PN-ABU 840

SOCIO-ECONOMIC PROFILE

OF

BAJAUR AGENCY

PREPARED FOR:

The Planning and Development Department, The Government of North West Frontier Province

BY:

Technical Support and Planning Unit (TSPU),
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Rural Development Division (RDD)

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

USAID

BAJAUR AGENCY

LEGEND

- INTERNATIONAL BOUNDARY
- TRIBAL BOUNDARY
- TEHSIL BOUNDARY
- EXISTING PAVED ROAD
- RIVER / STREAM / KHWAR
- AGENCY HEADQUARTER
- VILLAGES / TOWNS

0 4 8 12 16 KM

Preface

This is the fifth in a series of seven profiles of the tribal agencies. All profiles are funded by the Tribal Areas Development Project (TADP). The four completed cover Kurram, Orakzai, North Waziristan and South Waziristan. Each profile is accomplished by a base map with 11 overlays depicting:

- Area under cultivation
- Irrigation facilities
- Agricultural facilities
- Forestry areas such as plantations and nurseries
- Animal husbandry facilities
- Health facilities and potable water supply schemes
- Boys' Schools
- Girls' Schools
- Roads under construction
- Electrification
- Refugee camps

The purpose of these profiles is to make available to the public what is known about the present conditions within each tribal agency. Baseline data is often difficult to obtain and the reliability of the data is sometimes questionable. However, within these limitations, primary and secondary data has been collected and analyzed. The basic limitation is reliable population statistics since no population census has been undertaken in over eleven years. Previous census data has been disputed by various government agencies. The scheduled population census of 1991 has not taken place. Furthermore, the recent movement of Afghan refugees from the 25 camps will have a major impact on the socio-economic conditions of Bajaur Agency.

USAID would like to thank the Political Agent from Bajaur Agency and his staff, the line agency staffs, and officials of the Planning and Development Department for providing information in this report and sharing their views.

The research was carried out by USAID/RDD Technical Support Planning Unit in Peshawar and implemented by Mr. Ziauddin, Senior Researcher of USAID. Other contributors were Mr. Taimur Azam Khan, Mr. Sikandar Khan, Mr. Mumtaz Bangash and Mr. Ahmad Khan. The maps were completed by Mr. Riaz Ahmad, Cartographer, and Miss Shaheen Kausar, Draftsperson. Mr. Zafar Iqbal did most of the typing.

Salient Features of Bajaur Agency (Year 1991)

Area	= 1290 Square Kilometers
Population (estimated in 1991)	= 380,000
Population density (estimated in 1991)	= 295 persons per square kilometer

Administrative Units

Agency Headquarters: Khar

Sub Divisions	Tehsils
Khar	Khar
	Salarzai
	Utman Khel
Nawagai	Nawagai
	Mamund
	Barang
	Chamarkand

Land Use:- Percentage of Agency's cultivated area	= 43 percent
Major Crops	Wheat, Barley, Maiz, Rice, Rape & Mustard
Operating Tubewells	= 110

Livestock status

Cattle	= 85/Sq Km
Buffalos	= 12/Sq Km
Sheep	= 58/Sq Km
Goats	= 48/Sq Km
Asses	= 9/Sq Km
Poultry	=560/Sq Km
Veterinary Hospital	= 1
Veterinary Dispensaries	= 14
Veterinary Centers	= 5

Communications

Paved Roads	=126.8 Km
Shingled Roads	= 66.9 Km
Public Telephone exchange	= 1
Telegraph office	= 1
Post office	= 1

Education

Number of Primary Schools	= 236	
Number of Middle Schools	= 20	
Number of High Schools	= 16	
Female Primary Participation Rate	= 4	percent
Male Primary Participation Rate	= 66	percent
Male Middle Participation Rate	= 15	percent
Male Secondary Participation Rate	= 4	percent

Health

Civil Hospitals	= 2	
Basic Health Units	= 17	
Rural Health Center	= 1	
Civil dispensaries	= 10	
Hospital & Dispensaries' beds	= 76	

Electrification:

Percentage of Agency's villages electrified.	= 75	percent

Investment

Total investment allocations from 1974-75 to 1992-93	= 998	million rupees

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ADP	Annual Development Program
AI	Artificial Insemination
APA	Assistant Political Agent
APO	Assistant Political Officer
BHU	Basic Health Unit
C&W	Communication and Works Department
EADA	Extra Assistant Director of Agriculture
EPI	Expanded Program for Immunization
EXEN	Executive Engineer
FATA	Federally Administered Tribal Areas
FATA-DC	Federally Administered Tribal Areas Development Corporation
FR	Frontier Region
GOP	Government of Pakistan
LG&RDD	Local Government and Rural Development Department
MNA	Member, National Assembly
NAS	Narcotics Affairs Section
NWFP	Northwest Frontier Province
PA	Political Agent
PHED	Public Health Engineering Department
RTV	Refugee Tented Village
SDO	Sub-Divisional Officer
SHU	Sub Health Unit
UNHCR	United Nations High Commission for Refugees
USAID	United States Agency for International Development
WAPDA	Water and Power Development Authority

Introduction to the Maps

We relied on Survey of Pakistan maps in drawing a new base map of Bajaur Agency. The Survey of Pakistan maps were on a scale of 1:50,000 and contained roads (shingle, paved and tracks), rivers, towns, contours and Agency boundaries.

The maps are as follows:

1) 1:50,000 base map with villages, roads, elevation contours, rivers, tois, and refugee camps.

2) 1:50,000 transparent overlay for the base map, showing elevation and vegetation shadings. Areas of vegetation may have changed since data were collected for the Survey of Pakistan maps.

3) two 1:50,000 transparent overlays for the base map, one showing girls' schools and the other boys' schools as of December 1990.

4) 1:50,000 transparent overlay for the base map, showing ground and surface water irrigation schemes. The schemes are marked by the village they serve.

5) 1:50,000 transparent overlay for the base map showing health facilities and potable water projects.

6) 1:50,000 transparent overlay for the base map showing agricultural facilities.

7) 1:50,000 transparent overlay for the base map showing forestry facilities.

8) 1:50,000 transparent overlay for the base map showing animal husbandry facilities.

9) 1:50,000 transparent for the base map showing the electricity grid.

A distinction was made on the maps between projects under construction and projects completed if that information was available at the time of printing. The legend for the maps gives the appropriate symbol for both planned and completed projects. Where appropriate, plans are mentioned in the narrative report. These maps will require annual revision as projects become completed. New schools or the upgrading of existing schools, roads, health facilities, irrigation schemes, and the like will need to be added if the maps are to continue to be useful.

EXECUTIVE SUMMARY

Geography

Geographically, Bajaur Agency is a strategically located area. It adjoins Malakand Agency on the southeast, Dir District on the northwest, Mohmand Agency on the southwest and Afghanistan on the northwest. Bajaur Agency has an area of 1290 square kilometers. Roughly forty percent of the Agency area is covered by barren mountains and the remaining sixty percent by wide valleys. The valley area is mostly broad, open, and used as agricultural land. The most important plains in Bajaur are those of Nawagai, Loesum, Khar, Jar, Lal and Wara Mamand. Mainly, Bajaur valley is drained by the west-east flowing Bajaur river.

The mean rainfall of this area is around 600 mm per annum. The Agency has cold winters and mild summers.

Administration and Economy

There are two administrative sub-divisions, Khar and Nawagai. Each sub-division consists of three tehsils. The Agency is administratively headed by a Political Agent and an Assistant Political Agent who is in charge of each sub-division. Bajaur Agency was established in 1973 with its headquarters at Khar. Almost all of Bajaur Agency is accessible except Charmang, Barang and Khar Shamozai areas. Even these areas are going to be opened soon because the road network is being extended to these areas.

There are no general indicators that yield information concerning income, employment and migration. Agriculture is probably the main economic activity. Poppy is cultivated as a cash crop over a considerable area in Bajaur Agency. The pressure on scarce land resources has led to considerable migration to the settled areas of Pakistan. The principal bazaars are mainly at Khar, Inayat Kila and Nawagai. The main timber markets are at Raghansand in Khar and Loghara, Lundia and Loi Kharki in Mamund Tehsils. Timber is brought from Afghanistan and sold in Pakistan. Goods arriving from Afghanistan are taxed in Bajaur Agency.

Population

The 1981 Census recorded the Agency's population as 289,206. Bajaur was fourth in terms of population after Orakzai, South Waziristan and Kurram. Bajaur stood second to Orakzai in terms of population density which was 224.2 persons per square kilometer.

The population growth rate is not known. If we use an average growth rate of 3.1%, then population density would be 295 persons per square kilometer and population would have been 380,786 in 1991. According to the 1981 Census, the population below 10 years

of age was 30.3%, which comprised 26.3 percent of the total male and 34.5 percent of the total female population of the Agency.

According to the 1981 Census, the literacy rate was 3.8% in Bajaur Agency. It was 6.2% for males and 1.0% for females. Among the various tehsils, Khar tehsil had the highest literacy rate of 5.84 percent whereas Charmang tehsil had the lowest of 2.52 percent. The overwhelming majority of the population of Bajaur is Sunni Muslims. Utman Khel is the largest tribal group in Bajaur whereas Salarzai is the dominant tribe in the Agency.

Refugees

Bajaur Agency has the second largest Afghan refugee population (194,580) after Kurram Agency (347,848) in the Tribal Areas. As of October 1991, there were 25 refugee camps in Bajaur. Afghan refugees have originated from Kuner, Laghman, Parwan, Kundez and Kabul provinces of Afghanistan. These camps are mainly located in Khar, Mamund, Nawagai and Salarzai tehsils of Agency. Registered refugees are provided with flour and edible oil which are available on a somewhat irregular basis. These refugees mainly live in kacha huts and sometimes obtain casual employment in construction or agriculture as laborers. There are 50 schools for refugees with 8372 students enrolled in 1991. There are 14 Basic Health Units (BHU) and one Sub-Health Unit for refugees. Refugees are also provided technical training in electrical work, tailoring, wood working and auto repair in the Government Vocational Institute Inayat Kilay. All these schools, health centers and technical training programs are managed by the Commissionerate of Afghan refugees. According to the Commissionerate, 788 families had returned to Afghanistan up to 1991.

Land Use and Agriculture

The cultivated area accounts for 43 percent of the total reported area of this Agency; no other tribal agency has such a high intensity of land use. The tehsils of Khar, Mamund, Utmankhel, and Salarzai account for the bulk of the Agency's cultivated area. The amount of culturable waste land is small and rather negligible, but there are good prospects of increasing agricultural production on the existing cultivated land by adopting improved agricultural practices and inputs. More and better irrigation facilities can rapidly improve the situation further. The farm size is small - 3.5 hectares (1980 census), but larger than those of any other tribal agency. In 1980, as many as 35% of the farms were less than two hectares in size, and they accounted for only 12 percent of the area under all farms. On the other extreme, a mere one percent of the farms of 20 hectares or more accounted for as much as 8 percent of the total farm area.

Self cultivation is the dominant mode of cultivation, followed by owner-cum-tenant farming. In 1980 these two modes accounted for 64% and 23% of the farms respectively. Of the tenanted farms, the 50:50 produce sharing system is the most dominant one.

Wheat is the major crop cultivated, followed by barley accounting for 43% and 35% of the cultivated area respectively during 1985-90. Both these crops, however, occupied a lesser proportion of the cultivated area during 1985-90 as compared to 1975-80. Maize, rice, rape and mustard, and masoor are emerging as important crops. Fruit and vegetable farming is becoming popular in the Agency; the trend was set in the mid eighties with the expansion in irrigation facilities. The Agency exports rice, masoor, citrus fruit, and rape and mustard. It imports wheat flour, some vegetables, and cooking oil.

The use of farm machinery is increasing rapidly. Most farmers use tractors, and many use threshers. Improved seeds are in great demand, but use is limited due to non-availability. Most farmers use chemical fertilizers, but not in the correct dosages.

The Agriculture Department has been disseminating knowledge about improved inputs and practices. Demonstration plots, the subsidized sale of spray pumps, the supply of fruit nursery plants and insecticides, as well as individual advice are among the services provided to the farmers. The farmers, however, expect the Agriculture Department to provide these services more extensively. Simultaneously, there is a need to supply the improved inputs which are publicized and in demand, at fair prices, in the right quantity, and at the right time. The adequate strengthening of agricultural services can produce positive and timely results in the agricultural sector of this Agency.

Water Resource Management

The improvement and development of surface and ground water irrigation schemes are undertaken by the FATA Development Corporation (FATA-DC). There has been some investment of funds in improving the Agency irrigation facilities, but unfortunately, there has been no comparable investment in agriculture. The improvement of surface schemes or construction of new schemes has been undertaken at 6 sites and are expected to irrigate 1040 hectares of land. Since 1973, ten irrigation schemes have been completed which irrigate 2560 hectares of land.

The FATA-DC has drilled 110 tubewells in the Bajaur plains which irrigate 5908 hectares of land. The 30 new, on-going schemes are expected to irrigate an additional 3300 acres of land. The irrigation of land by ground water comprises 50 percent of all irrigation resources.

