development Authority along the lines recommended above and use the early years to improve upon the staffing, funding, and institutional arrangements to benefit other Authorities.

Conclusion

Development Authorities are popular and attractive solutions to lagging development in selected and contiguous geographic areas. But the Authorities, even when provided legislative sanctioning, must still compete for allocations of scarce development resources. There is a continuing tension between the provision of resources to an overarching Authority and to line department programs to undertake development activities. When the Authority has only loose coordinating power and no planning or operating staff of its own, it must use the services of the line departments. There is then further reason for the departments to lay claim to the resources and do the job themselves. This may be what has happened until recently in Cholistan.

The advantage of a Development Authority is its ability to coordinate disperate department initiatives in support of barani development and execute and implement multisectoral development projects. Activities that cross line departments and and other areas can be coordinated only by an umbrella organization with an Agency or Authority charter.

In this context, the Zonal Development Authority model holds promise for barani development. If the Authority's sole purpose is to provide self-help funding

and additional social services, these activities duplicate already existing programs and agencies. But if the Authority takes upon itself the responsibility for creating productive programs that span departmental boundaries and provide additional output and income to the area's inhabitants, its contribution can be valuable to barani development.

Zonal Authorities are not new institutions in barani development. They provide coordination for all barani development activities within a zone; a multisectoral Authority with execution responsibilities; and the appropriate charter, staffing, and funding to focus energy and attention on new development initiatives. Correctly established, Development Authorities can be positive additions to the institutional framework for the development of the barani tract.

THE AGENCY MODEL

Introduction

This section begins with the reasons for the creation of the Agency for Barani Areas Development (ABAD) from the recommendations of the Barani Commission Report. It then examines the "sanctioned" structure and responsibilities provided the Agency, followed by an analysis of the strengths and weaknesses of the organization.The final section, assuming that the intent of the Barani Commission was to establish a strong institution to promote barani development, lists the transformations required of ABAD to enable it to become a provincial-level organization that could provide the direction and leadership for rapid development of the barani tract.

The Barani Commission **Report**

Development resources are traditionally channelled toward areas providing the greatest economic returns and benefiting the largest concentrations of population. In Punjab, this has meant that the irrigated areas of the province have consistently received a disproportionate share of such resources. To redress the imbalance, the government constituted the Barani Commission in 1975 to address the development problems of the rainfed areas and make recommendations for action.

In its report, produced a year later, the Commission argued that recent industrial development and the Green Revolution in agriculture had bypassed the barani areas.16 The barani tract was characterized as a food-deficit area with serious environmental problems and limited income-generating activities.

The Commission concluded that the well-being of the population in the barani tract was best served by optimum conservation and utilization of its land, water,energy, minerals, plants, and animals. An integrated, interdisciplinary approach to the management of natural resources was seen, and the creation of a new autonomous authority to be known as the Barani Development Authority was

16 Government of the Punjab, Barani Commission Report, Planning and Development Department, Lahore, 1976.

recommended. It was to be responsible for data collection, data processing, research,detailed planning in various fields, coordination of different departments and agencies, execution of development projects, supervision of field and extension services,and evaluation.17

Central to this new institution was the creation of a Resource Management Division, together with two complementary facilities: a Technology Development Institute and an Education and Training Institute. The strategy was to be based on the involvement and participation of the various nation-building departments, with emphasis on the following key elements:

Development planning that focused on geographicallyspecific areas to achieve some degree of equity;

Resource management that revolved around both social and agricultural development activities to maximize benefits;

Sustainable growth and environmental improvementthrough increased production, full employment, savings, and reinvestment; and

· A viable organizational structure capable of planning and managing activities in the fields of agriculture, infrastructure, rural industry, and social welfare to implement a strategy for achieving integrated resources management within a geographically defined area.18

The institutional recommendations of the Punjab Barani Commission were only partially accepted by the Punjab government. Instead of the autonomous Authority proposed by the Commission, an Agency that serves as an attached department to the Planning and Development Department was created. The Agency was chartered to concentrateits efforts on facilitation, coordination, and monitoring development activities.

Agency for Barani Areas Development: Structure and Responsibilities

Some of the difficulties of ABAD may stem from limitations of the original charter and responsibilities set when it was established.19 While ABAD was charged with the overall coordination of all barani tract development, the institutional arrangements did not provide the necessary mechanisms to make a coordinating and monitoring system work. In response to this inability to direct the work of other agencies and departments, ABAD soon began to create its own projects and _____

17 Draft Report of Punjab Barani Commission, Chapter XVI,paragraph 1.

18 Agency for Barani Areas Development, ABAD at a Glance, Information and Publication Cell,Rawalpindi,1983.

19 Other difficulties stem from the interaction between ABAD and the parent organization, the Planning and Development Department. At times, ABAD has had smoother interaction and better support and backing than at present and, as a result,has been a more effective organization.

implement donor-funded projects in barani aeas. The history of the establishment of ABAD and the Barani Development Board is illuminating as the institutional framework for barani development is in the process of being restructured.

On May 15,1978, the Chief Secretary of the province submitted a notification that established the ABAD, which "will function as an Attached Department of the Planning and Development Board/Department."20 On May 18, 1978, the Chief Secretary provided notification that six organizational units of the Departments of Agriculture "have been declared Constituent Units of the said Agency and the Heads of Office as members thereof."

On August 6, 1980, ina consolidation of previous orders, the Chief Secretary announced the creation of a Board that would assist the Director General (DG) of ABAD and provided the Board with functions and powers as follows:

> The Board may co-opt divisional officers concerned when dealing with matters relating to a Division other than Rawalpindi.
>
> The Board will exercise overall operational control with respect to the functions of the departments represented on it. These functions will include planning, budgeting, inspections, monitoring, evaluation, and coordination of the implementation of projects by different agencies. In particular, the Board will act as a clearinghouse for development schemes falling within the competence of the departmental committee and the PDWP.21

Because ABAD has no budget for implementing development activities, nor any financial control over those departments that do, monitoring and coordination were envisioned as principal responsibilities. This coordination was to be established by assigning operational control over the following departments or organizations working in barani areas:

Director Soil Conservation(Agriculture Department);

Director Barani Agriculture (Extension) Project Rawalpindi (Agriculture Department);

Director Agricultural Engineering (Agriculture Department);

Director Barani Agriculture Research Institute(Agriculture Department);

Project Director Small Dams Organization (Irrigation Department);

Director Local Government and Rural Development Rawalpindi (Local Government and Rural Development Department;)

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20 Notification of the Government of the Punjab Services General Administration and Information Department, May 15,1978.

21 Notification No. Cab-II-6-6/78, Lahore, August 6,1980.

· Director Planning and Development Rawalpindi Division(Planning and Development Department);

· Deputy Registrar Cooperatives Rawalpindi (Cooperatives Department); and

Conservator of ForestsRawalpindi (Forestry, Fisheriesand Tourism Department).22

Coordinating **and Monitoring Barani Development**

The line departments operate within their own administrative and financial coordination takes place with the Planning and Development Department, which reviews and approves the submission for the ADP. To influence this existing system,ABAD, acting as an arm of Planning and Development, must affect the manner in which the line departments set priorities, commit funds, and manage development projects that have impact on barani zones. To accomplish this assignment, ABAD has been given operational control over the assigned departments and agencies. The meaning of this control is not clear, and it seems to be executed in several different ways,depending upon the funding source for barani projects.

First,for those operations of the line departments that are not funded by ABAD (that is, not included in an ABAD multisectoral project), operational control means that the officers of the assigned departments or agencies are available to the DG ABAD for special travel, information, studies, repots, or services in the interest of barani development. The operatingprograms and projects of these departments are, in theory, sent to the Barani Development Board for review -- the "clearinghouse" function specified in the sanctioning documents. This Board is chaired by the DG ABAD and now contains, in addition to the Rawalpindi heads of the departments named to be under ABAD's operational control, the elected heads of each concerned District Council, as well as representation by members of the Provincial Assembly.

Theoretically, the Board reviews all line department projects and programs in barani areas submitted from the line departments and sends minutes of the comments made in Board meetings to Planning and Development Department for its consideration. In this role, ABAD serves as the Secretariat for the Board, acting as a clearinghouse for programs and projects affecting barani development. But no follow up action is taken, and ABAD does not sit on the PDWP when the line department's projects are considered. There is little indication that the comments on projects contained in the minutes of the Barani Development Board have any impact on the programs being planned or managed by individual line departments.23

22ABAD, "Organizational Chart of Agency for Barani Areas Development,ABAD position as of February 8, 1988.

23 The high rate of absenteeism from appointed members of the Barani Development Board provides an indication of the limited importance of Board reviews of line department projects.

Second, for those line department activities that are incorporated within a multisectoral project executed by ABAD (or under the ABAD umbrella), there are different control mechanisms to support monitoring and coordination.24In two projects, ABAD is the umbrella agency executing the projects that are implemented by project management units (PMU). Project Directors of the PMUs are deputed to ABAD, reporting directly to the DG ABAD. The DG ABAD also serves as the Chairman of the Project Coordinating Committee.

In this instance, special ABAD authority has an effect on the staff seconded to work with ABAD on the two projects in its portfolio. ABAD's controls include preparation of annual confidential reports on staff seconded to ABAD, provision of salary from project budgets during this time, approval of field trips, and vacations.

Limitations ABAD's Monitoring and Coordination Responsibilities

The scope of ABAD's and the Barani Development Board's responsibility covers the entire barani tract (minus the Development Authorities that have not, to date,been included in ABAD's jurisdiction). The directors of the agencies or departments under ABAD's operational control, however, do not represent all-important development activities or all barani zones, since many subordinated directors have jurisdiction only over their agency's activities in Rawalpindi Division. For example,the activities of the Livestock Department in barani areas are not included under ABAD's operational control.25 This is a critical omission in tightly constructed barani agricultural systems in which animal production plays an important role in farm income.

More fundamentally, the individuals serving on the Barani Development Board have limited jurisdiction over the barani activities of their own departments. Thus,the Director of Barani Agriculture (Extension) has jurisdiction only over agricultural extension activities in Rawalpindi and Sargodha divisions. The Deputy Registrar of Cooperatives has jurisdiction only over Rawalpindi Division. In practice, this means

24 The Barani Area Development Project, funded by International Fund for Agricultural Development (IFAD) and the Asian Development Bank, provides the clearest indication of ABAD's authority over the line departments assigned responsibility under the multisectoral project.

25 Originally, within ABAD was a section concerned with the training of paraveterinary villagers, to be headed by the Deputy Director for the Livestock Department for Rawalpindi Division. He was assigned the additional responsibility of supporting a training program for paraveterinarians under ABAD projects. Over time,this responsibility was reclaimed by the Livestock Department, although the residual activities of the unit still physically exist at the ABAD office, under ABAD's operational control. Since this unit was to be an integral part of ABAD, there apparently was no reason to have operational control over the activities of the Livestock Department Thus, Livestock is not included with the subordinated departments under ABAD's operational control. ABAD also has no responsibility for the Barani Livestock Production Research Institute at Kherimurat. The paraveterinary training program has been eliminated from the activities supported by the Department of Livestock, which found the results unsatisfactory.

department activities outside of Rawalpindi Division. The Director of Soil jurisdiction within its sector over the greater part of the barani tract.26

ABAD's charter suggests that the Board may "co-opt divisional officers This provision notwithstanding, the agency experiences difficulties in operating effectively throughout the barani tract under its jurisdiction.27

ABAD's only real capacity to coordinate or monitor the line department program in barani areas comes from its influence on the Planning and Development Department, as the Barani Development Board makes recommendations on particular projects presented by line departments for inclusion in the ADP or reviews ongoing projects. There is little evidence that Planning and Development Department makes use of the comments of the Barani Development Board or the perspectives of ABAD when considering barani projects. Thus, the monitoring and coordination role over barani development projects proposed andI implemented by all departments, which was defined by the Barani Commission and originally sanctioned as ABAD was created, is not being fulfilled by ABAD.

Agency for Barani Areas Development: Functions

ABAD was created as a dependency of the Planning and Development Department of the Provincial Government. As such, the DG ABAD reports directly.to Planning and Development. The following sections review the internal ABAD organizational chart,compare the functions defined by ABAD with the organization's capacity, and discuss ABAD's linkages with the Planning and Development Department. Another section analyzes ABAD's performance against expectations and internal capacity.

Organization and Staffing

ABAD's structure is presented in Exhibit II-1. The permanent, or nondevelopment, budget portions of ABAD's responsibilities encompass the following professional staff positions:28

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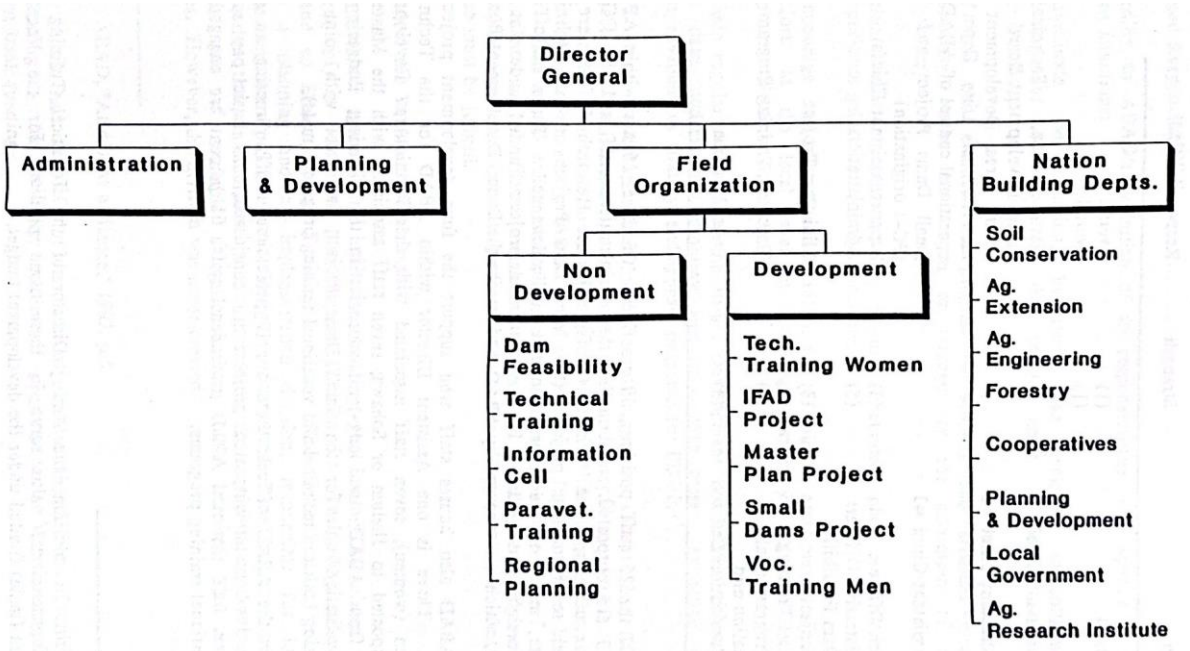
26 This Directorate has been enterprising in its support of ABAD. The Soil Conservation Organization received the lion's share of ABAD's first donor-funded multisectoral project.