Small dams have not been constructed as yet, due to the non-availability of a hydrological data-base for Bajaur Agency.

Animal Husbandry

Based on figures produced by the livestock Census conducted in 1986, there were 85 cattle, 12 buffaloes, 58 sheep, 48 goats, 9 asses and 560 poultry per square kilometer in Bajaur Agency. Afghan refugee-owned animals are not included in this count. The Agency has one veterinary hospital, fourteen veterinary dispensaries and five veterinary centers. These facilities are served by two veterinary officers, sixteen veterinary compounders, seven stock assistants and two inseminators.

Vaccinations are an important part of the work of these facilities, although the data provided by the department indicates that the level of effort is low and shows a declining trend. Not enough effort has been made to improve the nutritional status of the animals. The number of artificial inseminations increased from 2591 in 1988-89 to 2899 in 1989-90. Bajaur appears to be more successful with insemination than some other Agencies.

Forestry

As in most of FATA, deforestation and consequent soil erosion are serious problems. There are sizeable forests in seven areas of the Agency, but four have been seriously affected by deforestation. These areas have become deforested due to drought, over grazing, and cutting of logs legally and illegally. The Forestry Department staff consists of one Forester at each of the four nurseries. Each Forester is responsible for at least five to seven block plantations as well as Forestry Guards for each nursery and block plantation. The department has established block plantations on its own land as well as on privately owned land.

The sericulture department manages one mulberry nursery in the Agency. The nursery was established in 1883 at Khar. The sericulture staff are responsible for the propagation and distribution of mulberry plants and silk seed. In 1990-91, 300 seed packets were distributed to farmers. The department also distributed 40,000 plants at a rate of 10 paisas each. Out of approximately 3000 kg of dry cocoons, the department bought about 250 kg of dry silk cocoons while farmers sold the remaining cocoons to private dealers.

Communications

The Communications and Works (C&W) Department has reportedly completed 126.81 kilometers of paved road and 66.9 kilometers of shingled roads in the Agency up to May 1990. There are two entry points to Bajaur. One is from Peshawar through Warsak road

crossing Mohmand Agency and entering Bajaur at Nawagai. The second is through District Dir entering Bajaur at Mundan. These two entry points are connected within the Agency through a 47.29 kilometer long Munda-Khar-Nawagai Road. Mamund and Salarzai areas are well connected through blacktopped roads while Charmang and Chamarkand areas are poorly connected with shingled roads. There is no airport in the Agency.

There is one Public Telephone Exchange with 500 lines, one Telegraph Office and one Post Office at Khar.

Education

The primary education participation rate is roughly 4 percent for females and 66 percent for males in Bajaur. The participation rate has been calculated by using 1981 Census data and a 3.1 percent per annual population growth rate. These participation rates are higher than in Kurram, South Waziristan, North Waziristan and Orakzai Agencies. Bajaur Agency has a higher boys' primary school enrollment than the other four Agencies, except for Orakzai Agency, despite the fact that it has fewer schools. This also explains the reason why most of the primary schools are overcrowded in Bajaur. The middle school participation rate for eligible females from age 10-14 is negligible. The rate for males for 1990-91 is 15 percent.

There are 15 secondary schools in Bajaur for boys and one for girls. The approximate participation rate of eligible female children ages 15-19 in secondary classes is negligible, while the rate for male students was 4 percent in 1990-91. There are 5 Mohallah, 13 Mosque schools, and four Adult Literacy Centers in Bajaur Agency. There are also two public schools in the Agency. There are six industrial homes. There is one degree college and two technical training institutes for boys.

The main concentration of educational activities is in Khar sub-division.

Health

While a network of 30 facilities of different kinds exists, it is difficult to speak of a functioning referral system being in place. Almost all referrals from lower level facilities are to Khar Civil Headquarters Hospital and to physicians and hospitals in Peshawar. Although a significant number of facilities are equipped for in patients except for the Civil Headquarters Hospital at Khar, not a single facility admits patients. A large number of Basic Health Units are not assigned physicians.

There are no female physicians working at any Agency facility and most facilities are not assigned trained midwives. The difficulty

of recruiting female practitioners adversely effects the quality of care for women in the Agency.

There are only three fixed EPI centers. Outreach teams working from these three centers have limited effects because transportation has not been fully provided. There is also one mobile team working in the Agency.

Electrification

As of August 1991, WAPDA had provided electricity to 75 percent of the Bajaur Agency villages. One 66 KV grid at Khar supplies electricity to Bajaur. There are 11675 legal domestic connections in addition to the same number of illegal connections. There are also 1492 commercial, 160 industrial and 133 tubewell connections in the Agency.

Electricity charges are highly subsidized. Even the low, flat rate charges of rupees 90 per domestic connection are not paid by consumers. Recovery is difficult and often made through the Political authorities.

Investment in Development

Bajaur Agency ranks fourth among all Agencies in terms of total allocations from 1972 to 1992-93. In 1974-75, schemes were started in the agriculture, communications, health, education, housing and irrigation sectors. After that, schemes were gradually initiated in the power, industry and rural development sectors. Initial investment allocations in 1974-75 were 24 million rupees which rose to 77 million rupees in 1992-93.

In the infrastructure development sectors such as power and communications, allocations gradually increased over time. In the basic human needs categories, such as education, health and potable water, allocations rose considerably from a very low base over a 15-year period. In the irrigation sector, allocations increased but in the agriculture and rural development sectors, allocations remained constant for many years despite inflation. This shows that the agriculture and rural development sectors are not a government priority in this Agency.

I. GEOGRAPHY

A. Topography

The well known Northern-Western Himalayan Zone is physically the most formidable and inaccessible of all the areas of Northwest Frontier Province (NWFP). This region includes three NWFP districts, Dir, Swat and Chitral, along with three Agencies, Bajaur, Mohmand and the adjacent Malakand. The most impressive feature of this zone is the towering Hindukush range, which merges with Afghanistan's Wakhan area, known as the roof of the world corridor.

The highest elevation in the NWFP is found in this area. Lesser ranges extend southward from the Hindukush and divide several river valleys formed by the Chitral, Kunhar, Swat, Panjkora and Indus rivers.

The great Hindukush mountain range spreads over 200 miles across the northern extremities of Chitral District. It runs west and south, separating the valleys, though some authorities such as Holdich *[1], considered that it spreads as far south as to include even the Koh-e-Safed.

The character of the northern and western hill tracts wherein lie the Tribal Agencies, inhabited by different Pukhtoon tribesmen, is even more varied and different than that of the Trans-Indus districts in their language, customs, and features.

Bajaur Agency has an area of 1290 square km. It falls in the western tip of Kohistan, North-Western Himalayan zone, running roughly east-west, following the course of Bajaur river. The area lies between latitudes 34° 36' to 34° 56' North and longitudes 70° 15' to 71° 35' East. The area is connected to Dir District from the east through Khar-Munda road and in the west through Khar-Nawagai road which passes on to Mohmand Agency. The broad amphitheatric valley of Khar is bordered by Afghanistan in the north and west, Dir District in the east and Mohmand Agency in the south.

*[1] T. Holdich Geology of the NWFP (Geography-Journal) Vol XVII, No.5, May 1901, P.3

The Bajaur and Mohmand hills of this northern region can be considered as a transition zone. This zone lies between the towering mountains of the Hindukush, with their off shoots, extending on the south from Khyber and northward to the valley of the Jandul River in Dir. The grim looking Mohmand and Bajaur hills, run parallel to the NWFP Province in the north-east and southwest directions. On the one hand, these hills present a rather bold outline to the Peshawar Basin, with their relatively low average elevation of 1120 m, between the Loesum, Jandul and Swat Rivers. On the other hand, there are higher mountains which rise in altitude in a northwestern to western direction from Khar to the Afghanistan border. The altitude varies from about 915 m above the mean sea level to 3060 m. Lawatai at 3060 m, receives some snow in the winter and is the prominent peak in the area.

Totiano Kandao, Alinagar along with Kaga, Mukha, Ghakhai Kandao and Nawa Pass, are some of the small high-altitude passes which serve as communication routes to Afghanistan. For the most part, the region is exceedingly wild. The main topographic feature is an endless maze of dry ravines, flanked by row upon row of rocky hills and mountains which make up around forty percent of the total area. The adjacent Mohmand hills, are completely devoid of any thing but the most drought resistant species of vegetation, and present all the aspects of a true desert region. Bajaur, on the other hand has some diminishing forests in its difficult terrain in the north and northwest as well as those of Kemoor in the south.

B. Important Plans

In Bajaur, the remaining sixty percent of the land area is comprised of wide valley floors and slightly undulating land and lower slopes of foothills along the margins of the valley. The most important plains in Bajaur are those of Nawagai, Loesum, Khar, Jar, Loe and Wara Mamand, Budan, Shinkot, Khar to Jar and Jar to Munda. The general elevation of these plains varies from 800 m to 1280 m. The area is mostly broad, open and used as agricultural land. The plains are sufficiently fertile and the land is mostly level. Climatic and soil conditions suit cultivation of both Kharif and Rabi crops. However, due to the lack of irrigation facilities, only single season crops like wheat, barley, poppy, and mustard are cultivated.

C. Rivers

The Bajaur valley is drained by the west-east flowing Bajaur River that joins the Jandul River at Mian Kili. Most of the

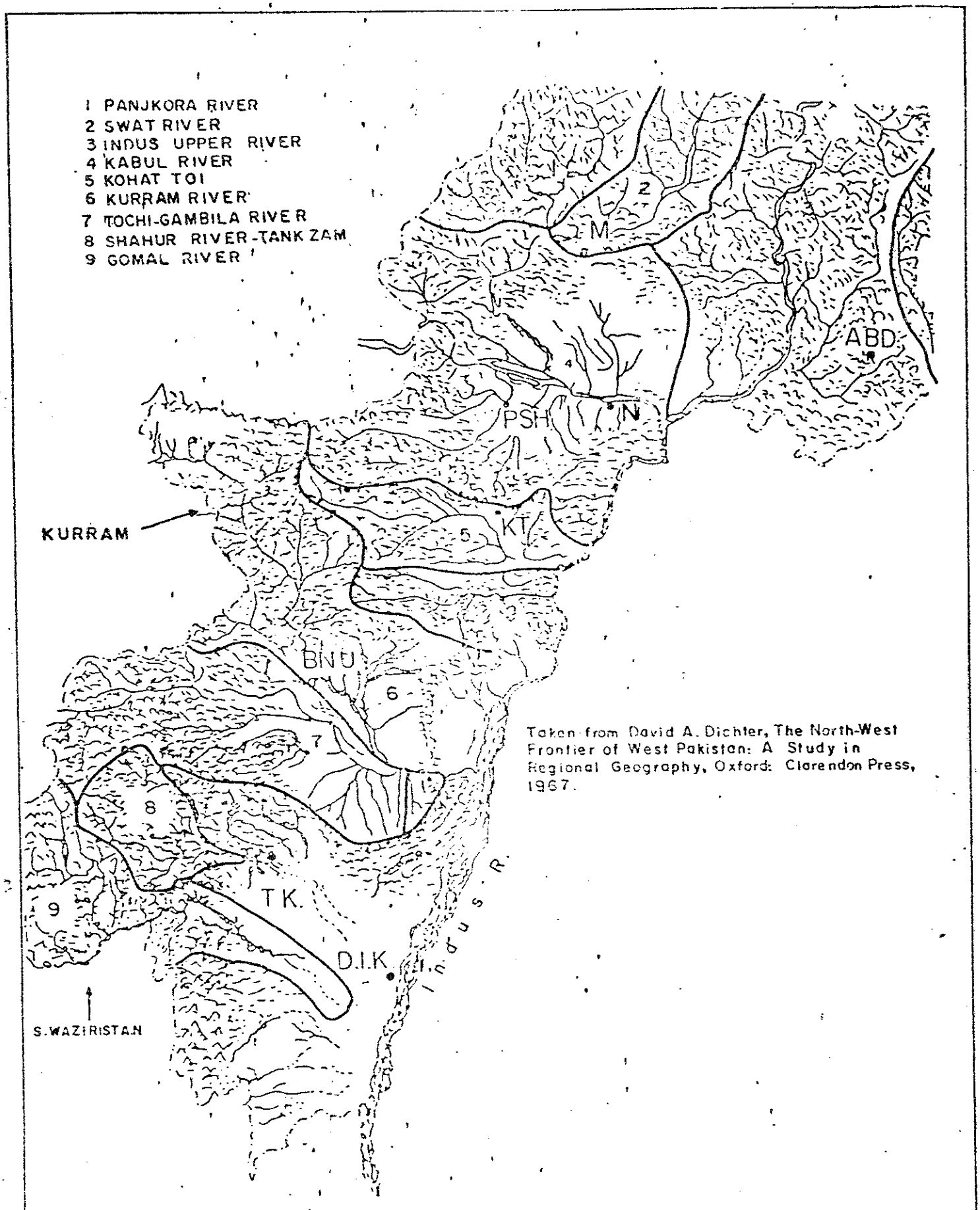
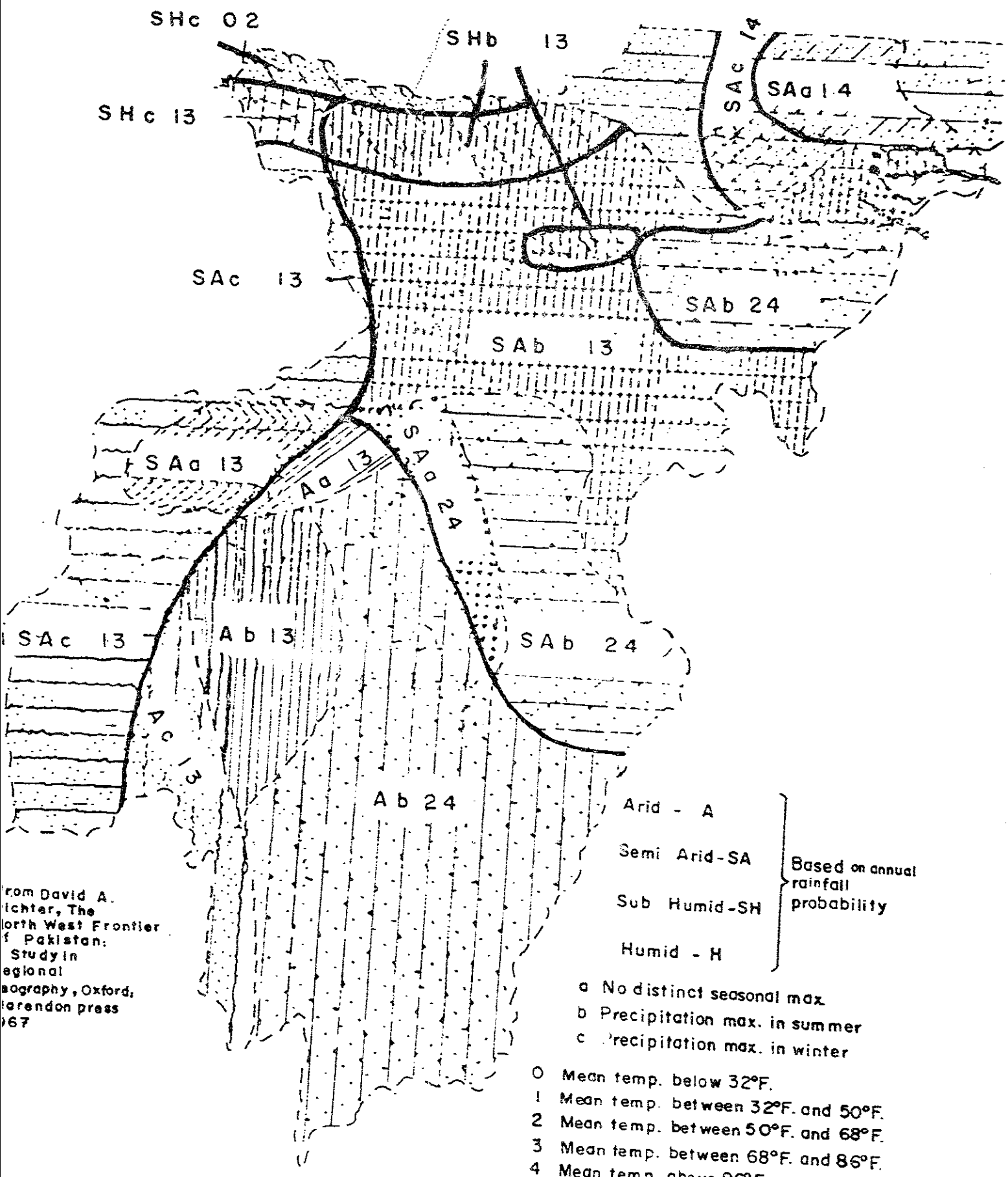