27 Governor's Inspection Team Appraisal Report on ABAD, Government of the Punjab, Lahore, March 24, 1983.

28 These assignments and staff are as interpreted by the Master Planning Team capturing the spirit of the organization rather than its technical staffing pattern.

EXHIBIT II-1

Organization Chart
Agency for Barani Areas Development



Position	Strength	Responsibilities
DG ABAD	(1)	Overall
Chief	(1)	Overall
Assistant Chief	(3)	
Assistant Chief #1:		MasterPlan, Technical Training,Barani Development Board
Assistant Chief #2		Barani Area DevelopmentProject and the ADP of Line Departments under operational control of ABAD
Assistant Chief #3		Small Dams Project and Miscellaneous (PC-1 origination)
Research Officers	(3)	Support Assistant Chiefs
Administratve Officers	(5)	Administration
Mini Dam Feasibility Project	(3)	Mini Dam Project
Technical Training Program (male)	(6)	Technical Training Program
Information and Publication Cell	(3)	Press Relations

Of the 25 staff positions, 19 are filled. Of these, 16 are within ABAD, and the other 3 are outposted. Subtracting the administrative staff and the DG and Chief,only six officers, three Assistant Chiefs, and three Research Officers are not directly assigned to permanent projects (the Mini Dam Project or the Technical Training Program, male) or the information and publications cell. These six officers provide the oversight and guidance for the four main projects funded under the development budget, which are executed by ABAD, and service the Barani Development Board.29

ABAD also houses staff who support the four development projects mentioned above. There is one Assistant Director within ABAD for the Technical Training Program (women); seven staff associated with the Barani Area Development Project,all outposted to Jhelum or Sohawa; seven staff associated with the Master Plan, none at or from ABAD; two long-term vacancies in the Planning, Budgeting, Monitoring and Evaluation unit for the Small Dams Project and staff with joint appointments overseeing both the technical and vocational training programs (male).

In the ABAD offices, there are 17 professional staff, directing an operation that includes, when all outposted projects are considered, 529 basic pay scale employee positions. Of the total ABAD professiona staff, 61 percent are engaged in technical or vocational training programs.

29In addition, the Acting Director of the Technical Training Program and his outposted staff also serve in these same positions for the Vocation Training Program (male) funded under the development budget.

Assumed Responsibilities

According to ABAD's definition of its responsibilities, the Agency is to fulfill the following functions:

Coordinate the planning, budgeting, and efficient implementation of development activities in the barani areas by the nation-building departments;

Monitor and evaluate the progress of projects and schemes and, where necessary, revise the targets or arrange for the allocation of additional resources;

Initiate and develop creative, original integrated plans on the basis of experience gained and surveys conducted;

Encourage and stimulate the integration of public and private development efforts at the local level by "infusing missionary zeal and encouraging optimum field activities"; and

Chair regular meetings of the Barani Development Board and discuss progress to date, address any problems that may have arisen, exchange views on improvement of strategy, and approve proposals for PDWP.30

ABAD does not create plans for barani development, except that the Master Plan Project is administratively attached to the agency.31 ABAD does not coordinate, monitor, or evaluate the barani activities of line departments. There are no surveys undertaken by ABAD, and no original integrated plans based upon experience. But ABAD has carved out a niche in the implementation of specialized barani technical and vocational training programs and in the execution of donor-funded multisectoral development projects. It is on these activities that ABAD's performance must be judged.

Technical and Vocational Training

For manpower training and institution building, the Barani Commission proposed establishment of a Resource Management Division, a Technology Development Institute, and an Education and Training Institute. The first of these was to have been both a planning and an implementation division, responsible for identifying resource management problems and designing integrated development interventions.It was intended that, in confronting these problems, the interventions would result in the rational use of available natural resources, labor, capital, and appropriate technologies. However, the division was never created.

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30 ABAD, "ABAD At a Glance," 1982,p.5.

31 ABAD had no staff of its own attached to the Master Planning effort,nor participating in the feasibility studies of projects to be considered for Asian Development Bank funding.

The Technology Development Institute was to have undertaken research and development in the following fields:

Animals and plants;

· Climate, water, and soil;

· Industry and mining;and

· Economics and sociology.

The first two areas are being served through the Barani Agricultural Research Institute in Chakwal, which has been functioning since 1983, and the Barani Livestock Production and Research Institute at Kherimurat, which has been operating since 1980. The only direct link of either of these institutions with ABAD is through the membership of the Director of the Barani Agricultural Research Institute on the Barani Development Board. Agricultural research is a responsibility of the provincial Agriculture Department and research in livestock is that of the provincial Livestock Department. The last two recommendations of the Barani Commission --concerning industry, mining, economics, and sociology -- were not implemented.

Establishment of an Education and Training Institute was intended to prepare people for management positions in barani development and for training villagers and workers in specific skills required within rainfed areas. Two imnportant initiatives resulted from these recommendations. The first was the creation of the Barani Agricultural College and the Barani Agricultural Training Institute, responsible for training agricultural officers and field assistants who wish to specialize in rainfed agriculture. Both institutions are managed within the Provincial Agriculture Department.

The second initiative was the creation of a series of small technical training institutes, controlled financially, administratively, and operationally by ABAD. The implementation of this objective was carried out, and the following have been completed:

	Number of Centers			Number of Persons Trained		
	Female	Male	Total	Female	Male	Total
Technical Training Centers	11	16	27	4,456	9,310	13,766
	1			*4,910*		

Vocational Training Centers	c	15		*9,514*	
	3		*454*		
					663
					14,429
	9	23	42		

Over 7,000 young men and women have been taught marketable skills, such as electrical, clerical, mechanical, and building trade. This is one area where the singular contribution of ABAD has been visible and advantageous.

The question is whether a provincial-level Barani Development Agency should be concentrating on graduating a few hundred vocational trainees per year.32 The programs are well received and well respected, sought after by rural youth,particularly school-leavers who do not qualify for other government-provided technical and vocational training. Vocational training provides positive contributions to development for a few individuals but rarely results in jumps to new levels of income and production for a large population. (There will soon be 12 million barani residents.)

ABAD is not to be faulted for generating a successful technical and vocational training program. But its focus on training indicates the limitations of ABAD's capacity to influence larger and more significant aspects of barani development.

Executing **Multisectoral Projects**

The two principal activities undertaken by ABAD have been the initial identification and coordination of the Barani Area Development Project and the coordination of the Asian Development Bank-financed Small Dams Project.33 The Barani Area Development Project pursues a strategy heavily biased in favor of soil conservation to promote the development of rainfed agriculture and livestock production in Chammal and Sohawa -- about 87,000 hectares, located in the districts of Sialkot and Jhelum. The components of this project include soil and water conservation, extension services, livestock development, cooperative development,staff training, and short-term expatriate technical assistance. Started in 1981, the project was scheduled to terminate in 1987 at an estimated cost of Rs 164 million,with a foreign exchange component of Rs 66 million. The total amounts expended up to the end of the fourth year of implementation are presented in Table II-1.

The line departments with technical expertise, construction ability, and service delivery experience contributed heavily to the project design. Coordination, sifting and ranking components, and packaging were let to ABAD. This role as coordinator of the final product is visible in the PC-1 ABAD prepared recently for a third principal barani multisectoral development project.

In the Barani Area Development Project, the role of ABAD is to direct the project and chair the Project Coordination Committee. The implementation organization, a PMU, reports directly to the DG ABAD. The PMU is staffed by professionals seconded to ABAD for service with the project. In the case of the Barani Agricultural Research and Development Project, for example, there are two field offices -- one in Sohawa and the other in Shakargarh -- each headed by an Assistant Director seconded from the Soil Conservation Directorate. A Project Director, in this case a federal civil servant seconded to the project, oversees the project.

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32 Fifty-eight,or 62 percent, of the total staff assigned to ABAD above basic pay grades are identified as being in technical and vocational taining programs.

33 ABAD also produces PC-Is for multisectoral projects, serves as the umbrella for the Master Plan, and attends to other cross-departmental responsibilities of barani development.

TABLE II-1
BUDGET BREAKDOWN FOR BARANI AREA DEVELOPMENT PROJECT, 1981-1985(Rs 10 million)

Component	Amount	Percentage
Soil conservation	13.34	72.4
Agricultural extension	0.96	5.2
Livestock development	0.58	3.1
Cooperative development	0.47	2.5
Technical training	0.07	0.4
Staff training		
Consultants	0.67	3.6
Project management unit	2.16	11.7
Buildings	0.18	1.0
Total	18.43	100.0

Source:

Agency for Barani Areas Development,Report on Barani Area Development Project (IFAD 48-PA) for 1984-1985,Project Management Unit, Jhelum,1985.

The Project Coordinating Committee, made up of the representatives of the line departments, provides a forum to work out issues associated with implementation.Cooperation among the various departments in a multisectoral project effort appears to depend upon several factors, not only the coordinating committee. In particular,having a project director of comparable grade to the department directors and with access to departmental secretaries at the provincial level is an important ingredient for making such a complex effort work.34

Execution of the Small Dams Project is less complex for ABAD, as the Project Director is attached to the Small Dams Organization under ABAD's execution umbrella. This leads to a lower level of ABAD responsibility in the operations of the project.

34 Agency for Barani Areas Development,Mid-Term Benefit Monitoring and Evaluation Report on Barani Areas Development Project (IFAD), Project Management Unit, Jhelum,1985.

Recently, ABAD has prepared the PC-1 for a third major multisectoral barani **project, the** Integrated Land and **Water** Resources Development Project, approved **after review and modification,** by **the PDWP,35**

The Linkages between ABAD and the Planning **and** Development Department **in Lahore**

ABAD interacts with and reports to the Planning and Development Department through more than four different cells or sections. Final reporting authority is vested in the Member, Monitoring and Evaluation, who serves as the senior Planning and Development officer with direct ABAD oversight. Operational direction is provided by the Chief ABAD Cell, Planning and Development, who is supported by an Assistant Chief, ABAD Cell, and a Research Officer, ABAD Cell.

ABAD informs the ABAD Cell in Planning and Development of its activities, and obtains clearance for its operations and authorization for expenditure of financial resources. Intra-agency postings and staff transfers have to be authorized by the Establishment Section of Planning and Development, while interagency postings are authorized by the Services and General Administration Office. Special development programs must be cleared and authorized by the responsible cell within Planning and Development; for example, ABAD's technical training program for women was reviewed and is coordinated with the Women's Cell of Planning and Development.Contacts with foreign donors or those which concern foreign-funded projects flow through the External Capital Assistance Office of Planning and Development.

Evaluating the Institutional Alternatives

The institutional issue to be resolved for barani development is not how well ABAD has provided vocational, and technical training, executed the BARD project, or served as an umbrella for the Small Dams Project. Rather, the issue is one of alternative institutional structures that might better perform these services or the improvement in ABAD's capacity to increase development results in the barani tract.

It seems clear that barani development, whether from the perspective of the Barani Commission or the Master Planning Team, requires an integrated approach that spans traditional line department subject fields. There must be an executing agency above the line departments that coordinates actions, directs traffic, and obtains the development benefits not possible from single-sector activities. In two projects, ABAD performs this role. The only other institutions that can assume this responsibility in the Punjab government are Zonal Development Authorities. The decision to be made is whether to continue a provincial-level implementing institution (ABAD) to direct multisectoral projects or to focus resources and attention on Barani Zone Development Authorities,36

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35 This proposed project was reviewed in a separate study prepared by the Master Planning Team.

36 See Section Three for an expanded description of the choices available for an improved institutional framework for barani development.

Transforming the Agency for Barani Areas Development into an Effective Barani Development Institution

ABAD's Capacity to Affect Barani Development

The contributions of ABAD are training rural youth and serving as an umbrella for multisectoral projects necessary for barani development. Training has been discussed previously; the critical dimension for the future of barani development is the role of ABAD as an executor of cross-sectoral projects.

Fundamental structural weaknesses in the ABAD charter prevent the Agency from becoming what was originally envisioned by the Barani Commission as a powerful institution to promote barani development. These limitations of charter,staff, responsibilities, authority, and funding have been well documented by ABAD itself, and by inspection reports of the Governor's Office and the evaluation wing of the Finance Office. A 1982 document produced by ABAD in an attempt to strengthen the institution, entitled ABAD at a Glance, makes the following points:

· The organization is too small for the task at hand.

The operational structure is in skeletal form and lacks the capability to undertake the planning and evaluation of projects.

The Planning and Evaluation Cell, the Information and Publication Ce11,and the Administrative Branch are neither adequately staffed nor adequately coordinated.

The organization has no legal framework through which to exercise effective control over field staff.

· In the absence of any legal basis, coordination of the activities of all the nation building departments remains unrealized.37

The last two points are repeated in more recent ABAD documents.38The more obvious shortcomings of ABAD that relate to its limited charter are:

Lack of administrative and financial control to complement its operational control;

No resources of its own;

· Insufficient technical expertise;

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37 Agency for Barani Areas Development, ABAD at a Glance, Information and Publication Cell, Rawalpindi, 1982.

38 Agency for Barani Areas Development, A Periscope on ABAD, Information and Publication Cell,Rawalpindi,1983.

Difficulties attracting and retaining adequate professional staff;39

Limited monitoring and evaluation capability;and

Given the physical vastness of the barani tract, locational and logistical difficulties.

ABAD, at present, cannot live up to the demands of promoting establishing,planning, monitoring, evaluating, and coordinating barani development projects. It can provide limited development benefits from its own projects, or those few foreign donor-funded projects that it executes. But that is all that can be expected, given the existing organizational framework in which the Agency operates.

Rebuilding ABAD into an Effective Barani Development Organization

There could be solutions to ABAD's problems if a strengthened provincial-level barani Authority is the desired institutional model. To make ABAD an effective provincial-wide, planning, monitoring, evaluating, executing, and implementing,organization, the following steps should be taken.40

1. **Provide ABAD with independent structure and charter, as an Authority for Barani Areas** Development. This re-authorized ABAD will then have an independent service structure, with the incentives necessary to sustain posting in difficult remote locations and deputation allowances for key staff.