FIG 1.1: The N.W. Frontier: Drainage and main River Systems



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FIG·1-2 CLIMATIC REGIONS IN NWFP.

major tributaries have a northwesterly configuration and have a seasonal flow of water. The Bajaur River in Khar, Babu Kara River in Salarzai, Watalai Khwar in Mamund Tehsil, and Loesum River have some perennial flow of water. Farmers have constructed various channels and diversionary structures from these rivers for irrigation purposes. Where flows are seasonal, like Arang and Barang Nullahs, small check dams and other diversions have been built in many of the nonperennial streams to catch and divert seasonal flows and rainstorm run off. They are unreliable and less frequent than desired. Ground water is extensively available in the valleys. FATA-DC has taken certain steps in this direction. There were 111 operational tubewells in the Agency up to June 1988 which have facilitated irrigation of some portion of the main agricultural land.

D. Climate

No reliable and accurate climatic data is available for Bajaur. However, during the hottest months from May to September, maximum daily temperatures average from 32 to 39 degrees C, and the rate of evaporation is high. Maximum daily temperatures during the three winter months average 18 to 20 degree C. Minimum temperatures fall close to zero during December and January. High frosts are common in the plains, with the severity of frosts and the likelihood of snow increasing in the upper valleys and in the mountains. Temperature data from 1983-84 to 1986-87 is as follows:

Table 1.1

MAXIMUM AND MINIMUM TEMPERATURES (C°) IN BAJAUR AGENCY
1984 - 87

MONTH	1983-84		1984-85		1985-86		1986-87	
	Max	Min	Max	Min	Max	Min	Max	Min
July	38	25	38	25	39	27	39	26
August	30	22	36	27	35	27	29	21
September	30	20	32	21	36	16	38	17
October	28	17	25	20	30	10	34	11
November	24	5	20	15	20	4	26	4
December	20	2	20	2	16	2	17	3
January	14	1	18	5	1[illegible]	2	21	2
February	20	2	12	8	21	6	20	4
March	22	4	NA	NA	26	9	18	8
April	31	5	22	16	29	12	28	13
May	NA	NA	30	23	32	17	30	16
June	38	25	26	17	36	20	38	24

E. Rainfall

Bajaur is located at the extreme end of the Himalayan Range which creates variation and uncertainty in the monsoon rains from month to month and year to year. Neverthless, on account of the peculiar geographical position of the area, Bajaur does get its share of rains with winter and spring rains being more predictable than rains at other times of the year. Rabi crops have a good chance of reaching maturity, but variations in the timing and amount of precipitation create risks and lead to variable yields.

The nearest rain gauge is installed at Amandara, at a distance of more than fifty miles southeast from Khar. Although the figures are not representative, they suggest that the main agricultural areas in the valleys of Bajaur receive about 600 mm of rainfall per annum. There are two distinct seasons in Bajaur Agency:

- Rabi or Winter season:
  In this season there is about 290 mm of rainfall from December to April.

- Kharif or monsoon season:
  In this season there is about 230 mm of rainfall from July to September.

In the remaining months, rainfall is light, unreliable, and annual fluctuations occur widely. Droughts are common.

Table 1.2 shows actual rainfall from 1983-84 to 1986-87.

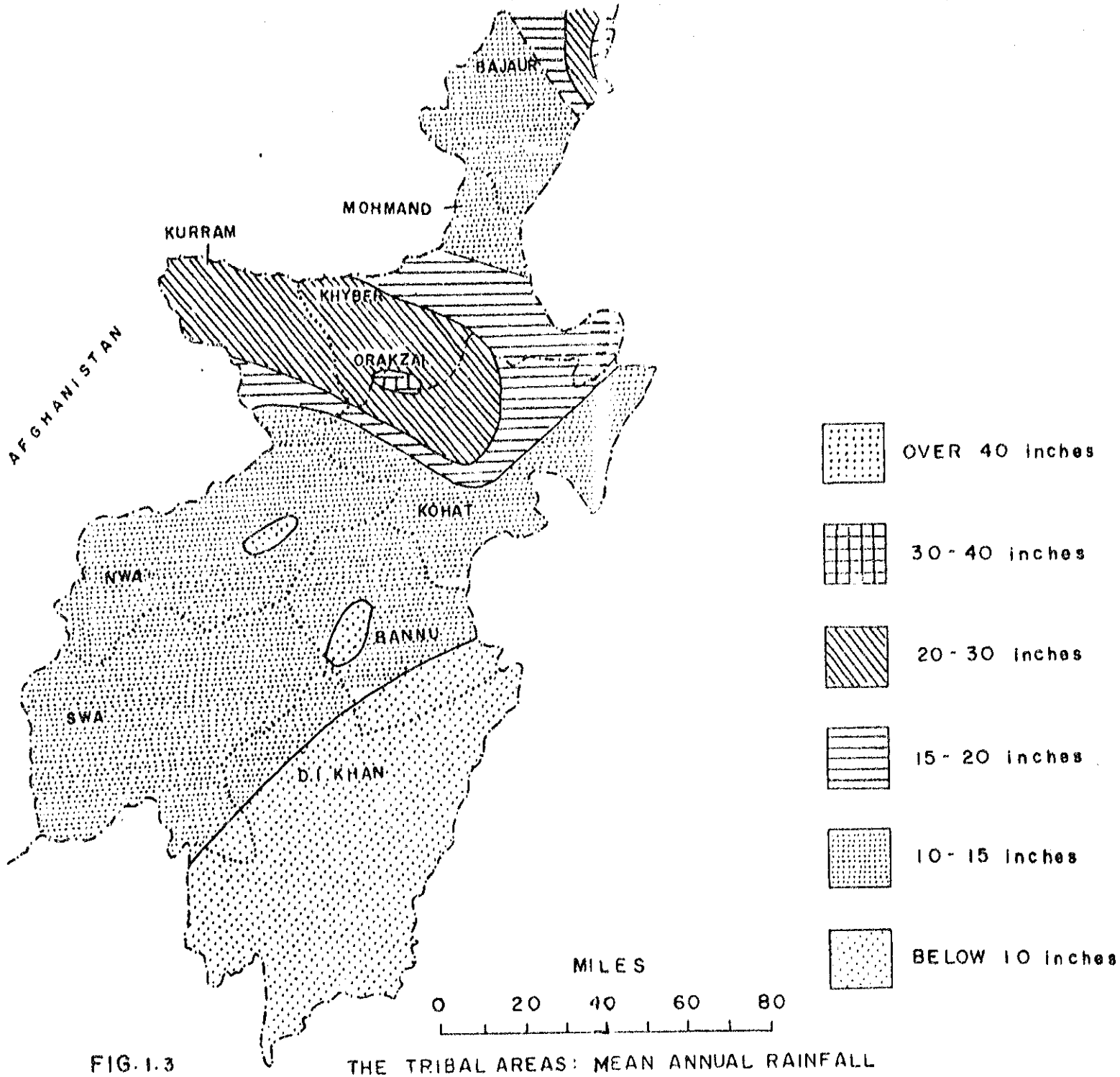


FIG. 1.3 THE TRIBAL AREAS: MEAN ANNUAL RAINFALL

Taken from David A. Dichter, The North-West Frontier of West Pakistan: A Study

Table 1.2

MONTHLY RAINFALL - BAJAUR AGENCY
1984 - 1987

MONTH	1983-84 mm	1984-85 mm	1985-86 mm	1986-87 mm
July	45.0	83.0	55.0	169.0
August	75.0	134.0	95.0	145.0
September	90.0	100.5	5.0	50.0
October	12.0	14.0	20.0	25.0
November	NA	15.0	28.0	81.0
December	15.0	10.0	108.0	25.0
January	13.0	15.0	27.0	113.0
February	50.0	2.0	86.0	8.0
March	70.0	NA	151.0	86.0
April	141.0	44.0	44.0	54.0
May	5.0	10.5	29.0	75.0
June	5.0	34.5	31.0	20.0
Total:	521.0	463.0	679.0	851.0

F. Geology/Minerals

Bajaur Agency is mostly composed of metasedimentary rocks, mainly schists and slates of the Nawagai group, which extend into Mohmand and westward into Afghanistan. Igneous rocks are also found, which are mainly diorite and granite. Volcanic rocks are exposed along the southern and western borders of the Agency. The metasedimentary rocks are mainly Paleozoic, and the granites and diorites are Mesozoic-Tertiary.

Nawagai Limestone lies to the southwest. The pelitic sediments, include amphibolites, epidote chlorite schists, piemontite schists, talc carbonate schists, graphite schists and slates. Extensive distribution of garnet schists is observed in the Shamozai area, lying to the southeast of the Agency. The southwestern part of the area is basically igneous and metamorphic in nature, but some limestone and dolomite also exist.

Garnet schists are abundantly exposed to the southeast and constitute the main divide of Arang and Barang-Shamozai area. Limestone and dolomite, besides constituting a unit in the southeast, also occur as lenses and pockets in the metasediments. Quartz veins and pegmatite bodies, probably both of igneous and metamorphic origin, exist sparsely throughout the area. A few hydrothermal quartz veins at Gabarai and Inayat Kili bear copper mineralization. Some manganese mineralization is present at Ashghar-Charmung. At

certain places in Nawagai area, Ambhar Utman Khel and Targhao, low to medium commercial grade soapstone exists in the chloritic schist. The talcosic schist in the Aman Kot area of Barang bears low to medium quality emerald mineralization. Some transported boulders and pebbles of ultramafics carry stringers and veins of chromite. Huge deposits of white marble exist in the hills exposed to the north of Gumbatai. Workable deposits of green zebra marble (carbonate chlorite schist) exist at Pampokha.