2. Provide the new ABAD with **the authority** to vet **all barani** projects submitted by line departments. Give ABAD the status of an administrative department, with sanctioning power up to Rs 4 million. ABAD would then chair the Departmental Working Party for Barani Projects (prior to being submitted to PDWP), in conjunction with Finance, Planning and Development,and the Secretary of the concerned department. Include ABAD on the final

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39 The difficulties of attracting and keeping competent staff in ABAD are legendary. The difficulties of staffing the position of Chief, the second in command,are illustrative of many of the positions within ABAD. The chronology is as follows:

May 1985, the Chief departs ABAD.
May 1985, new Chief posted, no prior experience.
August 1985,Chief reassigned to Planning and Development.
September 1985,new Chief assigned, died January 1986.
June 1986,new Chief assigned, retired March 1987
December 1987, new Chief assigned, will retire April 1988.

One position of Assistant Chief was vacant for 15 months, until March 1987,while a second,filled in April 1987, had been vacant since 1985.

40 The Master Plan does not recommend this solution, for reasons explained in the following section. Only if the alternatives detailed in the following section of this chapter are found unacceptable should a strengthened ABAD be sought to promote barani development.

clearance Board along with Planning and Development and Finance.This authority would ensure that ABAD would be the coordinating and monitoring point for all barani projects. Give ABAD the responsibility for commenting on all provincial-levelprojects that will have impact on barani areas.

3. **Provide ABAD with independent block grant funding** to enable it to **undertake** high-priority **barani development** projects. Some high-visibility projects funded quickly by the revitalized ABAD could show the capacity of the organization to affect barani development and mitigate the political demand for a shift to Zonal Development Authorities.

4. **Provide ABAD with the staffing and charter to establish regional** offices in **each barani** zone. These offices would provide a focus for development activities (planning, monitoring, and coordinating) for those projects directly executed by ABAD. The barani zone offices would take the place of the Zonal Development Authorities for large multisectoral projects.

5. Provide ABAD with the staffing and funding to **establish a competent barani** planning cell to build upon the work completed **for the Master Plan.**Planning requires data, trained human resources, computerization, and a willingness to apply development strategy to the opportunities of barani zones. The Master Plan has begun building the data base and providing a framework for this analysis of barani development. This work should be carried forward, modified through experience, and improved to reflect changes in each barani zone. ABAD, correctly staffed and authorized, could serve this function.

6. Provide ABAD with the **staffing** and funding to establish a competent information and public relations cell that can provide dissemination to the public of the impact of barani development initiatives.

Today, ABAD has neither the charter nor, as a consequence, the staff or funding to make a major contribution to barani development. Within the current institutional framework, either the responsibilities and expectations for ABAD should be downgraded to a provincial-level agency whose activities are limited to providing valuable technical, vocational, and paraveterinarian training while executing donor-funded multisectoral projects, or ABAD should be restructured and provided with the authority and resources to do the job intended by the Barani Commission.

Restructuring the institutional framework in which barani development takes place is a second option, and in the recommendation of the Master Plan; it is considered in the following section.

DEVELOPMENT OF THE BARANI TRACT: INSTITUTIONAL REQUIREMENTS

Introduction and Summary

This section builds upon the previous analysis of Zonal Development Authorities and ABAD, as an example of the Agency model for the organization of barani development. It compares these institutions with the strategy and recommendations of the Master Plan and suggests the most appropriate and useful institutional framework for the development of the barani tract.

The requirement for barani-wide planning, policy coordination, and evaluation,results in a recommendation for an Attached Bureau to the Planning and Development Department to oversee barani development. The requirement for execution, field coordination, and implementation of barani zone development opportunities results in a recommendation for Zonal Development Authorities to generate increased productivity and income.

Using the framework of the Master Plan, recommendations are provided for revisions in the responsibilities of existing institutions:ABAD Development and Zonal Development Authorities. The following table summarizes the institutional framework presented in the next section:

TABLE II-2
INSTITUTIONAL ARRANGEMENTS FOR BARANI DEVELOPMENT

Requirements	Institutions
Provincial Policy Secretariat	Barani Development Board, Chief Minister and Chairman of Planning Board, Secretaries, Zonal Development Authority heads and elected representatives
Province-wide Planning, Coordination,and Evaluation Body for Barani Development	Barani Development Bureau Attached to Planning and Development, Lahore
Zonal Coordination, Execution,Finance	Zona1 Area Development Administration and Authorities
Multisectoral Project Management Implementation	Project Management Units (at the Zonal Level), Lead Line Departments

Diversity and Uniqueness in the Barani Zones

Seven zones identified by the Barani Commission are physiographically and agriculturally distinct and separate regions of the Punjab.4i Conditions are so diverse and development solutions so location specific that planning and implementation for development should be considered within zonal boundaries. In spite of common program elements, constraints to development vary so much that new technology and social and community organization must be crafted to the specific requirements of each zone. The Master Plan identified no obvious programs or projects that cut across or spanned individual barani regions.

The problems to be resolved call for integrated actions across line departments, using the full assistance of the government's administrative apparatus and the support of elected bodies at each jurisdictional level. Water development has not proven effective without farm-level water conveyance structures and agricultural and marketing assistance. Range improvement is only possible when animals are managed to match available fodder supplies. New cropping technology depends upon inputs not owned by individual small farmers and calls for group or producer association responses. The problems to be addressed need multisectoral solutions, programs that require cooperation and coordination across many different departments and agencies.

Because of these special requirements, barani projects must be area based and integrated with functional departments as well as with district,tehsil, markaz, and union council programs and representatives.

The barani tract consists of seven internally contiguous areas, if Cholistan is included and one special area in the Riverain lands. Of the seven zones, two (the Salt Range and Potwar Plateau) are joined across seven districts making the implementation of projects based at district levels difficult to distinguish or separate.Institutionally, the Plan recommends merging the Salt Range and the Potwar Plateau into one zone, to be administered and supported by the same organizational entity.

41Although Cholistan was not included in the Barani Commission Report, or in the Master Plan data base (since the existing Development Authorities were excluded from the terms of reference), the Cholistan Development Authority is logically included within the institutional framework proposed for the seven barani zones, making eight zones considered in this section.Of the eight, five are candidates for Zonal Development Authorities: Cholistan and Murree-Kahuta (already operating), D.G. Khan (created in January 1988), Potwar (announced to be formed in February 1988), and Thal. The Salt Range has no easily identifiable and separate administrative demarcation and might best be included in the Potwar Development Authority's jurisdiction. Siwalik does not have disadvantages that require a Development Authority, and the Riverain lands are better served through the umbrella of the Department of Agriculture.

42The line departments and their subordinate offices most directly connected with increased agricultural sector performance are agriculture extension,agricultural research, agricultural engineering and soil conservation, cooperatives,irrigation, communications and works, and local government and rural development.

Institutional Requirements in Support of **Barani Development**

To support barani development effectively, it is necessary to have appropriate centers of planning and oversight, implementation, and coordination among several levels of government. These include:

Provincial level (policy guidance, planning, policy coordination, and evaluation);

· Zonal level (coordination,project execution, and administration); and

· Project level (project implementation).

The institutions and their responsibilities are presented below.

Provincial **Level(for Punjab Province)**

The provincial level sets policies that promote barani development. Policy considerations might include the allocation of public investment funds between barani and nonbarani development initiatives or considerations of locational subsidies, special tax incentives, or credit lines.These policies are provided by the Barani Development Board, headed by the Chief Minister, substituting for the PDWP for all barani planning and projects.

Barani-wide (for the Barani **Tract)**

At the provincial level, an institution with responsibilities for the barani tract must engage in planning to identify and rank alternative investment possibilities.These opportunities could include line department or zonal authority projects within one zone, or investments between zones, competing for positions within the ADP.

Priorities should be set by an extension and continuation of the process of master planning, which after analyzing the resource base and existing production systems within each barani zone, categorizes its development potential. The development potential within each barani zone should be screened and assembled into an overall zonal development strategy for the long term and present the current five-year plan. From the continually modified plan, projects are identified each year for public investment.43

This planning system has been initiated by the Master Plan, which provides a compilation of information, a data base on resources and production systems, and an approach to defining development opportunities leading to the generation of project possibilities. A barani-wide institution at the provincial level should be capable of continuing and extending this initiative to take account of changes that will occur.Of special interest is the regular improvement of the information on barani zones,

43To be combined with locally identified barani development projects brought forward by Zonal Development Authorities under Investigation and Survey Grants.

much dependent upon coordination with the Bureau of Statistics, which can select barani tehsils for data aggregation from field surveys.

The same institution should provide policy coordination for multisectoral projects to ensure high-level cooperation among affected departments and administrative and elected bodies.44 It should also review and provide to senior staff of the Planning and Development Department assessments of all line department projects proposed for the barani zones. This will help ensure that sectoral projects are complementary to one another and to the main multisectoral activities under way in each barani zone.

An important component of the planning cycle is evaluation feedback of the impact of approaches taken within barani multisectoral projects, leading to improved projects for the next cycle of investment. The provincial barani development institution should arrange for comprehensive evaluations of each main development initiative, seeking insights and lessons to be applied elsewhere in barani areas.

Planning, policy coordination, and evaluation feedback require the barani institution to interact with the provincial headquarters of line departments, utilizing their specialized and technical manpower and support, and with the senior staff and sectoral offices of Planning and Development. Therefore, the Master Plan recommends the creation of an Attached Barani Development Bureau to the Planning and Development Department, based in Lahore, with specific responsibilities for barani-wide planning, policy coordination, and evaluation.

Within Zones **(for each Barani Zone)**

Each of five barani areas (as defined above) requires an organization to be responsible for the development of that region. There are two prime reasons for the establishment of a zonal organization: (1) to ensure smooth execution and field coordination of multisectoral projects that span multiple department responsibilities;45and (2) to allow coordination and reinforcement of all sectoral line department and agency programs operating within the barani zone. Satisfaction of these two objectives requires field-level management oversight and the cooperation of staff of line departments and administrative and elected bodies.

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44 The Barani Development Institution could serve as the Secretariat of the Barani Development Board,chaired by the Chief Minister.

45 There are other reasons for the creation of Area Development Authorities, which are promoted by elected leadership on the basis of a need for special attention to a disadvantaged region. Existing Area Development Authorities have added one additional funding source to those agencies or offices that respond to small infrastructure, social, or educational funding requests. These Authorities could become channels for introducing locally identified barani development projects into planning and funding cycles.

A barani zonal organization will also provide administrative and financial support to PMUs. It should monitor multisectoral development projects to allow midterm correction and ensure that support and field management are accomplishing project objectives.

Therefore, the Master Plan recommends the formation of the Zonal Development Authority most recently announced (Potwar) into an umbrella organization that can execute, oversee, and support barani multisectoral production and income-generating projects, while coordinating all development initiatives within the zone. Once the organizational patterns have been tested and improved, the model can be extended to the other existing Development Authorities.

Within Zones (for each Multisectoral Project)

There is a need for field management and implementation (contracting, hiring staff, reporting, and financial management) of individual multisectoral development projects to achieve the highest return from public investment. These functions are normally carried out in multisectoral projects by PMUs or Lead Line Agencies.

There is potential confusion over the concepts of oversight, execution,implementation, and management of projects. In the Master Plan, the Zonal Development Authority will oversee. barani multisectoral projects, serving as the executing agency. This is the umbrella function that includes operational direction to the PMU, field coordination with line departments and elected bodies, and administrative and financial support. The Zonal Authority serves as the Secretariat for and chairs the Project Coordinating Committee. The Project Manager heads the PMU and conducts the daily activities of the project, accepting guidance from and reporting to the Zonal Authority. In this sense, the PMU implements the project,with contracting, hiring, and dispatching staff and project resources under its control.

The Master Plan recommends continuation of the established policy of using PMUs or lead line agencies to provide field implementation for multisectoral projects,to report to and to be supported by the Zonal Authority, and to serve as the Chair and the Secretariat of the Project Coordinating Committee.

Responsibilities of the Institutions for Barani Development

Barani Development Board

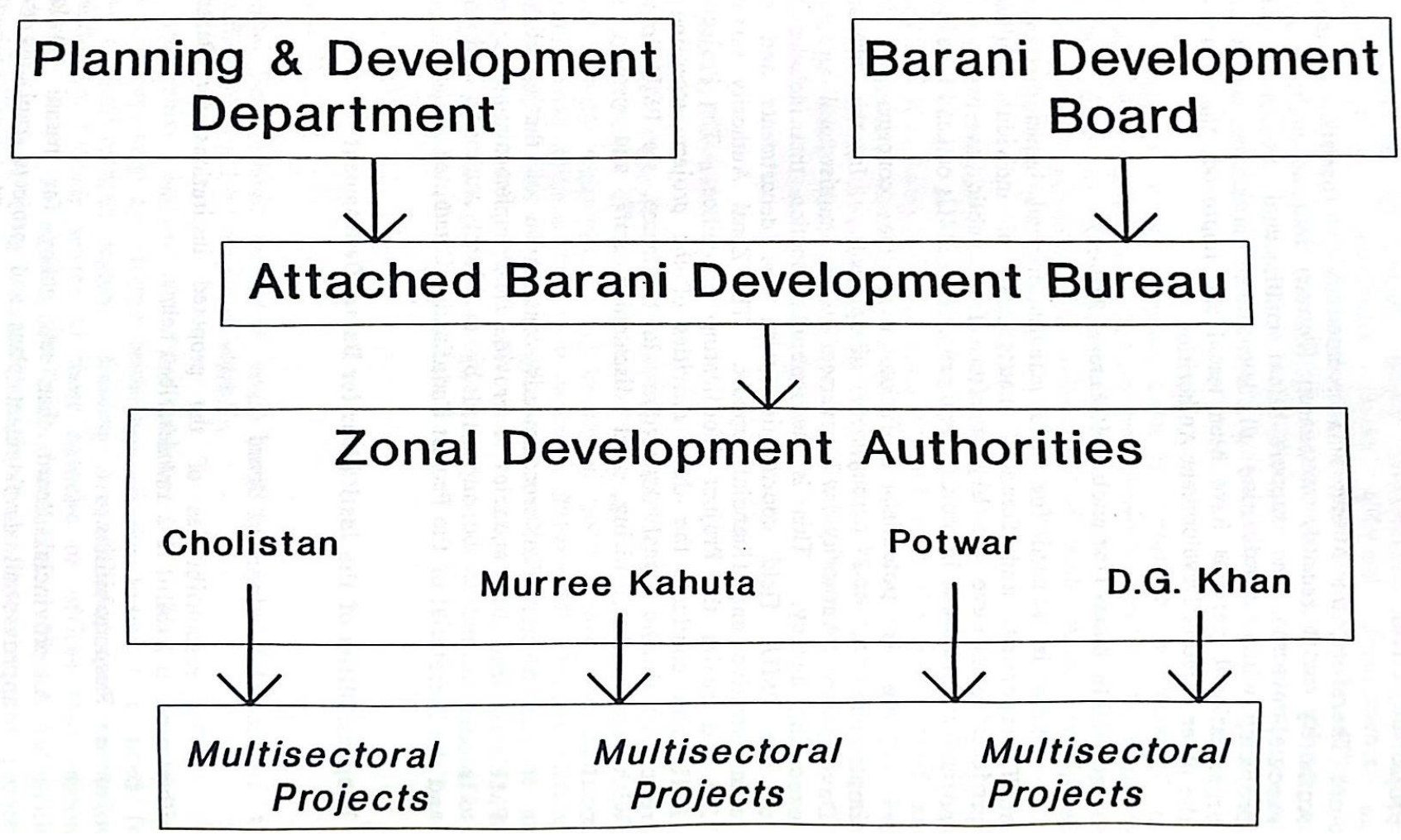
The responsibilities of the proposed institutions for Barani Development are illustrated in Exhibit II-2 and described below.