All these mineral resources no doubt have their own commercial value, but no effort has been made either to ascertain the extent of such deposits or to carry out any large scale exploitation.

Table 1.3

LOCATION OF MINERALS IN BAJAUR AGENCY

Minerals/Rocks	Locations
Schists and Slates	Nawagai, extend into Mohmand Agency and westward to Afghanistan.
Limestone	To the southwest of Nawagai
Amphibolities, Epidote, Chlorite Schists, Piemontite Schists, Talc Carbonate Schists, Graphite Schists, Slates	Shamozai area, lying to the south and east of Bajaur Agency
Garnet Schists, Domomite	Southeast of the Agency
Quartz Veins and Pegmatite	Throughout the Agency
Hydrothermal Quartz Veins	Gabarai
Maganese	Asghar, Charmung
Low grade Soapstone	Nawagai, Ambhar Utmankhel and Targhao
Talcosic Schist and low/ medium quality Emerald	Aman Kot area of barang Tehsil
Magnetite	Northwest of Gumbatai
White Marble	North of Gumbatai
Green Zebra Marble	Pampokha

G. SOILS

From the agricultural point of view, medium textured soils are known to be the best. These soils are found in all parts of the central plain of Bajaur Agency. The soil depth of this valley is 15 feet on the average, although it varies in some places. Generally the soil profile is visible along the left and right bank of the Bajaur Khawar.

The southern mountains are mostly bare or with very thin skeletal soils. These soils are covered with poor grass and shrubs. Deforestation on these mountains is aggravating the erosion of fertile soils from Bajaur Agency.

Torrents of water create errosion which deposit coarse materials at the foot of the mountain's slope. At Munda, which is the exit point of Bajaur Agency, the soil particles are fine in size, heavy in texture and less drainable.

The upper and middle valleys of Bajaur Agency consist of silty clay loam which is generally drainable. Field tests were not made to find out the permeability of these soils, which is essential both for ground water reservoirs and crop water requirements.

The upper southwestern portion of Bajaur Agency is composed of gulled land, severely eroded due to the excessive slope of the mountains towards the Bajaur khawar which drains the valley.

Although there is a wide range of soil types, over 60 percent of the area ranges from moderately coarse to medium fine in soil texture. All these soils are suitable for irrigation from a textural standpoint and can produce very good crop yields if managed properly. The northern portion of Bajaur Agency consisting of Charmang, Mamund and Salarzai plains have milder slopes towards the center of Watalai and Babukara River, draining the northern portion of Bajaur Agency. These soils are mildly eroded and have moderate textures.

Generally, all soil in Bajaur Agency is considered to be drainable. The irrigation system will not pose any problem for water logging and salinity because of the deep water table in the area and the exfiltration of the ground water surplus flow to the main stream through gravel beds.

II. ADMINISTRATION AND ECONOMY

A. Administration

Geographically, Bajaur Agency is a strategically located area. It adjoins Malakand Agency on the southeast, Dir district on the northeast, Mohmand Agency on the southwest and Afghanistan on the northwest.

Prior to 1960, Bajaur almost remained a semi-independent territory and was being treated as an inaccessible area under the political jurisdiction of the Political Agent, Malakand. The whole area was divided among various Khans, i.e. the Khan of Khar, the Khan of Nawagai and the Khan of Pashat, etc. In 1960, Bajaur was declared as a subdivision of Malakand Agency and an Assistant Political Agent was appointed with his headquarters at Munda in the Dir District. Bajaur was declared a Federally Administered Tribal Agency in December 1973.

The Agency administration is headed by a Political Agent based at Khar, the headquarters of the Agency. The Agency has been divided into two subdivisions:

Subdivisions	**Tehsils**
Khar	Khar Salarzai Utman Khel
Nawagai	Nawagai Mamund Barang Chamarkand

Each subdivision is headed by an Assistant Political Agent, while a Political Tehsildar is in charge of each Tehsil. For small sized tehsils, the Political Naib Tehsildar is in charge. Salarzai, Utman Khel, Nawagai and Barang tehsils are small in area so Naib Tehsildars are in charge of these. Khar, Mamund and Chamarkand tehsils are headed by Tehsildars. The Political Agent has a staff of one superintendent, two stenographers and a few clerks. Assistant Political Agents (APA) usually have a staff consisting of a reader, a stenographer and political muharars, while Tehsildars are supported by a few clerks.

Charmang, Barang and Khar Shamozai areas are inaccessible except from Agency areas. These areas are going to be opened soon because the road network is being extended to these areas.

B. Economy

There are no general indicators that can help us gain a sense of Agency productivity, the contribution of various sectors to productivity, remittances, employment, the economic impact of refugees, or income. Estimates made of agricultural production are problematic and may understate or overstate true production.

Agriculture is probably the most important source of income for the vast majority of inhabitants. Wherever there are large landholdings, landless peasants work as tenants and in small holdings, owners earn a subsistence living. According to the Narcotics Affairs Section (NAS) of the US Embassy, Islamabad, an estimated 6000 to 6500 acres of land in Bajaur Agency was under poppy cultivation in 1990-91. Poppy is used as a cash crop by farmers. People do have livestock but do not raise animals on a commercial basis because animals are kept largely for family use.

Enlisting in the militia or army as a source of employment is also very limited. Short-term unskilled employment on development projects (roads, irrigation systems etc.) and long-term employment as chowkidars on some schemes has become important. There are some commercial mining operations in Nawagai which are a source of some employment for locals.

An oil expelling and refining plant was completed by FATA-DC at Inayat Kalay at a cost of 19.72 million rupees in 1986. It was supposed to extract oil from oil seed produced in Bajaur Agency. Even after completion, the factory was not started; the reason forwarded for its closure was possible future operational losses. Another reason put forth for the closure was the low production of oil seed due to the changed cropping patterns of growing wheat, maize, barley etc. This coincided with other units of FATA-DC being closed because of losses. At a later date, some private parties attempted to get the factory operational through a lease, but an agreement could not be reached with FATA-DC. This unit could have generated 150 direct and many other indirect jobs for locals.

A limited number of Bajaur residents have gone to the Gulf for employment. No data is available concerning the amount of remittances coming in to the Agency annually. Many of those who can no longer emigrate abroad for work choose to go to Peshawar or Karachi or another major city in Pakistan. They

generally work as laborers in these cities. The remittances earned in Pakistan, however, are substantially lower than those earned overseas.

There are three main bazaars in Khar, Inayat Kalay and Nawagai in Bajaur Agency. According to a survey conducted by UNHCR in 1989, there were 591 shops in Khar bazaar out of which 245 shops belonged to Afghan refugees and 346 to locals. In the same way, Inayat Kalay bazaar had 518 shops, out of which 362 belonged to Afghan refugees and 156 to locals. Most of the shops sell items of everyday consumption. There are also some arms and ammunition shops. There are four main timber markets in Bajaur Agency. One is in Raghasand in Khar and three at Loghara, Lundia and Loi Kharkai in Mamund Tehsil. Timber is brought from Afghanistan and sold in Pakistan.

All goods brought from Afghanistan are taxed in the Agency; therefore, they are not treated as smuggled items.

There are six branches of nationalized banks in Bajaur out of which four are located in Khar and one each at Inayat Kalay and Nawagai.

III. POPULATION

A. Government Census Data

According to the 1961 Population Census, the population of Bajaur was estimated at 280,200. Ten years later in 1972, the Census population figures increased by 29.9 percent, to 364,050. In the 1981 population Census, these figures decreased dramatically by 20.6 percent amounting to 289,206 persons, resulting in a minus 2.7 percent rate of average annual growth, as shown in table III.1.

Table No.III.1.

Population Size, Intercensal Change & Annual Growth of Bajaur Agency

Description	1961	1972	1981	1991 (estimated)
Population	280,200	364,050	289,206	380,786
Intercensal change	-	29.9%	-20.6%	-
Average annual growth rate	-	2.3%	- 2.7%	3.1%

Compared to the other Tribal Agencies, Bajaur was fourth in terms of total population in 1981. Three other highly populated Agencies were Orakzai, South Waziristan and Kurram. Bajaur was second after Orakzai in terms of population density with 224.2 persons per sq. km. Orakzai had a density of 233.3 persons per sq. km. One significant reason for this difference may be that Bajaur Agency has the smallest area (1290 sq. km.) of all the Tribal Agencies.

According to the 1981 Census, Bajaur's population was scattered as follows among the following tehsils:

Table III.2 Population by tehsil

S.No.	Name of Tehsil	Population as of 1981	%age of Agency population
1.	Barang	44,048	15.2 %
2.	Nawagai	34,376	11.9 %
3.	Khar	36,874	12.8 %
4.	Mamund	83,102	28.7 %
5.	Salarzai	62,172	21.5 %
6.	Utman Khel	28,634	9.9 %
7.	Chamarkand	N/A	N/A

Recently a new, small Chamarkand Tehsil comprising only five villages was created for certain administrative and developmental purposes. From the administrative point of view, people of this area are relatively underdeveloped and troublesome. The area is adjacent to the western border of Afghanistan.

Mamund Tehsil is densely populated, with 108 villages and has the largest share of 28.7 % of the Agency population. Salarzai Tehsil is the second largest tehsil with 21.5 % of the total population. Both Mamund and Salarzai Tehsils are comparatively well connected with a road network, which has resulted in safe and convenient access to the various trade and commercial centers of the country.

Barang Tehsil comprising 56 villages, has 15.2 % of the total population, while Utman Khel Tehsil has the remaining 9.9 % of the population share of the Agency. Utman Khel Tehsil is adjacent to Malakand Agency in the east, and Dir district. Most of its population of 72682 is in a relatively disadvantageous position in terms of their socio-economic development.

The average household size was 6.3 persons, which is the lowest average figure among all of the Agencies and Frontier Regions. According to the 1981 Census, the population below 10 years of age was 30.3% which comprises 26.3 % of the total male population and 34.5 % of the female population of the Agency.

The overall sex ratio in the Agency was 104.7 males for every 100 females at the time of the 1981 Census. These figures placed Bajaur Agency fourth among all other agencies, where the male population was greater than the female. The sex ratio in Utman Khel Tehsil was 117.7 males for every 100 females, the highest male ratio among all the tehsils. In Mamund Tehsil, the ration was 99 males per 100 females. The Utman Khel area is one of the most poorly connected and inaccessible areas in terms of communication which has resulted in the extreme, large-scale deprivation of females to available modern health facilities. In addition, the predominant male culture with its conservative attitudes has created inhibitions about consulting male doctors for female patients. These sociological and psychological factors have resulted in the high rate of female mortality.

B. Population Growth

It is very interesting to note that the population in Pakistan as a whole has almost doubled since 1971. Pakistan is the ninth most populous country of the world with its population growing at a rate of around 3 % per annum. It takes twenty three years for the population in Pakistan to double. Nevertheless, the 1981 Population Census showed a negative population growth rate of 1.5 percent for FATA in general and a negative average annual growth rate for Bajaur in particular. The reason given in the preface of the 1981 Census Report was that it was the first time in

FATA that a proper census providing for individual enumeration was carried out. In every previous census of FATA, estimates of population were provided by Political Agents with some insignificant exceptions where individual enumeration was carried out.

There is no doubt that the 1981 Census program was a relatively more organized, scientific and well thought out plan, but its methodology cannot be questioned on the basis of scientific enquiry. Its problems of implementation, however, can't be ruled out. One of the foremost problems in a census of this nature, is accessibility to certain inaccessible areas of the Agencies. As a result, the 1981 Census in the Tribal Areas created more controversies in terms of population data accuracy and reliability than it resolved.

There are other well-established factors which are sufficient to prove that the rate of population growth is greater in the Tribal Areas of Pakistan than in other areas. This includes the immense urge for greater manpower, a symbol of status and strength among the tribesmen, which in turn, leads to early marriages. In addition, the lack of education and knowledge, especially among women, about family planning and the scarcity of family planning services are crucial elements which have contributed to the increase in the population of the tribal people.

It is, of course, a gigantic task to collect accurate and valid up-to-date data about the Tribal Areas. A researcher has no option or alternative but to utilize the available data collected and produced by the governmental agencies. Although the 1981 Census failed to provide a better basis for the future forecasting of population growth, current figures can be extrapolated by using the national 3.1 % annual growth rate. Using this figure, the expected population of Bajaur would have been 380,786 in 1991, with a total increase of 91,580 from 1981. This would also bring the population density within the range of 295 persons per sq.km.

C. Literacy

According to the 1981 Census, the literacy rate was 3.8% in Bajaur Agency. It was 6.2% for males and 1.0% for females.

There were 5,959 persons who had passed the primary and higher levels of education. The overall literacy ratio in FATA was 6.38% in 1981 whereas Bajaur Agency had 3.80%, which was the second lowest ratio after Orakzai Agency (3.03%). Among the various tehsils in Bajaur Agency, Khar Tehsil had the highest literacy rate of 5.84%, whereas Charmang Tehsil had the lowest of 2.52%.