Responsibilities:

A provincial Board that sets policy for barani development reviews and approves all development plans and projects, replacing the PDWP for barani zones. The Chief Minister serves as Chairman, with the Deputy-Chairman designated as the Chairman of the Planning Board. Line department Exhibit

EXHIBIT II-2

PROPOSED INSTITUTIONAL ARRANGEMENTS FOR BARANI AREAS



Secretaries, Zonal **Authority** heads, and elected representatives complete the Board's **membership. The** Barani Development Bureau serves as the **Secretariat to the Barani Development Board.**

Attached Barani Development Bureau

· Planning responsibilities:

-- Maintain and improve data on barani resources and production systems;work directly with the Bureau of Statistics to improve barani information reporting;

-- Improve upon the Master Plan's data base and strategy for each barani zone in conjunction with the Zonal Development Authority; add to the data base new findings from proposed special studies on water resources,rainfed agriculture potential, livestock production, and aggregation of barani production systems not available to the Master Planning Team;

Identify opportunities for investment from the development potential of each barani zone; prepare a development plan covering 20 years with a 5-year action program for each zone (drawing upon and improving the Master Plan);

Shape development potential into projects, prepare PC-1s with the assistance of the Zonal Development Authority; provide a central location for all donor funding for multisectoral projects in barani areas;and

-- Review all line department and Zonal Development Authority projects proposed for barani zones and provide priorities and recommendations for inputs into Annual Development Plans and Five-Year plans.

Coordination responsibilities:

-- Serve as the Secretariat of the Barani Development Board for policy and priorities for barani areas development; in this capacity, review all line department and Zonal Development Authority programs and projects for barani areas, with recommendations on the division of sectoral and multisectoral investments by zone;

Serve as the Secretariat of the Planning and Development Department for interaction with the Zonal Area Development Authorities; in this capacity, work directly with the Zonal Development Authorities to ensure that multisectoral projects and line department sectoral projects are designed and implemented to achieve complementary objectives;and

Serve as the Secretariat for the Committee overseeing each major multisectoral project; coordinate with the line departments to ensure necessary cooperation in multisectoral projects.

· Evaluation responsibilities:

-- Assess development strategies yearly for the Zonal Development Authorities, taking into account new technology, markets, skills, economic factors, and national and provincial priorities;

-- Assess the impact of individual major development strategies and projects of the Zonal Development Authorities, seeking knowledge that will improve planning for the next cycle of barani investmnent;and

-- Coordinate with and fund the Punjab Economic Research Institute to provide field surveys of the benefits of multisectoral projects, feeding back results of the analysis into the next cycle of barani projects.

Zonal Area Development Authorities

· Coordination responsibilities:

-- Serve as the coordination point for line departments, agencies, or elected representatives' involvement in specific barani development initiatives,including identifying potential projects, planning, field investigation,ongoing activities;and

Serve as the Secretariat to the Project Coordinating Committee to ensure operational coordination of field agencies involved in multisectoral barani development projects.

Multisectoral project execution responsibilities:

-- Serve as the executing agency (umbrella organization) for all multisectoral barani development projects;

-- Provide operational guidance to the PMUs or Lead Line Agencies as the Secretariat of the Project Coordinating Committee on the proper management of multisectoral projects; and

-- Provide administrative and financial support to PMUs and Lead Line Agencies in implementing multisectoral projects.

· Monitoring responsibilities:

-- Monitor ongoing progress of multisectoral projects to allow mid-course correction.

Relating Existing Institutions to those Proposed for Barani Development

Barani Development BureauAttached to the Planning and Development Department

The responsibilities noted above are divided between the Regional Development Section of Planning and Development Department in Lahore and ABAD in Rawalpindi.At present, neither the designated sections in Planning and Development nor ABAD is staffed or charged to continue the Master Planning effort. The Attached Bureau can draw upon the technical resources of other sections within Planning and Development and the line department secretariats in Lahore. This should reduce the number of dedicated positions required. With this assistance, the Bureau might be staffed with experts on planning, economics, engineering, data analysis, and area development,perhaps a cadre of six professionals with administrative assistants.

Most of these functions cannot be undertaken at present by ABAD. The Attached Bureau should be supported with an equipped library (begun from the resources of ABAD and the collection assembled by the Master Planning Team) and two to four hard disk computers, which the professional staff are trained to use, for report writing, monitoring of ongoing projects, and data analysis for zonal development. Specialized training in regional planning is available from international donor agencies, and a small technical assistance and training grant has been suggested (see the following project proposal) in the Master Plan to help establish the Barani Development Bureau under the Action Program.

An Attached Barani Development Bureau could be formed from a professional cadre within ABAD and relocated to Lahore to ensure coordination with Planning and Development Department and the line department secretariats. It would concentrate on the planning, policy coordination, and evaluation functions proposed for this organization.

Alternatively, an Attached Bureau could be formed by adding to resources within the Planning and Development Department, and ABAD could be transformed into the major Zonal Development Authority.

The Master Planning Team recommends that the Attached Bureau be formed from additions to Planning and Development resources, since planning, policy coordination, and evaluation are new skills to the majority of ABAD staff. ABAD personnel are operationally oriented, making them better suited to work in the major Zonal Development Authority for the Potwar Plateau (and perhaps eventually the Salt Range barani zone). A grant project to provide institutional strengthening for the Bureau is included in the five-year action plan.

Establishing Zonal Development Authorites

Two Development Authorities are operating: D.G. Khan has been created, and the Potwar has been announced. Only Thal remains to be created and the Salt Range to be integrated into the Potwar Zone. Siwalik is not considered by the Master Planning Team to be sufficiently disadvantaged to require a special Development Authority.

The Potwar Integrated Agricultural Development Project, currently under feasibility study, presents an opportunity to determine how to establish a Zonal Development Authority concept for rapid production increases through the implementation of a major multisectoral project. In addition, with minor modifications to existing plans, the Murree-Kahuta Development Authority could have a productivity-oriented multisectoral project ready for implementation, which could also test the efficacy of the program proposed by the Master Plan. Should these tests prove effective, the Salt Range could be added to the responsibilities of the Potwar Development Authority since the zones are contiguous and overlap district boundaries. The staffing, operational procedures, and support needed to transform the existing Development Authorities into a concentration on income-generating multisectoral projects could be provided in subsequent years.

The Riverain Zone is not contiguous and represents a special opportunity that should soon be exploited under the Riverain Development Project now being prepared for appraisal by the Asian Development Bank. The Riverain areas do not lend themselves to one area Authority, and development is better managed by some arm of the Department of Agriculture.

When the model for Zonal Development Authorities has been established, the Attached Barani Development Bureau will work with the Development Authorities to generate zonal strategies and plans to increase production and income through coordinated intersectoral projects. These projects, designed by the Attached Barani Development Bureau with the assistance of the Development Authority staff and relevant line departments and agencies in each zone, will be reviewed and sanctioned through the regular Planning and Development process. If necessary -- that is, if the current programs and activities are deemed to be insufficient -- social,vocational training, education, and welfare projects could be undertaken from the Zonal Development Authorities block grant funds.46

The Zonal Authorities could be funded for a core staff of four to eight,depending upon the size and complexity of the barani zone or zones. This staff would need to have expertise in project management, monitoring, administration and finance, economics, and engineering. Additional staff would be justified within specific development projects or within the block grant portion of the Zonal Authorities activities. This could include continuation of the vocational training for barani rural workers, initiated by ABAD.

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46 Earlier sections of this chapter recommended against the involvement of Development Authorities in small self-help activities that provide social services and infrastructure. This is not to place reduced importance on this aspect of the provision of government services, but to acknowledge that there are ongoing programs whose objectives are to improve social aspects, education, and welfare of the barani's citizens. Development Authorities can assist in making these programs more efficient. When the Authorities turn their attention to doing the job themselves, it detracts from more important concerns for overall coordination of barani development, and the execution of multisectoral projects.

Relating the Agency for Barani Areas Development to the Institutions for Barani **Development**

The proposed Attached Barani Development Bureau extends and expands the scope of the Planning and Development Department to undertake what ABAD might have done in a strategic planning, policy coordination, and evaluation capacity with feedback into the next budgeting cycle. The vagueness of ABAD's charter and the very limited control over actions of line departments led ABAD into direct implementation of vocational training or donor-funded multisectoral programs at the expense of planning, monitoring, and coordination of other departments' sectoral programs. The need for this province-wide barani planning and policy coordination capacity still exists, especially now that the Master Plan has initiated a strategy of zonal development.

ABAD filled an institutional need that is required, providing an umbrella organization designed to promote, direct, administer, and coordinate multisectoral projects in complex physiographic environments. But the organizational position of ABAD at a provincial level is inappropriate for project execution.

Province-wide,executing organizations generate province-wide projects.Provincial-level management bypasses district administrative structures and associated elected bodies and directs projects from one central point. As an executing agency,ABAD generates multisectoral projects that it will manage and control. This is not sufficient for complex multisectoral projects in widely diverse barani zones. Such projects require a Development Authority that can effectively bring together the line departments and local leadership to focus energies and resources to bring rapid change to rural areas.47

One result of a provincial organization designing and planning multisectoral projects is ABAD's Integrated Land and Water Resources Development Project.However worthy the project components and important the development needs,when assembled under ABAD this seven-district, three-technology intervention is not viewed by the Master Planning Team as being implementable.48The lines of control leading back to ABAD have no supporting administrative structure.District line department leadership, the hierarchy of district and tehsil administration, and the mobilization of resources by elected bodies are generally bypassed or incorporated only at the Project Coordination Committee level. The span of control over vastly different approaches and implementing agencies is too broad to be managed from one institution.

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47 · The analysis of ABAD's Integrated Land and Water Resources Development Project concludes that the project as designed, to be executed by a provincial-level agency, is unmanageable. What is required for project execution, coordination, and implementation is an organization that can mobilize the local administrative and elected structures in support of multisectoral development. These organizations should be the Development Authorities within the barani zones.

48 We believe this judgment will also be rendered by the Asian Development Bank, which will find the project not acceptable for funding. As requested by the Steering Committee, the Master Planning Team has provided a separate detailed analysis of the project.

This project is the result of a provincial organization seeking to execute what should be a Zonal Authority project. Instead of being centered at the field level,where line departments are coordinated in daily activities, the project becomes centered at ABAD, which would chair the Project Coordinating Committee across several different barani zones.

To realign the existing institutions with the institutional requirements of barani development, ABAD should be designated as the Zonal Development Authority for the Potwar -- and later the Salt Range if the first test is successful -- the largest single combined barani zones in both area and population. This would call for the elimination of ABAD's Mini Dams Feasibility (engineering) Section and the Publications (Information) Cell, and movement of the library and librarian to the Attached Barani Development Bureau in Lahore. Technical and vocational training activities could be continued under block grant arrangements. With appropriate downscaling to fit the requirements of the largest and most complex Zonal Development Authority, ABAD is well located and experienced to undertake the responsibilities listed above.

CONCLUSIONS

Within the last decade, the Punjab government has experimented with institutional solutions to barani development, utilizing two mutually exclusive forms:Development Authorities and an Agency (ABAD).49 The Master Plan provides a framework that can be used to select institutions to promote barani development, the first placed at the provincial level -- the proposed Barani Development Bureau attached to the Planning and Development Department -- to oversee and assist the second -- Area Development Authorities operating in major barani zones.

The Master Plan sets forth fundamentally different responsibilities for provincial and zonal institutions engaged in barani development. Provincial-level institutions provide policy guidance and strategic planning, and coordinate and evaluate the results of prior planning decisions. Zonal Authorities execute and provide field coordination for all barani development, with special attention to directing and overseeing multisectoral project implementation. The existing institutions are judged to provide little or no strategic planning, and the provincial-level barani agency (ABAD) is engaged primarily in implementation of training and two donor-funded multisectoral projects.

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49 Previously, when a Development Authority was created, ABAD ended its responsibility for the zone. Thus ABAD has no responsibility for the Cholistan or Murree Kahuta Development Authorities. Each Development Authority is a separate case, however, and ABAD has not been restricted from operating within the Development Authority for D.G. Khan. Assuming the Authorities will be given exclusive charter to operate within their boundaries, the formation of the Development Authority announced for the Potwar will practically eliminate ABAD,unless rechartered and repositioned, from barani activities.

The Master Plan recommends the revitalization of a Barani Development Board replacing the PDWP as the policy-setting, project review, and approval authority for all barani development initiatives. The Chief Minister would head this Board, and the Chairman of the Planning Board would serve as deputy Chairman. Line Department Secretaries, heads of Zonal Development Authorities, and elected representatives would serve as members. The Barani Development Bureau would serve as the Secretariat of the Board. In addition, an Attached Barani Development Bureau based in Lahore would assume the increasingly demanding planning, policy coordination, and evaluation functions required for overall barani tract development.Further, the Master Plan recommends that barani multisectoral projects, while being planned and designed from a provincial vantage point, be executed by Zonal Development Authorities, which are given coordination authority over all barani development activities.

The Master Plan further recommends the re-formation of two most recently created or announced Zonal Development Authorities and, when pilot activities in the Potwar Development Authority improve the model, the reconfiguring of existing Development Authorities into coordinating and executing institutions for each barani zone. In this role they will ensure that all line department and agency activities in barani development are complementary and provide the umbrella for the execution of multisectoral development projects. Rather than making all changes at once, a more judicious plan is to use the future Potwar Development Authority to establish the staffing,funding, charter, and operational procedures required for successful barani development, and then transfer this knowledge to the other Zonal Development Authorities through the Attached Bureau of Planning and Development Department.