The literacy rates of each tehsil according to the 1981 Census are given in Table III.3.

Table III.3

Literacy of Population 10 Years of Age & Above in 1981

Area	Sex	Total Population	Illiterate	Literate	Literacy Rate
BAJAUR AGENCY	Both Sexes	201,477	193,805	7,672	3.80 %
	Male	108,990	102,249	6,741	6.18 %
	Female	92,487	91,556	931	1.00 %
BARANG TEHSIL	Both Sexes	30,009	28,998	1,011	3.36 %
	Male	16,134	15,285	849	5.26 %
	Female	13,875	13,713	162	1.26 %
CHAR-MANG TEHSIL	Both Sexes	24,069	23,462	607	2.52 %
	Male	12,910	12,454	456	3.53 %
	Female	11,159	11,008	151	1.35 %
KHAR BAJAUR TEHSIL	Both Sexes	25,429	23,945	1,484	5.84 %
	Male	13,497	12,161	1,336	9.90 %
	Female	11,932	11,784	148	1.24 %
MAMUND TEHSIL	Both Sexes	58,898	56,720	2,178	3.70 %
	Male	31,674	29,718	1,956	6.18 %
	Female	27,224	27,002	222	0.82 %
SALAR-ZAI TEHSIL	Both Sexes	44,284	42,698	1,586	3.58 %
	Male	24,093	22,685	1,408	5.84 %
	Female	20,191	20,013	178	0.88 %
UTMAN KHEL TEHSIL	Both Sexes	18,788	17,982	806	4.28 %
	Male	10,682	9,946	736	6.89 %
	Female	8,106	8,036	70	0.86 %

Source: 1981 Population Census.

D. Religion and Tribal Groups

Present day Bajaur Agency is comprised of different valleys, which include Surkamar, Rud, Charmang, Watalai & Babukara valleys. The residents all belong to the powerful and dominant Pukhtoon tribes of Tarkalanri and Yousafzai origin who entered the area about the end of the sixteenth century. The valleys' inhabitants are as diversified and intractable in origin as the terrain itself.

The dominant tribe of Bajaur Agency is the Salarzai branch of the Tarkalanri tribe which is divided into different clans. The ruling family of Ibrahim Khel and Bram Khel (Khan Khel) belongs to the Salarzai tribe. Most of the land in Khar, Jar, Raghagan, Loesum, Pashat and Babukara areas still belongs to these Khans. Bajaur today is different from the past when the whole tribe acknowledged allegiance to one ruling family, of whom Safdar Khan, the Khan of Nawagai, is the lineal descendant. Owing to the dissension in the tribe, the power of the former ruling chief has in the course of time diminished.

The Charmang and Babukara valleys are occupied by the Salarzai, and the Watali by Mamund Tarkalanris. The Rud valley of the Bajaur Agency is inhabited by a heterogeneous mixture of Tarkalanri, Mohmands, Safis, Utmankhel and others.

The Mamunds of Watalai valley and Salarzais of the Charmang valley nominally acknowledge the Khan of Nawagai as their Tarkalanri Chief. Occasional land disputes are the major bone of contention among the various clans and tribes. An attempt to upset their allegiances among these rival Khans has been responsible for much of the trouble for which Bajaur has traditionally been known.

The Utman Khel are Sarbani Pathan, the largest group in Bajaur; they are an offshoot of the Yusufzai tribe, one of the largest and oldest of the Pukhtoon tribes. The Yusafzai as a whole may be roughly divided into hilly area and plain area inhabitants. The former live in Dir, Swat, Buner, and parts of Bajaur. The group living in the hills is more properly the true Yusufzai, but they are known more usually by their various clan names. They have always maintained complete independence, and pay tribute to no one. Their area is a network of bare hills and unfertile land.

The Syeds and Mians are also of significant influence and belong to the landed aristocracy of the area. The Safis and the Mashwanis Tribes are also inhabitants of the Agency but are mostly landless peasants of the Khans. Although the overwhelming majority of the population of Bajaur is almost entirely Muslim, the 1981 population Census enumerated an insignificant number of Ahmadis, Christians and Hindus.

IV. REFUGEES

Bajaur Agency has the second largest Afghan refugee population (194,580) after Kurram Agency (347,848) in the Tribal Areas.

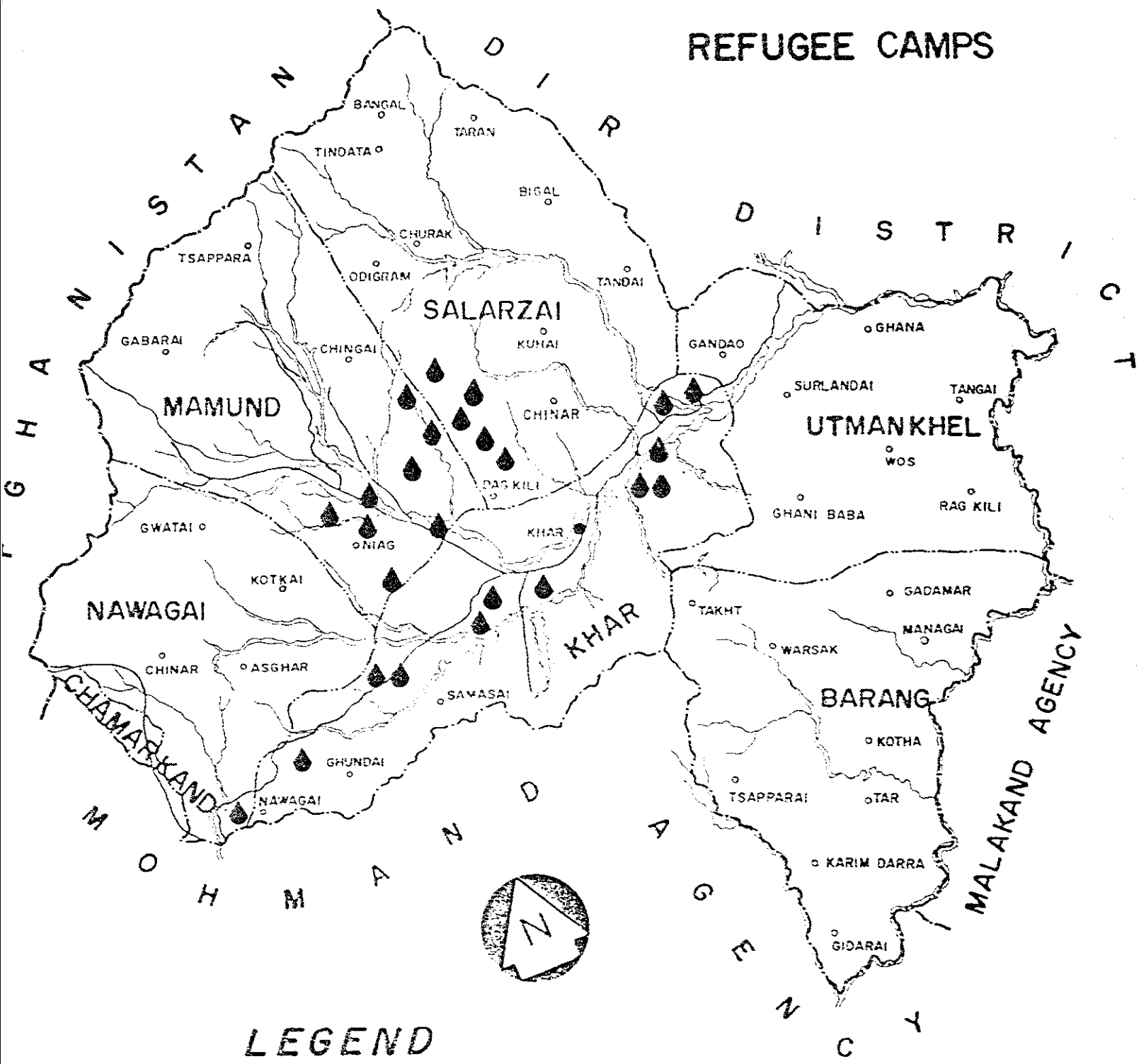
Keeping in mind that Bajaur is the smallest of all the Agencies in terms of area (1290 sq.km.) and has a comparatively high population (375,968 as in the 1981 Census), this large number of refugees is over burdening the Agency's resources. There are twenty five camps in Bajaur with the following population:

Table IV.1 Refugee Camp Population

S.No	Camps	Tehsil	Number of Families	Individuals
1.	Baichina	Khar	657	4522
2.	Damadola No.1	Mamund	1271	9040
3.	Damadola No.2	"	1144	8363
4.	Damadola No.3	"	1268	8701
5.	Damadola No.4	"	1159	7626
6.	Damadola No.5	"	1435	9027
7.	Damadola No.6	Khar	778	5483
8.	Damadola No.7	Mamund	1012	7273
9.	Jehangir Abad	Khar	1328	9151
10.	Kirala	"	1225	8628
11.	Khazana	"	1282	7870
12.	Nawsab Abad	"	814	5251
13.	Nawagai	Nawagai	1693	12585
14.	Raghagan	Salarzai	922	6790
15.	Rashakai-1	Khar	900	6199
16.	Rashakai-2	"	872	6212
17.	Shah Jehan Abad-1	Mamund	1925	14055
18.	Shah Jehan Abad-2	"	1101	7982
19.	Shah Jehan Abad-3	"	999	7104
20.	Shultan	"	923	7200
21.	Umari	"	1242	9324
22.	Yousaf Abad-1	Khar	1420	9398
23.	Yousaf Abad-2	"	825	5889
24.	Yousaf Abad-3	"	644	4243
25.	Zoor Bandar	Nawagai	931	6664
		TOTAL:	27769	194580

MAP # IV.I

BAJAUR AGENCY



LEGEND

- INTERNATIONAL BOUNDARY
- TRIBAL BOUNDARY
- TEHSIL BOUNDARY
- EXISTING PAVED ROAD
- RIVER / STREAM / KHWAR
- AGENCY HEADQUARTER

0 4 8 12 16 KM

Bajaur Agency has a border linked with Kuner province of Afghanistan. Afghan refugees have come to Bajaur Agency from Kuner, Laghman Perwan, Kundez and Kabul provinces of Afghanistan.

The number of persons coming from these provinces is given in Table IV.2.

Table IV.2 The Refugee Population by Province

S.No	Provinces of Afghanistan	Number of Families	Individuals
1.	Kunar	26,081	182,565
2.	Perwan	103	668
3.	Laghman	33	307
4.	Kundez	1,668	11,637
5.	Kabul	5	33

In addition, there are an estimated 290 unregistered refugee families in Bajaur Agency.

Some of the Bajaur tribes live on both sides of the Pak-Afghan border. The type of tribes to which refugees belong is given in Table IV.3 along with the number of families.

Table IV.3 The Refugee Population by Tribe

S.No	Tribes	Number of Families
1.	Mamund	9196
2.	Safi	7462
3.	Shinwari	5228
4.	Salarzai	2298
5.	Degan	2066
6.	[illegible]ar	737
7.	[illegible]wani	223
8.	[illegible]mand	355
9.	L[illegible]mani	31
10.	Kanyastani	105

Individual registered refugees are provided with flour and edible oil on an irregular basis. Because of declining foreign assistance, sugar, cloth and the maintenance allowance have been cut. The supply of kerosine has become erratic.

According to the Commissionerate of Afghan refugees, 788 families have returned to Afghanistan up to September 1991.

Some schools are in operation for Afghan refugees and managed by the Commissionerate. The type of schools, enrollment and type of construction is given in Table IV.4.

Table IV.4 Number of Schools for Afghan Refugees

S.No	Type of Schools	Number of Schools	Enrollment in 1991	Type of Construction
1.	Secondary school	1	118	Concrete
2.	Middle schools	14	3489	Katcha
3.	Primary schools for boys	29	4249	Katcha
4.	Primary schools for girls	6	516	Katcha

There are 14 Basic Health Units (BHU) for refugees out of which 5 have concrete construction and 9 katcha. There is also one Sub Health Unit (SHU) which is also operating in a katcha building.

A skill development program for refugees has been in operation at the Government Vocational Institute, Inayat Kalay. Refugees are provided training in electrical work, tailoring, wood working and auto repair. There were 63 students enrolled in this program in the winter of 1991. This program is managed by the Commissionerate of Afghan refugees.

V. LAND USE

The study of land use in Bajaur Agency is presented in two parts. First, a global view of the Agency as a whole is presented followed by data by tehsil. In the following sections, farm-level data reported by the Pakistan Census of Agriculture, 1980, is presented. The two estimates may not necessarily be comparable, but combined, they will help indicate land utilisation patterns and the potential of the area.

A. Global View

The total geographic area of the Agency is 150,800 hectares out of which land utilisation statistics are available for only 129,035 hectares. These are given in Table V.1.

Table V.1

LAND USE IN BAJAUR AGENCY
1989-90

Land use classification	Area	
	Hectares	% of Total
1. Cultivated area	56,000	43.40
2. Culturable waste	3,120	2.42
3. Forest	1,173	0.91
4. Not available for cultivation	68,742	53.27
5. Total reported area	129,035	100.00

Source:- FATA, Agriculture Department.