Zonal Development Authorities

Barani Zonal Development Authorities have had limited success in generating increased production and income to cover their costs and in coordinating the work of the line departments to increase the efficiency and impact of barani development.Without a strategic development plan for the zone, the Authorities respond to local demands for services. Although important, few social or education services provide the immediate basis for increased agricultural output or other income-generating production. This weakens the resolve, especially in times of budget crisis, to continue funding what are nonproductive block grants.

Using the professional capacity of the Attached Barani Development Bureau, the Zonal Authorities can be provided a strategic plan for the mobilization of development opportunities unique to each zone. The Attached Bureau, working with the core Zonal Authority staff, can prepare multisectoral projects that overcome the constraints to increased agricultural production. These projects will pass through the same screening and sanctioning procedures as other projects proposed for the ADP,while the Zonal Authorities use block grant funds for small service or training endeavors. The Zonal Authority core staff could then concentrate on the execution,coordination, and management necessary to make the complex, integrated, and cross-departmental projects successful.

Transforming the Agency for Barani Areas Development

ABAD should be transformed from a province-wide execution agency with its own special projects into the Zonal Development Authority for the largest and potentially most productive combined barani areas: initially, the Potwar and later incorporating the Salt Range zones. ABAD's past experience in organizing large donor-funded projects, chairing project coordination committees, administering staff,and reviewing monitoring reports will be important in launching the field operations of a Development Authority. ABAD's location in Rawalpindi, a liability for province-wide planning and coordination, is an asset for project execution in the contiguous zones of Potwar and the Salt Range. The transformation should be rapid, with ABAD being ready to serve as the executing agency for the major Potwar Integrated Agricultural Development Project now under feasibility study for the Asian Development Bank.

The Next Steps

Everything cannot be done at once. Major institutional revisions call for beginning with a structure, testing its efficacy, and reworking the model as experience provides lessons for future modification. In this instance, the announcement of the Potwar Development Authority and the feasibility study for the Potwar Integrated Agricultural Development Project present a unique opportunity.The Development Authority can be shaped to implement a large project covering three districts of the Division, with a requirement for coordination among the important nation-building departments at the division, district, tehsil, markaz, and union council levels.

Rather than proposing one model or structure for Development Authorities, the Master Plan suggests beginning with the Potwar Development Authority, proposing staff positions, responsibility, and support as necessary to accomplish the objectives of the new project. In effect, the Master Plan suggests using the existence of the project to help define the relationships of the Authority to the government's administrative and elected structure, as well as to the demands of project implementation. To assist in this work, the Feasibility Study for the Potwar Integrated Agricultural Development Project will provide a suggested institutional structure, encompassing both the project and the oversight Authority. This proposed framework might be useful in considering the next steps in the restructuring of the institutional relationships critical to barani development.

REGIONAL PLANNING SUPPORT PROJECT FOR THE BARANI TRACT

Background and Project Setting

Since the mid-1970s and the work of the Barani Commission, the federal government and the government of Punjab Province have expressed interest in directing resources toward barani agriculture. Currently, there are specialized authorities, agencies, research institutes, and projects focused upon the problems and

development opportunities of this large but lagging agricultural sector. There is the prospect of additional resources, both government and donor provided, being committed to the development of barani zones in the Punjab.

The issue of how most effectively to plan, program, and administer a concerted effort of barani development in Punjab Province remains unresolved. The Barani Commission, in its 1976 report, saw that organizational difficulties were a critical component in implementing the "colossal development activity" that would be required in the barani tract. A complex and extraordinary effort was required to develop a large, heterogeneous area that crossed over administrative boundaries and required site-specific, integrated interventions. This work would have to include different approaches to otherwise routine nation-building activities such as data collection and processing, research, policy planning, project design, and coordination of different departments and agencies, project implementation, supervision, monitoring, and evaluation. The Commission noted that nothing short of a permanent organization with considerable powers and expertise was needed.

The organizational structure that was established in 1979, ABAD,was charged to carry out a most complex and difficult task. All who have examined the accomplishments achieved under this form of organization, including ABAD itself,agree that the means for articulating an integrated development strategy for the barani areas and making decisions in a way that would lead to the implementation of such a strategy are not yet in place. In response to a need for special attention to specific zones, four Development Authorities have been created or announced to oversee barani programs in Cholistan, Murree-Kahuta, D.G. Khan, and Potwar.

Objective and Rationale for the Proposed Project

The objective of the project is to support the government's decisions to undertake a focused regional planning and development administration approach to the barani areas of Punjab. Given the difficulties associated with the development of lagging regions or sectors within a country, the effort will require a level and intensity of support not usually afforded national-building efforts.

The Master Plan for Barani Area Development has been formulated as a first step toward conceiving a strategy for development of the barani tract. Based upon a supporting study conducted by the Master Planning Team, the plan formulation process has provided its own diagnosis and discussion of alternatives that might be considered by the government for implementing the 20-year plan and for the 5-year action component of the plan. Of equal if not greater importance is the management of the plan to ensure not only that the 5-year program is indeed executed, but that the 20-year plan, over which time much of the planned change is to occur, will be revised and updated as new knowledge is gained. This will require a system for monitoring specific projects and conditions in the barani tract; evaluating and incorporating lessons learned into new initiatives; and periodically reassessing assumptions, the objectives, plans, and budgets to reflect new understanding about the barani condition.

The Master Plan has attempted to confront the many technical, methodological,conceptual, and practical problems associated with a deliberate government-initiated program of influencing and guiding the development of the barani tract. The

answers that have been provided to these issues are, like the problems of development themselves, not of the quick-fix variety. They require an innovative,continuous, flexible, and responsive process whereby objectives are set, actions initiated, and results evaluated for future consideration. The plan calls for an institutional environment that will help ensure its success.

The Master Plan has recommended an organizational structure that places planning, policy coordination, and evaluation with feedback into future year's budget cycles in an Attached Bureau to the Planning and Development Department, located in Lahore. The Regional Planning Support Project is designed to improve the institutional capability of this new organization and provide specialized training for the staff and limited technical assistance, in continuing the planning process begun by the Master Plan initiative.

Project Scope and **Components**

The project will provide professional training, applied research,material and equipment, and technical assistance support to strengthen an Attached Bureau of the Planning and Development Department, Lahore, charged with the planning and administration of a development program for barani areas. At the provincial headquarters where policy planning, project design and authorization, and evaluation take place, the Regional Planning Support Project will provide:

Technical assistance in programming and management of planning resources;

· Training in appropriate methods and techniques for data management,interpretation, and presentation; multisectoral project identification, design,and appraisal; plan monitoring and updating; use of development indicators and measures in plan formulation and evaluation; and use of spatial analysis in development decision making;

Computer equipment and facilities to allow plan formulation and updating,monitoring of barani programs, and evaluation of development impact through tehsil-level statistics; and

Building and updating a data base on the barani's natural resources existing production systems and development opportunities.

Training will be provided both on the job, by short courses organized locally, and internationally, by training centers such as the United Nations Center for Regional Development in Nagoya, Japan, as well as specialized training available from several British and American universities.

For the staff of the Attached Bureau and the staff of Zonal Development Authorities, the Regional Planning Support Project will provide the following services:

· Overseeing the formulation of plans for zonal or district development;

Proposing alternative methods that are available for carrying out multidisciplinary and cross departmental development activities, including how to relate and work with the administrative machinery of the government and the local elected leadership;

Training and assistance in monitoring and evaluating development projects;and

Capturing and recalling a computer-assisted information base to assist in zonal coordination and planning.

The project will engage in an applied research program to identify the most appropriate means to carry out those activities within the barani context and provide the technical assistance and training to extend these findings to Development Authorities in barani zones.

The project would be executed by the Planning and Development Department,which would contract for specialists with experience in institution-building activities in planning and development management, to acquire international expertise in regional and project planning, management, and institutional behavior. To supplement this core team, local university departments and faculty will be chosen to assist with applied research on organizational and management issues associated with an integrated development approach and with organizing a series of short courses and training exercises. Material support will be determined based upon need. However it is expected that the equipment, vehicles, operating expenses, training, and valuable data base and documentation assembled in support of the Barani Master Plan Project would provide support for a continuation of that planning project.

Project **Costs** and **Financing Arrangements**

The project is intended to last three years. Total cost is estimated at $1million, which would be financed from a donor agency grant. The grant would cover domestic and international training, a small technical assistance contract (perhaps 24months of specialized short-term assistance over the course of three years), computer capacity, office facilities and furniture, vehicles and transportation, and allowances.

Implementation Arrangements

The project would be executed by the Planning and Development Department,Punjab Province.

Matching Regional Objectives to the Project

Productivity: A regional planning capacity can pay high dividends by increasing the efficiency and efficacy of the public investment in barani areas. With millions of rupees going into barani development, even a small increase in the impact of development funds in the ADP will pay for the investment in staff and training of the Attached Barani Development Bureau.

Equity: An improved planning effort, with clearly stated criteria for project selection, can improve the equity of barani development programs by ensuring access by small farm units to new agricultural technologies.

Sustainability: The Barani Development Bureau, working with the Zonal Development Authorities, can specify project criteria that make positive incentives for private sector involvement and reduce, as much as possible,recurrent costs resulting from public investments. Without these criteria,standard line department projects tend to call for additional government services, and such things as more drill rigs, tractors, and bulldozers. What is needed for sustainability is a perspective that considers how the private sector can be involved in development. This is one role to be encouraged by the Regional Planning Support Project.

Conservation: A long-term planning perspective will help devote resources to conservation. The generation of a plan for each barani zone should include conservation objectives that maintain or improve the natural resource base.The Regional Planning Support Project will treat the environment as one important component of each zonal plan.

ANNEX

DEVELOPMENT PLANNING IN THE PUNJAB

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DEVELOPMENT PLANNING IN THE PUNJAB

General Administrative System

With some minor variations, each province of Pakistan conforms to a well-established system of administration, which is based on acceptance of the district as its basic unit and its most important single element. Historically the district was designed as a convenient and practical unit for levy and collection of revenue. The roots of the concept can be traced back through many centuries, but the British refined and installed it as the basis of their administrative structure.

When setting the boundaries of districts for effective and efficient governance,they considered not only the size of the area and the homogeneity of its population but many other diverse factors -- geophysical, ethnic, social, and historical. These considerations proved invaluable at a later date when the activities of government expanded from mere revenue collection and law and order and moved into fields of general welfare and development. It was then realized that this administrative structure, which had been basically designed only for collection of revenue and administration of law, contained within it the basic strength and versatility to adapt itself to requirements of development, to representative government, and to enhanced coverage by welfare institutions and systems.

In time, with an increase in population and in their awareness, the need for certain changes became inevitable. The basic unit, the district, had to be subdivided into smaller constituent elements called tehsils and subdivisions. The districts also had to be vertically rearranged into "divisions" to handle better the complexity of administration and increased flow of work between the province and its multiple local administrative units.Eventually, such population pressures would lead to the breaking up of larger, more heavily populated districts into two or three separate,independent units

Development Planning System

Departments were created, staffed, and financed for the development and welfare responsibilities of the government. Each department had its clearly defined charter of responsibility which was, and continues to be, laid down in formal terms in the government's Rules of Business.1 As areas of government interest and intervention expanded, the departments proliferated. Each department comprised two separate elements, namely, the policy-making element, under a Secretary lodged at the provincial headquarters, and an executive element, which spread out into the field and carried out policy decisions. The arrangement was in harmony with the general administrative framework as it abided by and took care not to offend the traditional units of governance which had been in place for decades and had developed considerable inertia. Indeed, the strength of administrative systems

1 Rules of Business, Services and General Administration, The Punjab Government,1974.

remains undiminished to this day. All participatory systems, electoral as well as nonelectoral, were adjusted to synthesize the administrative units.

As population continued to expand, strains and stresses on the administration led to expansion and of departments. However, the nature of problems generated by the community and measures required for their resolution rapidly became more and more complicated. The traditional departments attempted to cope with the task by moving toward greater specialization. It soon became clear that, however able and willing the departments were, they could not and never would be able to provide adequate responses to all contingencies. There existed certain circumstances related to a particular area or a activity on a problem where a special one of a kind arrangement had to be devised if the response were to be effective and meaningful.Thus, variations of traditional organs of administration developed in the form of Authorities,Agencies,Corporations, Boards, and similar arrangements.

To understand the system of planning and development in the province of Punjab, it needs to be related institutionally to administrative structure and elective structure; functionally to departments, local bodies, and nonformal organizations; and financially to generation of funds, the flow of funds, and expenditure of funds. A summary of the development, the elective, and administrative institutional structure is presented in the two diagrammatic presentations that follow: Exhibit A-1illustrates the outlines of this system.Exhibit A-2 explains the staffing arrangements for the main development departments which reflect the variations in the nomenclature between one department and another.

The local councils referred to in Exhibit A-1 are being administered under Punjab Local Government Ordinance of 1979. In addition to the Zilla Councils providing elective representation at the district level and the Union Councils at a subdistrict level, three categories of urban councils, namely, Town Councils,Municipal Committees, and Municipal Corporations have also been created under that ordinance. Urban areas with a population of 10 to 30,000 have been constituted into Town Committees, those between 30,000 and 500,000 into Municipal Councils, and those above 500,000 into Municipal Corporations. There are a total of 133 Town Committees,63 Municipal Committees and 8 Municipal Corporations in the province.

The financing at these local levels of government is derived from:

The levy of local taxes, which each tier of council is able to collect from a small defined tax base;

Transfers from government for specific activities under matching grant schemes (routed through the Local Government and Rural Development Department);

Transfers from the next higher tier of the local government;and

Grants-in-aid from provincial government in form of subventions (routed through the Local Government and Rural Development Department).

Exhibit A-1

Zlective, Adminictrative and Develozmental Structures

Level	Ceneral Adminiatrative	Planning and Develorment	Elccbive	Lfre Departrentet
Province	Chief Secretary	Provincial Development Horking Party/Chairman, Planning and Develcgment Board	Provincial accembly of minicterz	Secretary (DCSC)
Divizicn (8 in rumber)	Commiaeicner	Divisicnal Develczment WorkIng Party		The Departaental Development sutcommittes is located aithin the administrative departnente.
Dlateicte (23 in nmber)	Depaty Conmizeicxer	Disteict Develcyment Committes	Z1la Comc11	The eecretary of the derartsent ccncerred chairs the oitccmmitte ard 1te cther semters are a representative of the flnance← g
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* Detaile kkon eeporately in dlzgrmm 2.

Exhibit A-2

Structure of Nation Building Departments, Punjab Province

Level	ENGINEERING DEPARTMENTS[1] (Highway, Buildings. Irrigation, PHSD)		CATEGORY --I (Agriculture, LG&RD. Social Welfare, Livestock)		CATEGORY -- II (Education, Food,Health, Industries)		CATEGORY -- III (Forest, Cooperatives)	
	Policy	Operation	Policy	Operation	Policy	Operation	Policy	Operation
Province	Ministry/ Secretary	Chief Engineer	Minister/ Secretary	Director General	Minieter/ Secretary	DPI/Director[2]	Minister/ Secretary	Chief Conservator/ Registrar.
Division		Superintending Engineer.		Director/Deputy Director[3]		Director/Deputy Director		Conservator/Deputy Registrar.
District		Executive Engineer.		Deputy Director Assistant Director[4]		District Officers/ Assistant Director		DEO/Circle Registrar
Sub-Division		SDO	-	FADA/SWO/Veter-inary Officer[5]		DDEO/ADHO[6]		Sub-DFO/Assistant Registrars
Harkaz		--[7]	--	Officer/PM/SWO Agricultural		Assistant Education Officer		Inspector Block Officer/
Union Council	--	--		Field Assistant Chairman UC/ Veterinary Officer/			-	
Village								

1.In the case of the Irrigation Department, divisional and district levels are not cotermminóus to civil division/district and are instead based on canal system. A Chief Engineer controls four to five circles on canal system and each circle-incharge is called Superintending Engineer. Each circle consists of three to four irrigation divisions and each irrigation division is controlled by Executive Engineer Division is divided into two to four sub-divisions and sub-divisional-incharge is called Sub-Divisional Officer. Each division is further divided into sections controlle by Sub-Engineers.

2.In the case of the Education Department the provincial representative is known as DPI. There are separate DPIs for schools and colleges and for male and female side. All representatives from other departments for this category are designated as Director at the provincial level. At the divisional level the representative of the Education Department is knorn as Director while other departmental representatives at this level are designated as Deputy Director. At the district level these departments are represented either by District Officers (DHO, DEO) or Assistant Directors.

3.In the case of the Agriculture Department the Director is not always placed at the Divisional Headquarter and the jurisdiction of one Director include areas of more than one administrative division. In the case of Social Welfare and Livestock Department the post of Director is placed the Provincial Headquarter along with the post of Director General and there are only Deputy Directors at the Divisional level.

4. In the case of the Agriculture Department the district representative is knovn as Deputy Director while in case of other departments of this category the district representative is knorn as Assistant Director.

5.There is no representative of LG&RD Department at the sub-divisional level.

6.There is no representation of the Food and Industrles Departments at Sub-Division level while at the Markaz level only the Education Department has ita representative for this category.

Planning and deveopment decisions take place along a parallel but separate activity track as indicated in Exhibit A-1. At the provincial level, the Provincial Development Working Party (PDWP) is located in the Planning and Development Department. The Chairman of Planning and Development Board is also the Chairman of the PDWP. Secretaries from departments of finance, communications, and works are members while other members can be co-opted to the Board on a project-by-project basis. The PDWP may sanction or give final approval to projects costing up to Rs 30 million. However, regardless of the cost of the project, all projects requiring a subsidy commitment on the part of the government have to be cleared by the PDWP.

The Divisional Development Working Party is located at the divisional level and works under the chairmanship of the Commissioner of each Division. The sanctioning limit of this forum is fixed at Rs. 2.5 million. The District Development Committee is chaired by the Chairman of the District Council. The sanctioning limit for this forum is Rs. 1.5 million for each individual scheme.

Supportive Development Systems

The preceding paragraphs define the core administrative, planning,development,and elective structures in the province and show how they relate to and interact with each other. How these parallel and mutually supporting systems are used to convert ideas into projects, process them, and arrange their formal sanctions,approval, and implementation is described in subsequent sections of the study.

Development is not handled only by these three constituents of the provincial government. Moreover, preparation and sanctioning of a project by itself cannot be treated as the whole task. There are many agencies outside the traditional administrative, elective, and developmental cadres who independently or collaboratively contribute to the overall development effort. Also, unless the system attends to the needs of financing, implementing, monitoring, and evaluating project and program initiatives, the essential needs of development would not be fully met.In addition to its formal and traditional structure, the provincial government has,either through direct sponsorship or indirect persuasion, encouraged the creation of a variety of semigovernmental and nongovernmental associations or corporate bodies.The reasoning which led to their creation is best discussed in terms of the following four requirements.

Needs of Area Development

Punjab first experimented with setting up non-conventional and extra departmental organizations more then six decades ago. The need arose with the completion of the first of the major irrigation canal systems which serve the province. When the unproductive wasteland was brought under canal command, it was realized that unless extraordinary efforts were initiated to provide it with an adequate social and economic infrastructure its full economic potential would never be realized. "Colonization" efforts were consequently initiated.

These development efforts called for new roads, schools, water channels,hospitals, post offices, telegraph and telephone lines, villages, market towns,allotments, village boundaries, and a host of ancillary activities. This bewildering array could not be handled by the traditional apparatus of the government. It also demanded an unprecedented degree of interdepartmental coordination. Canal command areas were split up into manageable units (generally at district/sub-district level) and placed under colonization officers who would be responsible for developing and colonizing the area and settling the population.

The experience was successful, and the system was resurrected with every new canal irrigation project in the province. For the most recent project, however, there was a slight modification when the colonization program in Thal (part of the barani tract) was placed under a semiautonomous corporate body called the Thal Development Authority instead of being placed directly under the Board of Revenue,Punjab. This Authority faded out in the late 1960s after colonization of Thal was completed, and for the following two decades, Punjab's interventions at area development were to remain confined to major urban centers in the form of Urban Development Authorities (such as, Lahore Development Authority, Multan Development Authority) and Improvement Trusts. However, once again in the 1980s the province appears to be showing fresh interest in the area development strategy. Creation of the Agency for Barani Areas Development,of Murree-Kahuta Development Authority,of Cholistan Development Authority, and of a similar body for D.G. Khan are significant steps toward development of rural areas of the province on an area by area basis.

Needs of Sectoral Development

Historically, it is the federal government that can take credit for first experimenting with nontraditional, semigovernmental corporate interventions to boost efforts in sectors where conventional departmental attempts were flagging or to provide viable arrangements where the traditional departmental arrangements could no longer cope with the demands of development. The Pakistan Industrial Development Corporation and the Water and Power Development Corporation are the earliest such examples. Punjab, however, followed soon after. The list of the province's interventions under corporate aegis in various fields, such as agriculture, industry,education, and health, is formidable. Some examples are the Agricultural Development Corporation and the Industrial Development Board. The advantage offered by this approach is to provide expertise and organizational prowess to critical sectors for development.

Problem-specific Needs

The genesis of attending to problem-specific needs through the medium of nontraditional structures can be traced back to the World War Two. With the war,urgent problems were thrust upon the government of India and its provincial governments, related primarily to the production, movement, and distribution of goods. In many cases they called for interdepartmental coordination and for crises management. Since normal secretarial and departmental structures had not been designed to deal with such situations over sustained periods of time, the government

improvised by setting up supportive bodies to complement the day-to-day functioning of the departments or ministries.

Following the end of the war and the grant of independence, the system was adapted to administrative needs by creating corporate structures in the form of Authorities, boards, or corporations. These bodies were self-administering and not encumbered with functioning under comparatively rigid government rules and procedures. They tended to prove more effective and efficient a formal government department. The government resorted to this alternative when a need arose to focus on a specific activity which generated problems requiring specialized expertise and attention or called for interdepartmental coordination. Examples can be found in the arrangements organized for promotion of some specific agricultural crops and for the small industries sector.

Need for Participation and Private Sector Resource Mobilization

Despite its overwhelming concentration and dependence on the public sector for its development requirements, the government has not lost sight of the potential reservoir of talent and resources that exists untapped in the private sector. It believes that resource mobilization in the private sector and its contribution toward national development objectives are primarily influenced by participation of the community in decision making at the grassroots level. Various experiments have been conducted to increase local participation and resource mobilization, of which the first, almost a century ago, was the cooperatives movement.

Notwithstanding its long history and a sustained government policy and financial commitment, particularly between 1960 and 1965, the movement has only had brief periods of glory. However, it continues to arouse interest not merely as an agency for motivating grassroots participation and mobilization of resources, but also for potentially acting as an effective vehicle for decentralization of responsibility -- and not merely authority.

There are close to 50,000 cooperatives in the province of Punjab today of which about 18,000 are located in the barani area.2 Equally impressive statistics are offered about their membership and share capital, but the surface picture is misleading. Some recent studies suggest that overall coverage of farming communities remains below 40 percent and effective coverage only 15 percent, that the average membership per cooperative continues to decline, that only 40 percent of the cooperatives are active and of them only half are viable and self-reliant and that these are downward trends in shown capital, in reserves, and in deposits if broken down on a pro-rata per membership basis.

The protagonists of the cooperatives argue that all the defects and shortcomings can be remedied and that many of the ills can be traced to unchecked growth and proliferation of cooperatives. They feel that adoption of "one village for a cooperative and one cooperative for a village" principle would rectify most of the defects and lead to a positive change.

The fact remains, however, that despite their long history and a century of experience, a successful, sustainable, and replicable model of a cooperative has yet to emerge. The need for undertaking further experimentation in this field is obvious as is its particular relevance to the barani areas where optimum utilization of limited resources is highly dependent on the ability of the communities to take collective decisions that balance short-term production goals against long-term conservation requirements.

Simultaneously with a commitment to the cooperatives, a variety of experiments were undertaken in the last four decades to achieve participation and resource mobilization through innovative nontraditional structures. Commencing with the Village AID program in the 1950s, the Basic Democracies scheme of the 1960s, and progressing to the People's Works Program and the Integrated Rural Development Program of the 1970s -- based upon pilot project work at Daudzai and Comilla--various alternatives and modes were tested and abandoned. Each program followed the same cycle of investment, failure, disillusionment, and death. Only vestigial signs remain today of the investment effort and money poured into these ventures.

There are indications of revival of interest in the erstwhile Integrated Rural Development Program and the reactivation of the marakiz -- levels of administration between tehsils and union councils which were set up under it. The form of such arrangements and their efficacy are not only germane to development generally, but also directly related to successful implementation and operation of projects likely to emerge as a result of the Master Plan for barani agriculture. The experience with these approaches and procedures is likely to suggest some additional options for sustaining the momentum of planning and development activities on a long term basis within the barani areas.

In addition to the above participatory systems, which can be broadly categorized as semigovernmental, there has been a noticeable development in recent years of purely private interest and initiatives in the form of non-governmental or private voluntary organizations. While most of such organizations -- they number close to 3,000 in the province with about half of them being in the barani area -- concern themselves with welfare activities, some of them are beginning to evince strong interest in economically productive developmental activities.3 The experience of Punjab Land Utilization Authority (PLUA), for example, provides some indication of the existence of completely non-formnal associations undertaking collective responsibilities, while avoiding registration with either the Cooperative Department as cooperative societies or even the Social Welfare Department as nongovernmental organizations.

The main burden of project preparation, sponsorship, implementation, facilitation and monitoring, and operations continues to rest mainly upon the line departments and the supporting corporate bodies set up and controlled directly or indirectly by the government. The contribution, however, of the local government and of the

3 Based upon estimates provided by the Directorate of Social Welfare,Government of Punjab, Lahore.

Facts and Figures of Punjab Land Utilization Authority, Government of Punjab, Lahore, April 1987.

various forms of semigovernment and nongovernmental institutions is by no means insignificant. They possess a latent but unexploited strength to generate projects,monitor them, and even operate them in selective cases. The sustainability of the development process would be greatly assisted if these nonformal structures were to integrate more fully into the development process.

Financial Institutions and Development

No picture of the development arrangements can be complete without describing the funding and budgeting arrangements that ensure the earmarking of adequate funds and their flow to the development projects and programs. Because of the nature of the linkages, a discussion of the subject must describe the overall framework to explain relationships between public and private sector investments, as well as the fiscal, monetary, and developmental relationships between provinces and the federal government.

A few years after independence, Pakistan decided to initiate steps toward centralized state planning for development. Adaptations and refinements of the fiscal and monetary systems then in force were undertaken to meet the requirements of the new state policy, which was installed in the mid-1950s. To implement this new policy, the following arrangements were devised, which with some refinements continue to remain operative today. Substantive elements of this policy were:

· To evolve an agreed definition of developmental and nondevelopmental expenditures which would govern earmarking of resources for capital investment and revenue expenditures;

Estimation of national resources to be undertaken in both public and private sectors every five years to determine the surplus that can be invested and to work out its optimal utilization; considerations of productivity and equity to be kept in mind;

While public sector resources were directly under the charge of the government itself, the use of private sector resources to be influenced indirectly through controls such as fiscal and monetary instruments, tariffs and taxation, exchange and import controls, and zoning laWs;

The state Five-Year Plans to be essentially policy documents prepared in conjunction with and through collaboration with the provincial governments;annual budgets and Annual Development Programs to be used to enforce and sustain the desired degree of discipline;

Creation of a Planning Commission and of its equivalent, the Planning and Development Departments, in theprovinces to exercise an overseeing/coordinating role;

Creation of forums for sanctioning, budgeting, monitoring, evaluating,ranking projects and programs, including such organizations such as the National Economic Council and its Economic Committee, the Central Development Working Party (CDWP), and the Provincial Development Working Party (PDWP);

Devising and putting into place procedures and formats to ensure systematic preparation, evaluation, and selection of projects; and

Procedures for reviewing ongoing programs and projects, detection and anticipation of shortfalls, and systems for interproject and intersectoral transfer of funds through reappropriation and supplementary budgets to maximize effective use of development resources.

Comparable systems, though reflecting a lesser and more indirect approach, were also introduced to supervise the use of resources generated in the private sector.The ability of the government to influence private sector decisions significantly diminished with the passage of time. Experience of the past three plan periods suggests in no uncertain terms that with the relaxation of contols on location and foreign exchange and liberalization of import policies, government has been left with very little leverage to influence investment decisions by the private sector. Indeed,even the inducements of tax incentives offered to investors in less developed areas have only marginally influenced the flow of investment toward depressed or lagging areas of the country.