Another estimate supplied by the E.A.D.A Bajaur office provides quite a different composition of land use. It puts the cultivated area at 90,334 hectares which is close to the 1980 Agriculture Census estimate of 87,585 hectares (see Table V.3). Since the basis for this estimate is unknown, this will not be considered in the analysis.

B. Land Use by Tehsil

Land use data by tehsil as provided by the Agriculture Department, Khar/Bajaur, is given in Table V.2.

Table V.2

LAND UTILISATION IN THE TEHSILS OF BAJAUR AGENCY

(Hectares)

Tehsil	Reported area	Cultivated	Culturable waste	Forests	Not available for cultivation
1. Khar	23,830	11,600	600	128	11,502
2. Nawagai	22,745	8,850	618	100	13,177
3. Mamund	25,050	11,240	425	300	13,085
4. Salarzai	22,000	9,590	350	350	11,710
5. Utmankhel	19,435	9,050	500	80	9,805
6. Barang	15,975	5,170	627	170	10,008
Total Hect.	129,035	55,500	3,120	1,128	69,287
% age	(100.00)	(43.01)	(2.42)	(0.87)	(53.70)

Source: DADA Office, Khar, Bajaur.

Khar, Mamund, and Utmankhel are relatively better placed than the other tehsils in respect to cultivated land. These are the leading agricultural regions of the Agency not only in terms of acreage, but also crop yields.

C. Land Use in 1980: Agriculture Census Estimate

According to the 1980 Census of Agriculture, there were 25,039 private farms in Bajaur Agency with a total area of 88,673 hectares. This area was allocated to the uses as shown in Table V.3.

Table- V.3

LAND USE IN BAJAUR IN 1980

Land use	Area	
	Hectares	% age
1. Cultivated area	87,585	98.77
2. Culturable waste	785	0.89
3. Unculturable area including forests	303	0.34
4. Total	88,673	100.00

Source: Pakistan Census of Agriculture, 1980.

The 1980 Agriculture Census based land use pattern is, strictly speaking, not comparable with the statistics given in Table V.1. The Census was addressed to farms which were operational for agricultural purposes, whereas Table V.1 takes into account all reported land, resulting quite understandably, in a lower percentage of cultivated area.

D. Land Use Patterns During 1984-85 and 1989-90

An analysis of the change in land use patterns over time is marred by the incomparability of statistics for different years. Although this was undertaken despite flaws in the statistics, some useful insights may possibly be gleaned regarding the direction and significance of change in land utilisation.

Originally the intention was to analyse land use change starting in 1974-75, but data inconsistencies and incomparability prevented that. According to FATA Development Statistics, in 1974-75 and also in 1979-80, the Agency's reported area was 152,005 hectares. In 1984-85 the figure was revised downwards to 129,035 hectares. The mistake in the 1974-75 and 1979-80 data, ostensibly, was that the total "geographic area" was taken as "reported area". In addition, there was a serious error in the figures given in the subheadings. This could, perhaps, be a case of entering data incorrectly. This makes these statistics incomparable with those for 1984-85, so we have to start from the latter year to the exclusion of the earlier period. The comparative data for 1984-85 and 1989-90 is given in Table-V.4.

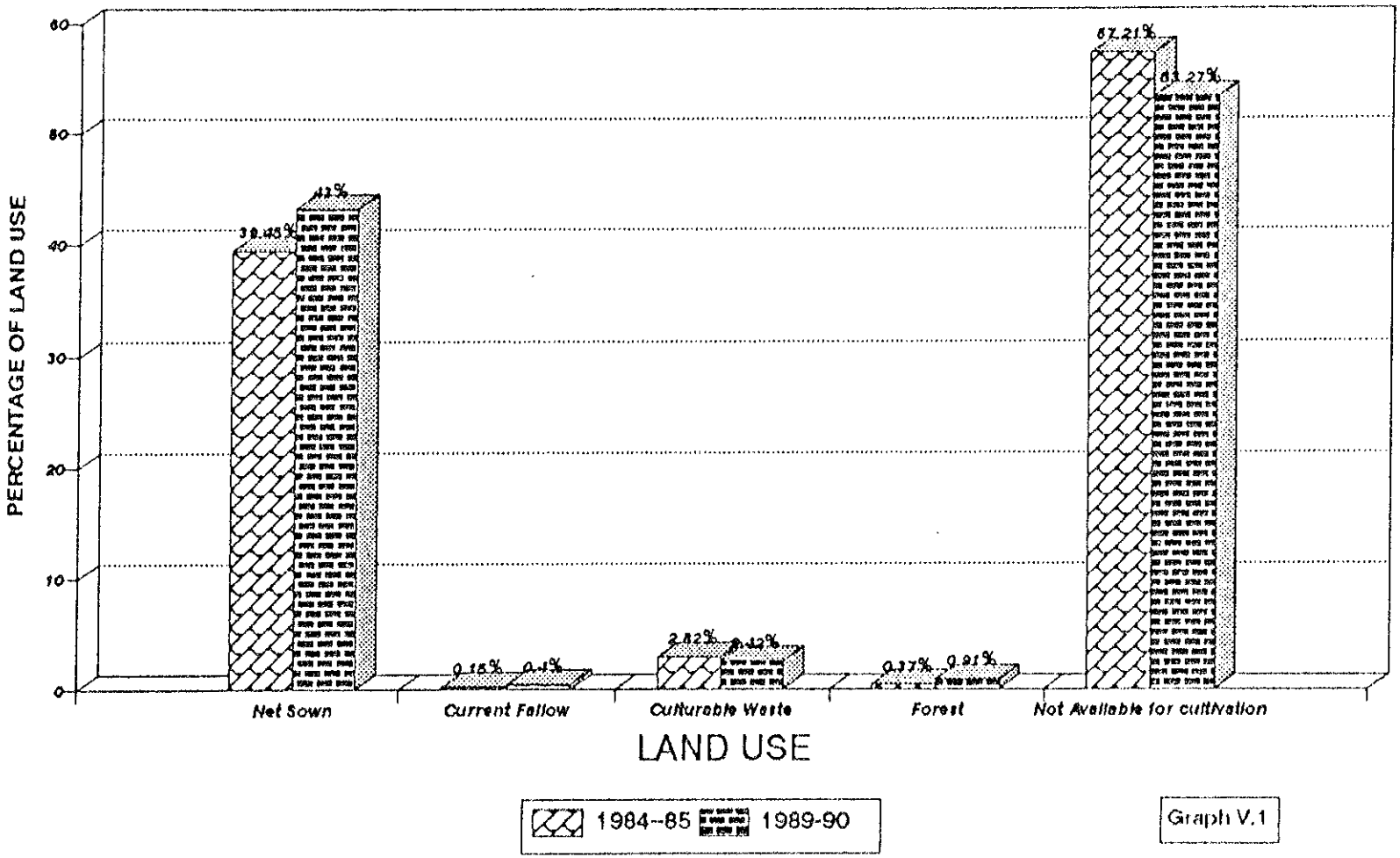
Table-V.4

LAND USE IN BAJAUR AGENCY 1984-85 AND 1989-90

Sr. No.	Land Use	1984-85 Hectares	1984-85 %	1989-90 Hectares	1989-90 %
I	Cultivated Area				
	i. Net sown	50,900	-	55,500	-
	ii. Current fallow	200	-	500	-
	iii. Total	51,100	39.60	56,000	43.40
II	Cropped Area				
	i. Total (=I.i+II.ii)	76,684	-	86,522	-
	ii.Sown more than once	25,784	-	31,022	-
III	Un-Cultivated Area				
	i. Culturable Waste	3,641	2.82	3,120	2.42
	ii. Forest	477	.37	1,173	.91
	iii. Not available for cultivation	73,817	57.21	68,742	53.27
	iv. Total	77,935	(60.40)	73,035	(56.60)
IV	Grand Total= Reported Area	129,035	100.00	129,035	100.00

Source: FATA Agriculture Department.

LAND USE IN BAJAUR AGENCY
1984-85 AND 1989-90



Graph V.1

Land use intensity was 86.43% in 1984-85. It rose to 94.72% in 1989-90. This is a fairly high level. The bulk of the farm area is unirrigated in this Agency yet the cropping intensity is fairly high. It was 150 in 1984-85 and 155 in 1989-90. In order to draw any conclusion about the shape of the farm economy, these statistics need be used in conjunction with other relevant information such as the percentage germination, maturity percentage, plant population per acre, seed rate, etc.

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VI. AGRICULTURE

A. Landholdings

The chief source of information on land holdings in Bajaur Agency is the Pakistan Census of Agriculture conducted in 1980. Despite its several limitations, it provides some good information on various aspects of landholdings in Bajaur Agency. This information may not be adequate for planning purposes, but it does provide a fairly representative profile of landholdings at the introductory level. The aspects covered in this section which are based mainly on the Agriculture Census of 1980, as well as other sources, are: i) farm size pattern, ii) tenure classification of farms, and iii) tenancy systems.

1. Farm Size (1980)

The average size of a farm was 8.7 acres in Bajaur Agency as against the overall corresponding figure of 5.4 acres for all FATA in 1980. The landholding pattern was characterized by a skewed distribution, as also elsewhere in FATA. The summary statistics are given below:

Farm Size (Hect.)	Farm (%)	Farm Area (%)
. under 2.0	35	12
. 2.0-10.0	61	71
. 10.0-20.0	3	9
. 20 & above	1	8

The average farm size in Bajaur Agency was appreciably higher than that in other tribal agencies. The comparative statistics from the 1980 census are given below:

S.No.	Agency	Average Farm Size (Hect.)	Range (Hect.)
1.	Bajaur	3.5	0.2 - 92.0
2.	Khyber	1.3	0.2 - 20.4
3.	Mohamand	2.6	0.2 - 20.4
4.	Kurram	1.3	0.2 - 29.5
5.	North Waziristan	1.3	0.2 - 107.3
6.	South Waziristan	2.7	0.2 - 332.9

Farm size statistics need be used with caution for drawing inferences about land ownership patterns. It would be wise not to draw any inferences especially in tribal territories where large tracts are owned by a solitary Khan or Malik, rented out, or given away free of rent to tenants/members of the tribe. Cases of this kind are quite prominent in Bajaur.

2. Tenure Classification

In 1980 as many as 64% of the farms were owner operated, followed by tenant and owner-cum-tenants with 23% and 13% respectively. Corresponding figures by farm size are given below:

Farm Size (Hect.)	Percentage of farms operated by		
	Owners	Tenants	Owner-cum-tenants
. under 2.0	76.00	22.06	1.94
. 2.0 - 10.0	63.36	23.68	12.69
. 10.0 - 20.0	69.86	22.57	7.57
. 20.0 & above	94.70	5.30	-

As gathered from the interviews in the field in connection with this study, although a farm may be reported as owner operated, in actuality, it could be tenant operated. Large landowners seldom operate or even actively supervise their lands.

3. Tenancy Systems

The following tenancy systems are in vogue in Bajaur Agency:

i- Batai (share produce/system)
ii- Cash rent.
iii- Rent free lease in exchange/in lieu of free labour.

a) Batai System

This is the most dominant practice. The landlords and tenants share produce and costs in pre-agreed proportions. The systems in vogue are:

Tenant's Share	Tenant's obligations
. 50 % produce	. Provides manual labour. . Pays 50% cost of purchased inputs.
. 1/3rd produce	. Provides manual labour only
. 2/3rd produce	. Bears all expenses

The 50:50 produce sharing system is the most widely practiced one. According to the 1980 Census of Agriculture, the share-cropped area accounted for 83.5 percent of the tenanted area in Bajaur. For FATA, as a whole, the corresponding figure is 76.2 percent.

b) Cash Rent

In Barani areas the annual cash rent range per hectare is Rs.1500 - Rs.2500, while in the irrigated areas the average is close to Rs.5,000. The leasing out of land (on a cash rent basis), is not very common in the Agency. In the 1980 Census of Agriculture, only 16 percent of the tenanted area was recorded as having been rented out on cash rent basis. The corresponding figure for FATA is 23 percent.

c) Rent Free Land

Under this system no rent is charged or alternatively, a share in produce is taken from the land grantee. The land grantee, however, attends to the Khan who gives the land, and is not paid any obligatory salary. Only the large landholders practice this.

4. Fragmentation

The 1980 Census of Agriculture found that only 3289 farms (13%) out of the total of 25,038 were not fragmented in this Agency. The extent of fragmentation was as given below:

Fragments (No.)	Farms (%)
None	13.13
2 - 3	46.79
4 - 5	18.24
6 - 9	13.42
10 or more	8.42

There were 4.8 fragments per farm on the average in 1980. This situation is attributable largely to the law of inheritance. The existing i.e., 1992 situation with regard to land fragmentation would be much worse. That it is so, was clearly gathered from formal and informal interviews with farmers and field officers.

B. Crops

Important crops of the Agency are wheat, barley, maize, rice, rape and mustard, and masoor (lentils). Also grown are most of the common vegetables, fruit, and some pulses. Wheat and barley were the top two crops during 1975-80. They retained this position during 1980-85, but occupied a smaller proportion of total area under major crops as compared with 1975-80. Maize, rice, rape and mustard, and masoor occupied a far larger area in absolute as well as percentage terms during 1985-90 than during 1975-80.