This experience suggests that attracting privately financed activities for providing employment, generating nonfarm income, and adding value to locally produced raw materials may require intensive government investment in adequate infrastructure and social overhead to compensate for locational disadvantages. Direct government investment may have to be combined with instruments such as energy differentials and credits in order for lagging areas of the country to become attractive for private developmental investment. Tax incentives alone are not likely to work.

Financial resources available to the province of the Punjab comprise its tax receipts, nontax revenues, and the funds received from the federal government. This latter group includes grants received as transfers of excise duty and royalty at well head for natural gas, profits for generation of hydro-electricity, special allocations for specific sectoral programs, and discretionary loans and grants for meeting budget deficits and undertaking special development projects.

The province started with a surplus immediately after independence. For many years Punjab not only continued to finance its recurring nondevelopmental expenditure but also continued to invest handsomely in creation of capital assets.The situation today, as indicated below in Table A-1, is less healthy.

Project Development Cycle

Initiation **of Project Ideas**

Projects can originate from several different sources including the federal government, the line departments of the provincial government, and the autonomous/semiautonomous organizations that operate as part of the province,such as development authorities and agencies. The majority of the development projects are, however, initiated by the nation-building line departments. Project planning begins with identification by line departments, which prepare technical designs.

TABLE A-1
PUNJAB PROVINCE BUDGET SUMMARY 1984-1985
(millions Rs)

Receipts		Expenditures	
Tax	1,844.0	Capital	4,087.3
Non-tAX	2,074.3	Revenue	11,106.4
		Debt Service	2,784.4
Total	3,918.3	Total	17,978.1
		(Deficit)	(14,059.8)

Source: National Financial Statistics

An illustration of how this process works in the Department of Forestry shows the evolution through which a project passes and explains how consultation and coordination are maintained between Lahore and the field offices. For a project to be carried out it must progress from an idea to a line item with funds allocated for its execution in the province's Annual Development Programme (ADP). In the Forestry Department, for example, the heads of its field departments (Forestry,Tourism, Range Management, and Fisheries) accompanied by the divisional officers,meet together on a monthly basis to consider ideas for projects. These ideas have been assembled by their respective departmental and divisional officers and are presented in the form of a concept clearance pro forma.

Those which survive scrutiny at this level are reviewed, again within the department by the Senior Forestry Officers Conference. The Conference, as its name implies, provides a forum for deliberation on the part of the department's top management and is chaired by the Minister of Forestry or the Secretary, in the Minister's absence. The members debate the concept clearance pro formas and arrive at a consensus concerning which ones should be further developed in detail in the PC-1 format.

Those projects that are determined to be desirable are returned to officers in one of the four attached departments at the district level for elaboration. The PC-1is prepared and forwarded to the head of the concerned attached department in Lahore, who then transmits the PC-1 to the Director of the Planning Division within the Forestry Department. Both the Minister and Secretary have a final look at the project before it is sent to the Planning and Development Department for their review.

Review and Appraisal of Projects for Funding and Approval

Scrutiny of project proposals in the form of PC-1s is the responsibility of the Planning and Development (P&D) Department. P&D is organized into sections,each responsible for a sector or a group of sectors, and is headed by a Section Chief.The review is handled almost exclusively by the section concerned. If the project relates to more than one sector, the proposal can be circulated and examined in other concerned sections.5 The review process includes a meeting among the Section Chief in P&D, the head of the field department inthe Forestry, and the Director of Planning,Forestry Department.

The sponsoring department indicates in the PC-1 pro forma, the manner in which the proposed project fits into the current Five-Year Plan (FYP) strategy. A set of economic criteria are employed based upon parameters such as net present Values, internal rates of return, and return on investment to evaluate the projects and to compare them with other project options. It is uncertain whether or not there are published minimums or ranges of acceptable values established by the federal or provincial government. It appears however, that the notion of viability may be influenced by the location of the project. A barani project may be given more liberal treatment than one from an irrigated area, in recognition of the difficulty in achieving dramatic results from investments.6

Assessment of projects -- in the irrigation sector, for example -- involves two steps for determining feasibility, a technical and a socioeconomic analysis. P&D appears to have the capacity to do technical review within the section concerned.On the socioeconomic side, the analysis may at times be entrusted to one of P&D's more specialized associates such as the Punjab Economic Research Institute. This process for appraisal was used in evaluating locations for improvements as part of the Small Dams Project financed by the Asian Development Bank.

Livestock, forestry, and fisheries sectors provide interesting illustrations of how social aspects and potential impacts of projects are addressed in the review and appraisal process. In reviewing projects submitted by the line department, social aspects are considered to be quite important. In the deliberations of the PDWP they are frequently a topic of discussion and are generally included by the staff in the body of working papers. Issues such as traditional grazing rights and the social and economic role that livestock may have in barani areas are typical of those that might be considered. Still, all projects whether within or outside of the barani tract must make sense in economic and financial terms.

Individual project proposals as expressed in the PC-1 format may at times remain silent about important strategy aspects. However, the scrutiny undertaken within the P&D and the working papers prepared by the concerned section reflect more in-depth analysis. Under the heading of project scrtiny the following issues might be raised and suggestions made to the PDWP concerning appropriate solutions:_____

5 Interviews in the Planning and Development Department, September 9,1987.

6 Interviews with Planning and Development Department, Lahore,September 9,1987.

· What is the explicit and implicit subsidy being proposed; how does it compare with those of other projects undertaking comparable activities, and is there any reason to deviate from accepted practices or precedents?

Will project duplicate activities already being undertaken by other development initiatives or government activities?

In what ways do the activities of a proposed project complement or conflict with those of ongoing projects?

Can lessons learned from experiences with other development projects be used in formulating strategy and operational plans for a project currently being considered?

What data and information are missing which are necessary to understand the conditions warranting public investment and providing an indication of the desirability and viability of a project?

What technical departments within the provincial government should be called upon to review specific project components and to comment upon the assumptions, estimates, and design work contained within a project proposal?

How can progress be monitored and successful implementation assured by linking activities to the achievement of physical targets?

What sort of analysis needs to be conducted to evaluate the desirability of the individual components and the whole of a proposed project? Should benefits and costs be estimated so that they can be compared?

Assuming that the project receives a favorable review, frequently with certain changes, the PC-1 is sent to the PDWP for its approval and inclusion in the ADP and financing from provincial sources. If the project is beyond the financial limits laid down for the PDWP, it is transmitted to the federal government for consideration by the CDWP/Economic Committee of the National Economic Council (ECNEC).

Sanctioning of Projects

Projects are divided by size and cost for the approval or sanctioning by the appropriate body or individual with overall responsibility for implementation. The sanctioning process is intended to ensure that the details of implementation are adequately looked after. The rules concerning grant of approval and sanctions of development projects include:

7See for example, "Integrated Land and Water Resource Development Project for Selected Barani Areas of Punjab," Working Paper, Government of Punjab,Planning and Development Department, Agricultural Sector, Annex 1.

· Up to Rs I million approval or sanctioning can be done by the department head at the provincial level.

Up to Rs 4 million approval can be done by the Departmental Development Committee,chaired by the Secretary.

· Up to Rs 30 million approval must be handled by the PDWP.

· Projects costing more than Rs 30 million require reference to the ECNEC through the CDWP.

The act of sanctioning can be separated into two parts. Administrative sanctions signify that all procedural formalities, including funding, stand completed and that the project can be carried out from an administrative point of view.Technical sanctions are an additional requirement where a finding by a technically competent department is necessary to ascertain that a project is technically sound.

Planning and Development will in theory not fund a project unless it is sanctioned as required above. However, many of the schemes listed in the current year's ADP are shown as unapproved. The schemes appear to reserve money for a particular activity that has already been budgeted and is agreed as being desirable.However, funds will not be released until the necessary sanctioning takes place.After appearing in the ADP, projects may never be sanctioned for one reason or another. Further examination of the project may reveal that it is not feasible from a technical, economic, financial, or organizational point of view. In this event, there needs to be a reallocation of these reserved funds either within a sector or in unusual cases between sectors. This reappropriation is done by P&D in association with the Finance Department. Funds to be transferred within the same sector can be authorized by the Chief of that sector within P&D. Funds to be moved between sectors must be cleared by the Chairman of the PDWP. Since the ADP is approved by the provincial assembly, a supplementary budget for intersectional transfers is submitted to the assembly for its approval.

Execution **of Projects**

Projects can be executed in one of several ways. Some departments -- such as Forestry -- are relatively self contained and have the capacity to construct their own facility needs, such as roads, bridges, and structures. In this case, there is seldom the need to approach another line department for assistance in design or implementation of project components. Only in the case of irrigated plantations does the Forestry Department need to approach the Irrigation Department for its consent to provide water under the terms of a 1964 law reserving 10 percent of all water for forestry purposes.

Other departments are not so self-sufficient. For project design and implementation, they have varying degrees of dependency, for project design and implementation, on other line departments, such as the Communications and Works Department. Experience has shown that getting the attention and cooperation of other departments at both these critical stages in the project cycle has at times impeded performance. There appears to be a scarcity of formal mechanisms to facilitate coordination at this level, and informal ties between individuals often prove

more effective than formal interdepartmental arrangements. Partially for this reason,Tourism was recently changed from a department to a corporation, governed by a Board of Directors. It is now financed by provincial block grant allocations with the power to undertake its own work in the area of facilites design, construction, and **supervision** without having to rely upon other provincial departments.

Monitoring Projects

Monitoring projects is undertaken by the Planning and Development Department,by ABAD as its agency, and by the monitoring and evaluation units of the line departmentsand corporations, which are directly responsible for project implementation. In the case of the Forestry Department, this unit is a directorate under the Secretary and is independent of the four operating departments in Forestry. This enables monitoring to be done in an impartial and objective fashion.Monitoring should not be confused with evaluation. While there is an abundance of the former, the latter is a less routinized occurrence.

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Directorate of Manpower and Training	Manpower Planning Stats	Wing	List of Establishments Employing 10 or more Workers Surveyed During the Year 1977-78	Lahore	1979
Directorate of Manpower and Training	Manpower Statistics Div	sn	Report on Rural Manpower & Employment (Serial No. 24)	Lahore	198
Directorate of Manpower and Training	Manpower Statistics Di	vsn	Report on Annual Establishment Enquiry for 1982-83	Lahore	1985
Directorate of Manpower and Training	Manpower Statistics Divsn		Report on List of Establishments Employing 20 or More Workers for the Year 1984-85	Lahore	1986
Economic Advisers Wing, Ministry of Finance	Finance Ministry		Economic Survey 1982-83	Islamabad	1983
Economic Analysis Network Project	Economic Analysis Network Project		EAN Membership Directory	Islamabad	1987
Federal Bureau of Statistics	Federal Statistics Bureau		Household Income and Expenditure Survey, 1979	Karachi	1983
Federal Bureau of Statistics	Federal Statistics Bureau		Monthly Statistical Bulletin, Vol. 34, No.11	Karachi	1986
Federal Bureau of Statistics	Federal Statistics Bureau		Environment Statistics of Pakistan	Islamabad	1985
Federal Bureau of Statistics	Federal Statistics Bureau		Pakistan Statistical Yearbook 1986	Islamabad	1986
Federal Bureau of Statistics	Federal Statistics Bur	eau	Labour Force Survey 1984-85	Karachi	1986
Federal Bureau of Statistics	Federal Statistics Bure	au	Foreign Trade Statistics of Pakistan: Imports April-June 1985	Karachi	1985
Federal Bureau of Statistics	Federal Statistics Bure	au	Monthly Statistical Bulletin	Islamabad	1986
Finance Division, Economic Advisers Wing	Finance Ministry		Economic Survey 1985-86	Islamabad	1986

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Food & Agricul ture Ministry	Agricul ture Ministry		Agricultural Statistics of Pakistan 1977	Islamabed	1 978
IBRD	IBRD		Pakistan Review of the 6th Five-Year Plan	Vashington,DC	1 983
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Ministry of Food and Agriculture	Agricul ture Ministry		Agricultural Statistics of Pakistan, 1980	Islamabed	1 981
National Institute of Psychology	Hassan, Dr. Iftikhar N.		Future Educational Aspirations of Rural Females	Islamabed	MA
National Institute of Psychology	Hassan, Dr. Iftikhar N.		Psychological Profile of Rural Momen	Islamabad	1982
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National Transport Research Centre	Hundal,S.H.		Transport Statistics 1984, Vol. 1, MTRC-83	Islamabad	1985
Pakistan Agricul tural Research Council	Ali,M.M.	Sial,M.H.	Constraints to High Yield of Wheat in Punjab, 1980-81: On-Farm Yield Constraints Research in Pakistan	Islamabad	1983

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Pakistan Agricul tural Research Council	Chaudhary,A.M.		Cost of Production of Major Crops in Jhelum, 1979-80	Faisalabed	1982
Pakistan Agricultural Research Council	Chaudhary,A.M.	Ahmad,B.	Cost of Producing Major Crops .in Non-Canal Irrigated Area of Gujranwala, 1979-80	Faisalabed	1982
Pakistan Agricultural Research Council	Chaudhary, Dr.M.A.	Ahmad,B.	Foodgrain Storage Projections for Public Sector in Pakistan	Faisalabed	1981
Pakistan Agricul tural Research Council	Mallorie,E.R.		Evaluation of Economic Viability of Innovation in Feeding of Dairy Animals	Islamabad	1987
Pakistan Economic Research Institute	Ali,M.M.	Rahman,A.	Farm Accounts, Family Budgets of Selected Rural Families & Cost of Production of Major Crops in the Punjab, 1977-78 & 1978-79	Lahore	1981
Pakistan Economic Research Institute	Ali,M.M.		Farm Accounts, Family Budgets of Selected Rural Families & Cost of Production of Major Crops in the Punjab 1976-77	Lahore	1979
Pakistan Economic Research Institute	Ali,M.M.		Marketing of Farm Products & Farm Inputs in Barani Punjab & NUF	P Lahore	1979
Pakistan Engineering Congress	Mashhadi, S.N.H.		Symposium on Rural Development Annual Session, Vol. 18(1404-1405 Hijra)	Lahore	1985
Pakistan Institute for Devt Economics	Alam,1.	Irfan,M.	Fertility Levels, Trends & Differentials in Pakistan: Evidence from Popultn Labor Force & Migration Survey 1979-80	Islamabad	
Pakistan Institute for Devt Economics	Aslam,A.		Structure of Farm Holdings, Population Pressure & Resource Use in Pakistan's Agricul ture	Islamabad	1980
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Pakistan Institute for Devt Economics	Bilqueea,F.	Hamid,s.	Impact of International Migration on Momen & Children Left Behind: A Case Study of a Punjabi Village	Islamabad	1961

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Pakistan Institute for Devt Economics	Butt,M.I.		List of Doctoral Dissertations and M.A. Theses	Islamabad	1984
Pakistan Institute for Devt Economics	Cornelisse, P.A.	Naqvi, S.N.H.	The Wheat Marketing Activity in Pakistan	Islamabad	1987
Pakistan Institute for Devt Economics	Gilani,I.	Khan,M.F.	Labour Migration from Pakistan to Middle East and Its Impact on the Domestic Economy,Parts 1,2,&3	Islamabad	1981
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Pakistan Institute for Devt Economics	Irfan,M.	Demery,L.	Migration Pattern in Pakistan: Preliminary Results from a Plan Survey	Islamabad	1979
Pakistan Institute for Devt Economics	Irfan,M.		Poverty and Household Demographic Behavior in Pakistan:Insights from a Plan Survey,1979	Islamabad	1985
Pakistan Institute for Devt Economics	Irfan,M.		Pakistan Labour Force, Its Size and Structure:A Review of the Evidence	Islamabad	1981
Pakistan Institute for Devt Economics	Kemal,A.R.		Income Distribution in Pakistan: A Review	Islamabad	1981
Pakistan Institute for Devt Economics	Khan,Z.		Breast Feeding in Pakistan	Islamabad	1985
Pakistan Institute for Devt Economics	Mahmood,N.	Ali,S.M.	Nuptiality Pattern in Pakistan	Islamabad	
Pakistan Institute for Devt Economics	SSRC, University Punjab		Factors Influencing Migration to Urban Areas in Pakistan:A Case Study of Gujranwala City	Islamabad	1977

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Pakistan Institute for Devt Economics	Salam,Dr.A.		Structure of Farm Holdings,Population Pressure & Resource Use in Pakistan Agricul ture	Islamabad	1980
Pakistan Institute for Devt Economics	Sarmed,K.		Pakistani Migration to Middle East Countries	Islamabad	1985
Pakistan Institute for Devt Economics	Sathar,Z.A.	Ali,S.M.	Socioeconomics and Demographic Character of Population in Pakistan: Findings of Population Labor Force Migration Survey 1979-80	Islamabad	1984
Pakistan Institute for Devt Economics	Slam,A.		Structure of Farm Holding,Population and Resource Use in Pakistan Agricul ture	Islamabad	1980
Pakistan Institute for Devt Economics	Soomro,G.Y.	Ali,S.M.	Prevalence of Knowledge & Use of Contraception in Pakistan	Islamabad	
Pakistan Institute for Development Economics	Chaudhary,M.G.		Rural Employment in Pakistan: Magnitude & Relevant Strategies	Islamabad	1981
Pakistan Manpower Institute	Hyder,Dr.S.N.		Employment for Momen in Pakistan	NA	1983
Peshawar Development Authority	Kirke,G.H.	Tym,R.	Development Planning Programme for Peshawar: Task 6 Structure Plan Programme	Peshawar	NA
Planning Commission	Planning Commission		Federal Government Public Sector Development Programme,1986-87	Islamabed	1986
Population Census Org Statistics Division	Population Census Orgn		Housing Census Report of Punjab	Islamabad	1980
Population Census Orgn	Population Census Orgn		1981 Census Report of Islamabad	Islamabad	1983
Population Census Orgn	Population Census orgn		1981 District Census Report of D.G.Khan	Islamabad	1984
Population Census Orgn	Population Census Orgn		Districts Census Report, Sialkot 1972	Islamabad	1977
Population Census Orgn	Population Census Orgn		District Census Report, Gujrat 1972	Islamabad	1977
Population Census Orgn	Population Census Orgn		1981 District Census Report of Sargodha	Islamabad	1984

Publ isher	First Author	**Second Author** (if any)	Title	**Location Published**	Year
Population Census Orgn Statistics Division	Population Census Orgn		1981 Census Report of Pakistan	Islanabed	198
Population Census Orgn Statistics Division	Population Census Orgn		1981 Census Report of Punjab Province	Islamabed	198
Population Census Orgn Statistics Division	Population Census Orgn		1981 District Census Report of Sialkot	Islamabad	1984
Population Census Orgn Statistics Division	Population Census Orgn		1981 District Census Report of Mianwali	Islamabed	1984
Population Census Orgn Statistics Division	Population Census Orgn		1981 District Census Report of Gujrat	Islasabad	1984
Population Census Orgn Statistics Division	Population Census Orgn		1981 District Census Report of Jhelum	Islamabed	1984
Population Census Orgn Statistics Division	Population Census Orgn		1981 District Census Report of Rawalpindi	Isla	1984
Population Census Orgn Statistics Division	Population Census Orgn		1981 District Census Report of Attock	Islamaad	1984
Population Census Orgn Statistics Division	Population Census Orgn		1981 District Census Report of Jhang	Islamabad	1984
Population Census Orgn Statistics Division	Population Census Orgn		1981 District Census Report of Muzaffar Gharh	Islamabed	1984
Population Census Orgn Statistics Division	Population Census Orgn		Handbook of Population Census Data, Pakistan, 1951-81	Islamabed	1985
Population Census Orgn Statistics Division	Population Census Orgn		Handbook of Population Census Data, Punjab, 1951-81	Islamabad	1987
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			D		g, 1972	Islamabad	1977
Population Census Orgn Statistics Division	Population Census Orgn			istrict Census Report, Jhan			
Population Census Orgn Statistics Division	Population Census Orgn		D	istrict Census Report, D.G.	Khan 1972	Islamabad	1977
Population Census Orgn Statistics Division	Population Census Orgn		D	istrict Census Report, Sargo	cha 1972	Islamabad	1977
Population Census Orgn Statistics Division	Population Census Orgn		D	istrict Census Report, Mianw	ali 1972	Islamabad	1977
Population Census Orgn Statistics Division	Population Census Orgn		D	istrict Census Report, Jhelu	m 1972	Islamabad	1977
Population Census Orgn Statistics Division	Population Census Orgn		D	istrict Census Report, Atto	ck 1972	Islamabad	1977
Population Census Orgn Statistics Division	Population Census Orgn		D	istrict Census Report, Rawalp	indi 1972	Islamabad	1977
Population Census Orgn Statistics Division	Population Census Orgn		D	istrict Census Report, Muzafa	rgarh 1972	Islamabad	1977
Presented in Conference	Hassan, Dr. Iftikhar N.			Closing the Education Gap: Fr	om Literacy to Higher Educat	ion Washington, DC	1986
Punjab Bureau of Statistics	Punjab Bureau of Statisti		cs	Statistical Pocket Book of th	e Punjab	Lahore	1985
Punjab Bureau of Statistics	Punjab Bureau of Statisti		cs	Development Statistics of the	Punjab 1972	Lahore	1972
Punjab Bureau of Statistics	Punjab Bureau of Statisti		cs	Punjab Development Statistics	1983	Lahore	1983
Punjab Bureau of Statistics	Punjab Bureau of Statistic		s	Punjab Development Statistics	1980	Lahore	1981
Punjab Bureau of Statistics	Punjab Bureau of Statistic		s	Punjab Development Statistics	1986	Lahore	1987
Punjab Bureau of Statistics	Punjab Bureau of Statisti		cs	Development Statistics of the	Punjab 1976	Lahore	1977

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Punjab Bureau of Statistics	Punjab Bureau of Statistics		Rabi 1985-86 Crop Acreage Statistics of the Punjab	Lahore	1985
Punjab Bureau of Statistics	Punjab Bureau of Statistics		Kharif 1985 Crop Acreage Statistics of the Punjab	Lahore	1985
Punjab Bureau of Statistics	Punjab Bureau of Statistics		Rabi 1980-81 Crop Acreage Statistics of the Punjab	Lahore	1980
Punjab Bureau of Statistics	Punjab Bureau of Statistics		Kharif 1980 Crop Acreage Statistics of the Punjab	Lahore	1980
Punjab Bureau of Statistics	Punjab Bureau of Statistics		Kharif 1976 Crop Acreage Statistics of the Punjab	Lahore	1976
Punjab Bureau of Statistics	Punjab Bureau of Statistics		Rabi 1976-77 Crop Acreage Statistics of the Punjab	Lahore	1976
Punjab Bureau of Statistics	Punjab Bureau of Statistics		Rabi 1971-72 Crop Acreage Statistics of the Punjab	Lahore	1971
Punjab Bureau of Statistics	Punjab Bureau of Statistics		Kharif 1972 Crop Acreage Statistics of the Punjab	Lahore	1972
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Punjab Economic Research Institute	Ashiq,M.		Area Allocation Decisions: A Study of Pakistani Farmers' Responsiveness to Changes in Prices	Lahore	1981
Punjab Economic Research Institute	Aslam,M.		Rice Economy in the Punjab, with a Particular Focus on Consumption Prospects	Lahore	1982
Punjab Economic Research Institute	Cheema,M.A.		Farm Accounts, Family Budget of Selected Rural Families & Cost of Production of Major Crops in Punjab 1979-80	Lahore	1982
Punjab Economic Research Institute	Eckert,J.B.	Khan,D.A.	Rural-Urban Labor Migration: Evidence from Pakistan	Lahore	1977
Punjab Economic Research Institute	Elahi,M.	Khan,M.J.	Rural Labour Market With Special References to Hired Labour in Punjab	Lahore	1983
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Punjab Economic Research Institute	Khan,D.A.	Ashiq,M.	The Demand for Fertilizer in Pakistan	Lahore	1981
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Punjab Economic Research Institute	Khan,D.A.		Employment and Occupational Change in Rural Punjab: Consequences of the Green Revolution	Lahore	1978
Punjab Economic Research Institute	Khan,E.A.		New Technology and Rural Transformation: A Paper Presented in a Seminar	Lahore	1978
Punjab Economic Research Institute	Khan,M.A.	Khan, M.J., Sarwar,M.	Socioeconomic Study of Rural Area in Gujranwala District Pakistan	Lahore	1984
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Punjab Economic Research Institute	Khan,M.J.	Sarwar,M.	A Socioeconomic Study of Farming in Azad Jammu & Kashmir	Lahore	1982
Punjab Economic Research Institute	Khan,M.J.	Bukhari,S.A.	Evaluation of Cotton Maximization Project in Punjab, 1980-81	Lahore	1981

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Punjab Economic Research Institute	Malik,I.H.	Akhtar,S.M.	Socioeconomic Changes in Rural Areas of the Punjab Region,Part 1	Lahore	1966
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Punjab Economic Research Institute	Malik,M.H.		An Economic Analysis of Tractor Hire Market in Punjab: A Case Study	Lahore	1983
Punjab Economic Research Institute	Mohammad,s.		Farm Accounts & Family Budgets of Selected Rural Families of Punjab	Lahore	1978
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Punjab Economic Research Institute	Shah,H.N.		Evaluation of Dehi Mazdoor Training Program of PSIC in Punjab	Lahore	1985
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Punjab Institute for Devt Economics	Qureshi,s.k.	Malik, S.J.	Some Aspects of Agricultural Prices & Taxation Policies in Pakistan	Islamabad	1985
Punjab Institute for Devt Economics	Abbasi,N.	Irfan,M.	Socioeconomic Effect of Intl Migration on Families Left Behind	Islamabad	
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Sociology Department, Punjab University	Anwar,M.		Review of Sanitation Programme in the Districts of Jhelum & Rawalpindi	Lahore	1984

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USAID	USAID		Pakistan Edible Oils Stock & Trade Management: How to Improve Market Stability, Lower Import Costs & Save Foreign Exchange	Islamabad	1985
Women Development Research & Training Academy	W.D.R.& T.A.		An Evaluative Study of Twelve Centres of Lahore & Karachi Run by PVHVA & Aided by Catholic Relief Service	Islamabad	
Women's Division	Abbasi,M.B.		Socioeconomic Characteristics of Momen in Sind:Studies on Rural Momen in Sind	Islamabad	1980
Women's Division	Associates,B.K.M.		Invisible Workers: Piece Work Labour Amongst Momen in Lahore	Islamabad	1984
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Pakistan Institute for Devt Economics	Naqvi, S.N.H.	Qurashi, S.K.	"Structure of Rural Income," in Pakistan Development Review. Vol.24, Autumn, Winter 1985	Islamabad	1985

APPENDIX A

PARTICIPANTS IN THE MASTER PLAN

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PARTICIPANTS IN **THE** MASTER PLAN

INTERNATIONAL CONSULTANTS: DEVELOPMENT ALTERNATIVES, INC.
(Washington, **D.C.)** and HARZA ENGINEERING **COMPANY (Chicago, Illinois)**

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Jamil Ahmed,Institutional Analyst
Martin Billings,Economist
Darrell Deppert,Inland Fisheries Specialist
Jonathan Greenham,Agronomist
Gregory Greenwood,Rangeland and Livestock Specialist
Karen R. Polenske, Senior Regional Planner
Timothy Synnott, Forestry Specialist
Miles Toder, Regional Planner
Anastasia Tzavaras, Development Planner

NATIONAL CONSULTANTS: NATIONAL **ENGINEERING** SERVICES **(PAKISTAN)**

Mian M. Shafi, Livestock Specialist
Iftikhar N. Hussan, Rural Sociologist
Abdul Malik, Agronomist
Asif Khan,Farm Management Systems/Economist

COUNTERPART OFFICERS OF MASTER PLAN **PROJECT** (ABAD), RAWALPINDI

Haq Nawaz Shah,Project Director
Mohammad Jawaid Iqbal,Rural Sociologist
Mohammad Shafqat Iqbal,Statistical Officer
Ishtiaq Ahmed, Planning and Evaluation Officer
Safadar Ali Zafar, Water Engineer
Mian Mohammad Hussain,Soil Conservation Officer
Arshed Ali, Livestock Officer
Mian Maqsood Alam, Rangeland Officer

SUPPORT STAFF OF MASTER PLAN PROJECT (ABAD),RAWALPINDI

Tariq Mehmood Qureshi, Stenographer
Ali Abid Hussain,Stenographer
Mohammad Akram, Stenographer
Mohammad Yasin Sheikh,Stenotypist
Mansha Khan Gondal, Office Assistant
Sabir Hussain,Office Assistant
Misal Shah,Office Assistant
Mohammad Ashraf Anjum, Draftsman
Mohammad Akram, Driver
Fordil Khan,Driver
Sarfaraz Khan Niazi, Driver
Abdul Qayyum,Driver
Muzaffar Hussain, Driver
Ghulam Qadir,Driver
Faiz Zaman, Naib Qasid
Mohammad Saghir, Naib Qasid
Nazakat Ali, Naib Qasid
Rafaqat Ali,Masih