Table VI.1

AREA UNDER MAJOR CROPS IN
BAJAUR AGENCY, 1975-80 THROUGH 1985-90

Major Crops	Average annual area					
	1975-80		1980-85		1985-90	
	Hectares	%	Hectares	%	Hectares	%
1. Wheat	25,943	56.67	25,668	42.65	34,364	43.43
2. Barley	18,216	39.99	26,624	44.24	27,400	34.68
3. Maize	920	2.01	2,204	3.66	4,520	5.71
4. Rice	317	.70	1,450	2.41	3,272	4.13
5. Rape & Mustard	377	.82	3,918	6.51	6,886	8.70
6. Masoor (lentils)	6	.01	322	.53	2,678	3.40
7. Total	45,779	100.00	60,186	100.00	79,120	100.00

Source: Based on Agricultural Statistics of NWFP, Department of Agriculture.

The cropping pattern is gradually experiencing diversification. High value crops claim more of the land now than before. This is one of the manifestations of the modernization of the agricultural sector, but the level of modernization is still very low. The diversification in the cropping pattern is attributable also to the extension in irrigation facilities; the latter came into prominence after the early eighties when many tubewells were sunk in the area.

The vegetable cultivation area has increased substantially, but it is still a minor proportion of the cropped area, and will most likely stay so in the foreseeable future. But the trend itself is important and significant in that it points to the responsiveness of the farmer to economic incentives. No great expectations should be pinned on fruit and vegetable farming as a catalyst for agricultural transformation in the near future, but it does offer a promise as a potent factor.

The most common crop rotations are:

Wheat - Maize - Wheat
Wheat - Fallow - Wheat

The main crop seasons are Rabi (October/November - April/May) and Kharif (May/June - November). In Table VI.2, information is given about the timing of various agricultural operations for some of the crops.

Table-VI.2

CROP CALENDAR FOR BAJAUR AGENCY

Month	CROPS										
	Wheat	Maize	Turnips	Radishes	Tomatoes	Okra	Barley	Poppy	Rice	Sarsoon	Masoor
January a)	9 9		10,12	10,12	2	1,2	9	6,9 9		9	9
b)											
February a)	9 9				1,3, 4 5,9	4 3,5, 9	9	6,9 9		9	9
b)											
March a)	9 9				9 9	9 3,6, 9	10 11, 12	9,10 10, 12		10 11,12	10 11,12
b)											
April a)	10 11, 12				6,9 9	9,6 9,10 ,12					
b)											
May a)					9,10 ,12 10,12	9,10 ,12 9,10 ,12			1,2		
b)											
June a)		1,2 3,4, 5			10,12				3,4, 5,9 9		
b)											
July a)		9 9							9 9		
b)											
August a)		6,9 9							3,9 9		
b)											

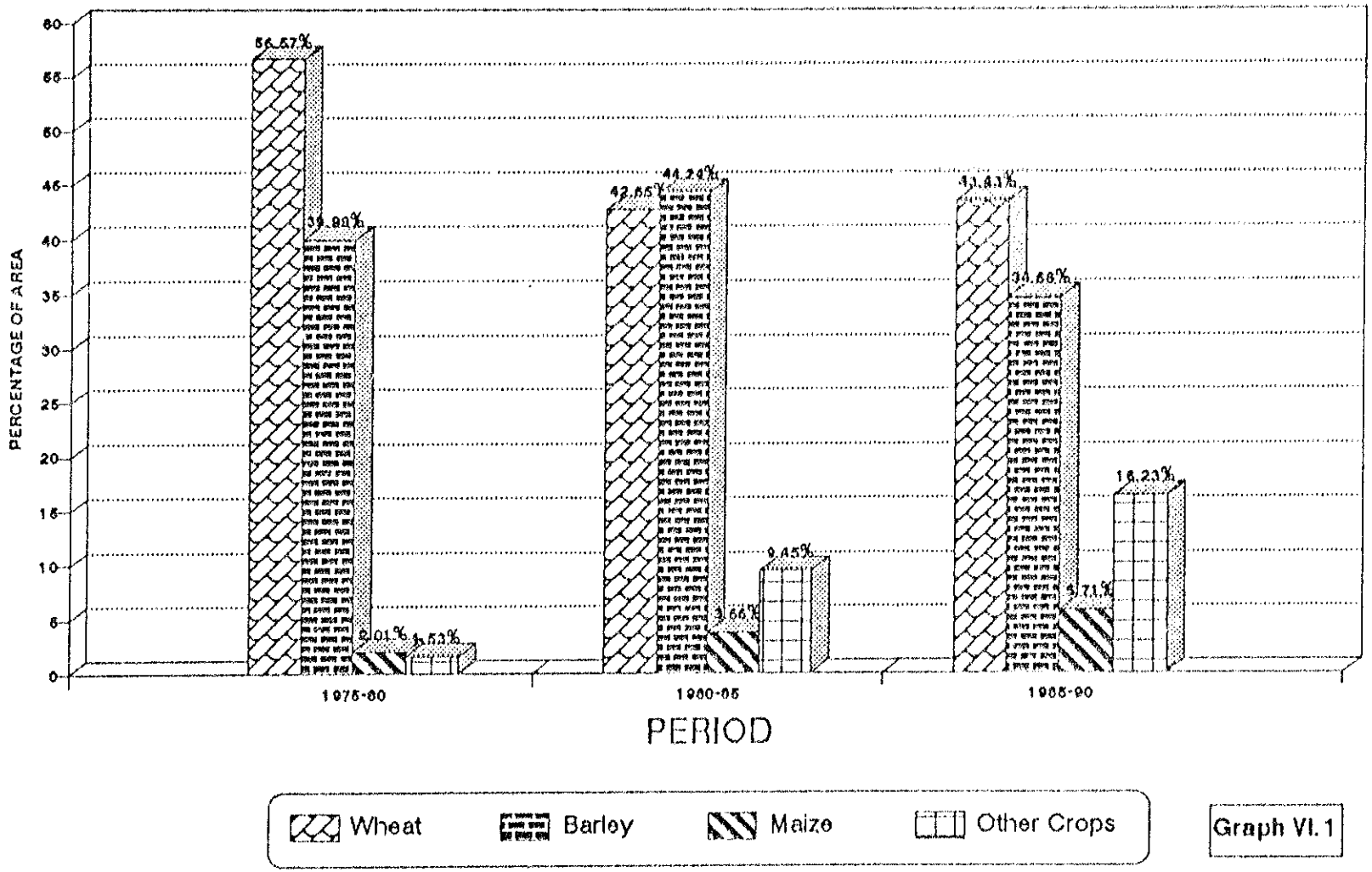
Septembe r a) b)		9 9					1,2		9 9	1,2	
October a) b)	1	9,10 11,1 2	1,3, 4 5,9	1,3, 4 5,9			3,4 5	1,2 3,4 ,5	10 11,1 2	3,4 5	1,2 3,4,5
Novembe r a) b)	1,2 3,4, 5		9 3,6, 9	9 3,6, 9			9	9 9		9	9
Decembe r a) b)	9		9 10,1 2	9 10,1 2			9	9 9			

Operation:

1. Land Preparation
2. F.Y.M. Application
3. Fertilizer Application
4. Seed Tramsportation
5. Sowing
6. Hoeing/Weeding
7. Pesticide Application
8. Herbicide Application
9. Irrigation
10. Harvesting
11. Threshing/Shelling
12. Transportation to Home/Market

a) = 1-15 of the month
b) = 15-31 of the month

AREA UNDER MAJOR CROPS
IN BAJAUR AGENCY



Graph VI.1

1. WHEAT

Wheat is widely grown all over Bajaur Agency. It occupies more area than any other crop, whether in the Rabi or Kharif season. Although the wheat area and yield per hectare, have both increased over time, the Agency has to augment its wheat supply by purchases from the settled districts. The bulk of the crop is grown on unirrigated land, however, the proportion of irrigated area has increased substantially. The varieties are mostly those introduced in the sixties, but the awareness and incidence of use of improved inputs appear to be increasing steadily. Concerted extension work can quickly and visibly improve the wheat farming enterprise in this Agency. Further relevant aspects of area, production, input use, etc. of this crop are described as follows:

a) Area

Wheat claimed 25,943 hectares annually during the quinquennium 1975-80. The corresponding figure for the 1985-90 quinquennium is 34,364 hectares indicating an increase of 32% in area over 1975-80; see Table-VI.I. This is a fairly large increase in absolute as well as percentage terms. However, the most noteworthy and important development of the period (1975-90), is that of an increase in the irrigated area with quite a visible impact on the total and per hectare production. As will be seen in Table-VI.3 summarized below, during 1975-80 wheat was grown on 780 hectares of irrigated land annually on the average, accounting for three percent of the total wheat area. The corresponding figures for 1985-90 are 6172 hectares and 22 percent respectively. The irrigated area's expansion is brought in sharper focus by a comparison of the situation in 1975-76 and 1989-90, during which period it increased from 777 hectares to 9560 hectares with an increase in total wheat area from 2.94% to 31.41% respectively.

It is necessary to point out a few observations about hectare statistics before continuing with an analysis of production and yield trends. Although solid and objective evidence is not available on the reliability of wheat area statistics, the pattern of statistics given in Table-VI.I does give rise to doubt the accuracy of these statistics and whether they are based on surveys or arbitrary estimates. For example, the figure of 27,202 hectares is repeated twice (1974-75 and 1975-76); that of 25,050 hectares the same number of times; that of 25,910 hectares for five years; and 40,000 hectares for three years. How can the cultivated area stay the same for so many years in a row? The reliability factor of the statistics deserves be seriously considered for future profiles.

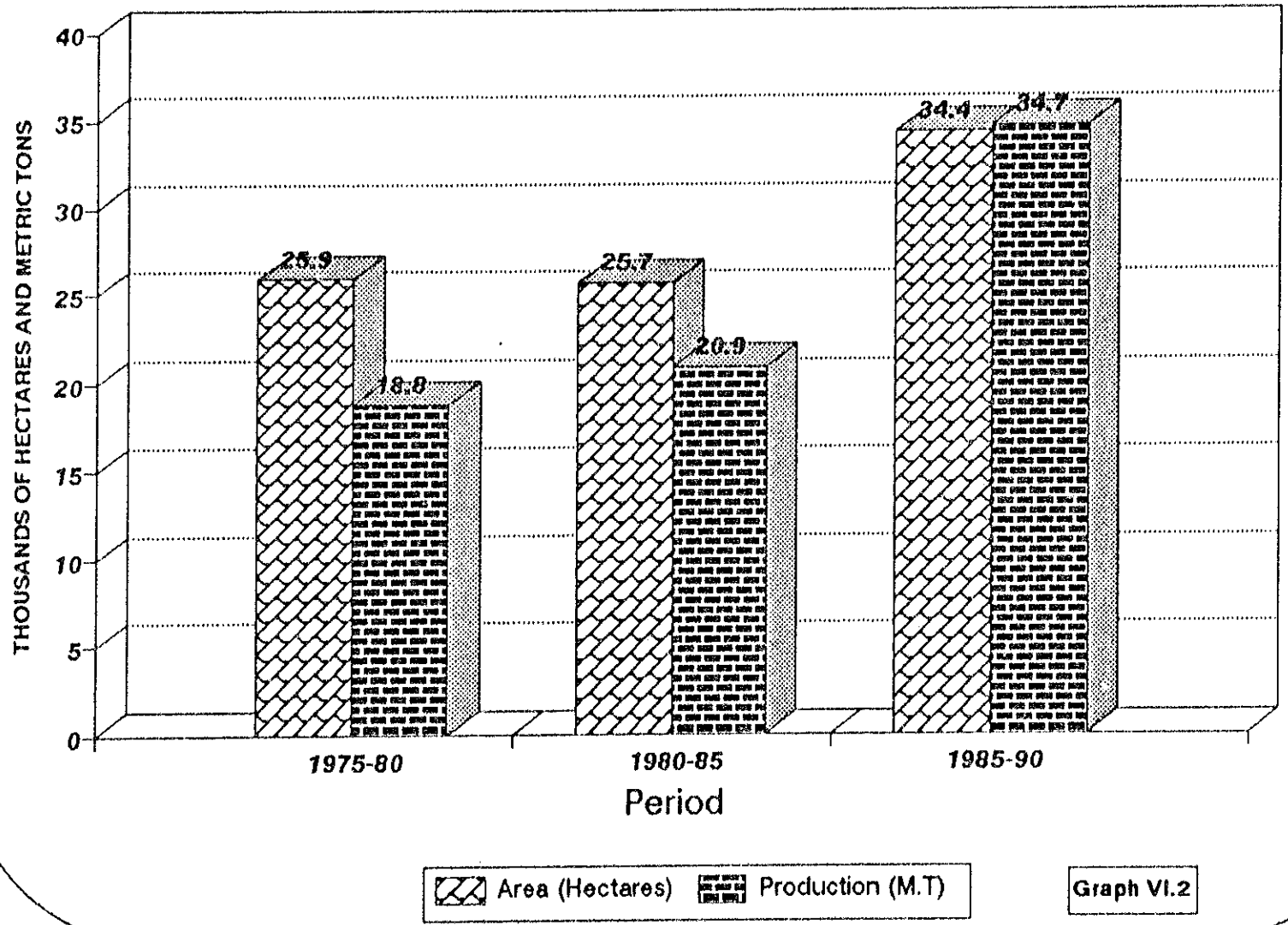
Table-VI.3

AREA, TOTAL PRODUCTION AND YIELD OF WHEAT IN BAJAUR AGENCY

Year		Area (hectares)			Production (Metric Tons)			Yield/Hectares (Metric Tons)		
		Irri.	Unirri.	Total	Irri.	Unirri.	Total	Irri.	Unirri.	Total
	1975-76	777	26425	27202	965	14834	15799	1.24	0.56	0.58
	1975-77	777	26425	27202	965	14834	15799	1.24	0.56	0.58
	1977-78	769	24281	25050	1062	19449	20511	1.38	0.80	0.82
	1978-79	769	24282	25051	1060	19520	20580	1.38	0.80	0.82
	1979-80	810	24400	25210	1113	20006	21119	1.37	0.82	0.84
Av.	1975-80	780	25163	25943	1033	17729	18762	1.32	0.70	0.72
	1980-81	900	24400	25300	1236	20006	21242	1.37	0.82	0.84
	1981-82	910	24400	25310	1250	20006	21256	1.37	0.82	0.84
	1982-83	910	25000	25910	1250	20498	21748	1.37	0.82	0.84
	1983-84	1092	24818	25910	1712	18311	20023	1.57	0.74	0.77
	1984-85	1090	24820	25910	1712	18318	20030	1.57	0.74	0.77
Av.	1980-85	980	24688	25668	1432	19428	20860	1.46	0.79	0.81
	1985-86	1090	24820	25910	1725	18591	20316	1.58	0.75	0.78
	1986-87	1090	24820	25910	1725	22875	24600	1.58	0.92	0.95
	1987-88	9560	30440	40000	17000	20950	37950	1.78	0.69	0.95
	1988-89	9560	30440	40000	18182	22039	40221	1.90	0.72	1.01
	1989-90	9560	30440	40000	18182	32218	50400	1.90	1.06	1.26
Av.	1985-90	6172	28192	34364	11363	23335	34697	1.84	0.83	1.01

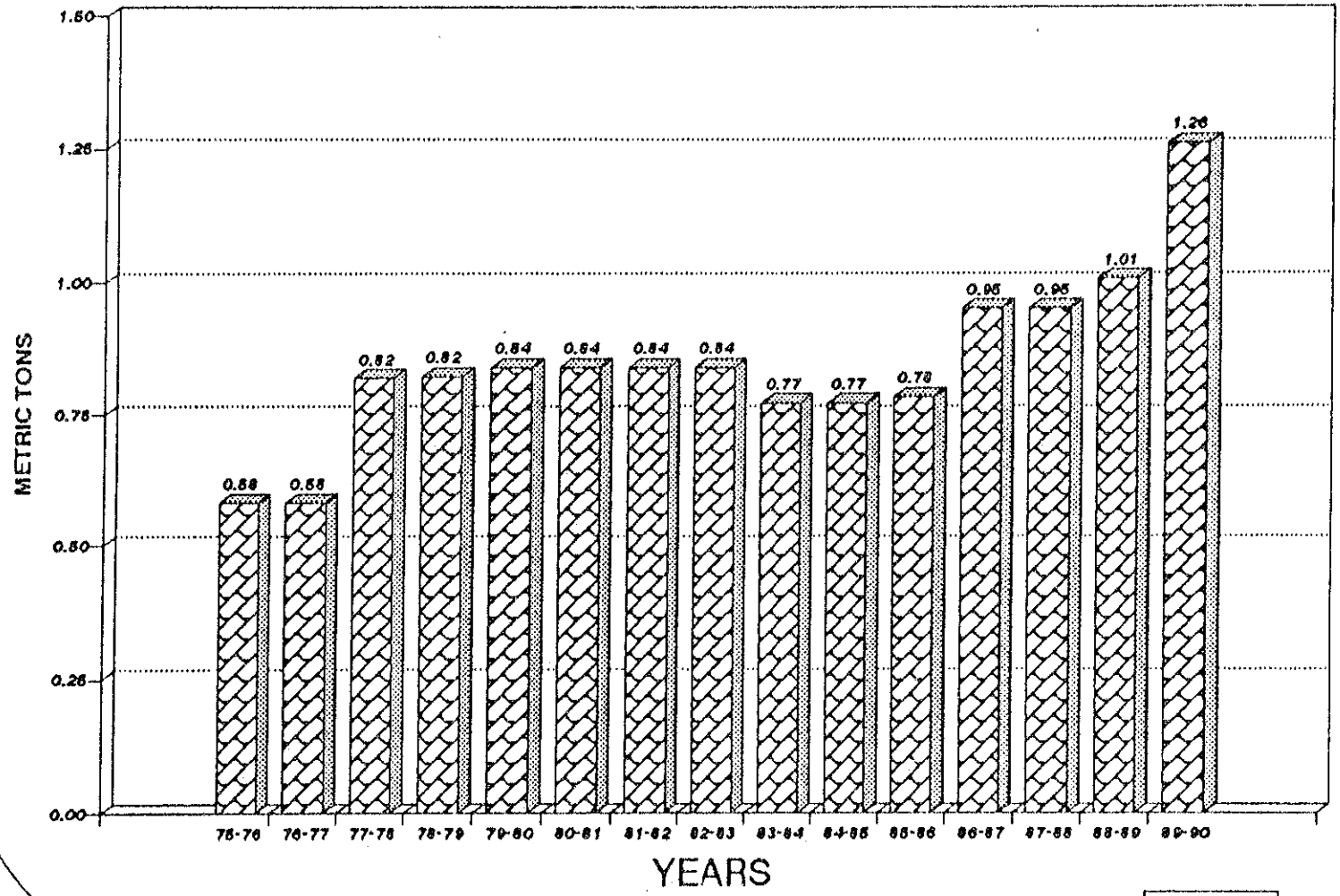
Source: Agricultural Statistics of NWFP Department of Agriculture

WHEAT AREA AND PRODUCTION



Graph VI.2

YIELD/HECTARE (METRIC TONS) OF WHEAT IN BAJAUR AGENCY



Graph VI.3

b) Total Production and Yield

The average annual wheat production during 1975-80 was 18,762 metric tons with a yield of 720 kg. per hectare. The corresponding figures for the period from 1985-90 are 34,697 metric tons and 1010 kg. Thus, the average annual production during 1985-90 was 85 percent more than that of 1975-80. During this period, the total wheat area, as noted above, increased by 32 percent which signifies that the total production increased more due to the increase in yield per hectare than the increase in area. This increase is gratifying.

The repetiousness of identical or near identical yield figures for several years in a row arouses doubts as to their accuracy similar to those expressed earlier in the case of area. As will be seen in Table-VI.I, the wheat yield/hectare stayed at or near the figure of 1.37/1.38 MT for six years in a row, at 1.57/1.58 MT for five years, and at 1.90 MT for two years on irrigated lands. The trend is more or less the same in the case of un-irrigated lands.

2. BARLEY

Barley is one of the most important crops after wheat in terms of area cultivated. The entire crop is locally consumed and is raised almost entirely on unirrigated land. Its area has been subject to erratic trends during the past fifteen years. The yield has remained mostly stagnant, but has been showing improvement for the last three years. There are indications that wheat is successfully competing with this crop for land.

a) Area

Barley was cultivated over an area of 18216 hectares annually during 1975-80 which was 30% less than that of wheat. The figure rose to 26,624 hectares during the quinquennium ending 1984-85 and to 27,400 hectares in that ending in 1989-90. The area in hectares in 1989-90 is 50% more than that of 1979-80, but it is important to state that after reaching the peak of 38,500 hectares in 1983-84, and staying there till 1986-87, it declined to 20,000 hectares in 1987-88 and has remained at that level ever since (Table-VI.4).

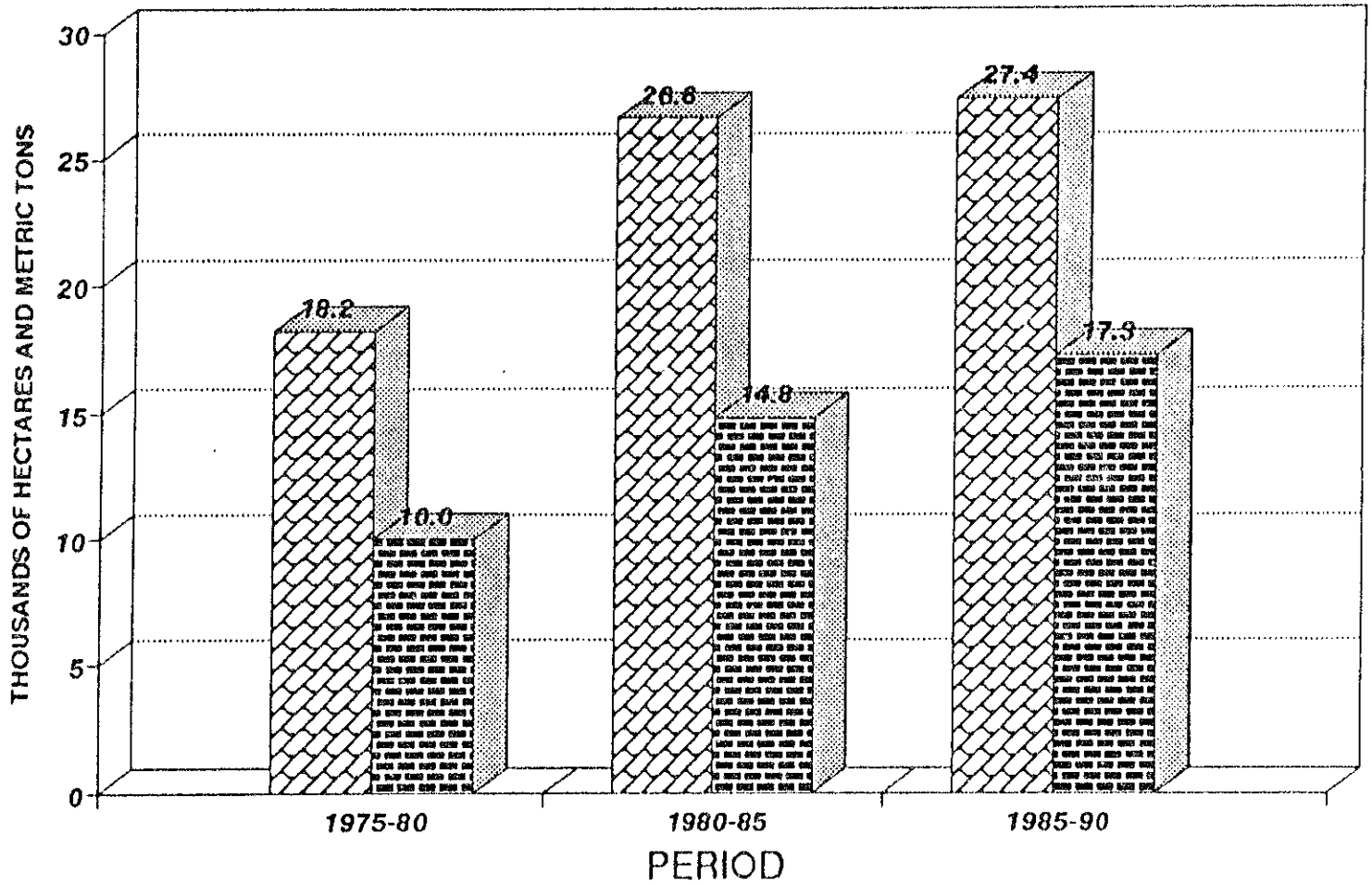
Table-VI.4

AREA, TOTAL PRODUCTION AND YIELD OF BARLEY IN BAJAUR AGENCY

	Year	Area (hectares)			Production (Metric Tons)			Yield/Hectares (Metric Tons)		
		Irri.	Unirri.	Total	Irri.	Unirri.	Total	Irri.	Unirri.	Total
	1	2	3	4	5	6	7	8	9	10
	1975-76	142	18008	18150	114	9775	9889	0.80	0.54	0.55
	1976-77	142	18049	18191	114	9779	9893	0.80	0.54	0.54
	1977-78	142	18049	18191	114	9779	9893	0.80	0.54	0.54
	1978-79	-	18272	18272	-	10234	10234	-	0.56	0.56
	1979-80	-	18275	18275	-	10235	10235	-	0.56	0.56
Av.	1975-80	142	18131	18216	114	996	10029	0.80	0.55	0.55
	1980-81	20	18280	18300	22	10238	10260	1.10	0.56	0.56
	1981-82	20	18300	18320	22	10249	10271	1.10	0.56	0.56
	1982-83	20	19480	19500	22	10910	10932	1.10	0.56	0.56
	1983-84	40	38460	38500	44	21282	21326	1.10	0.55	0.55
	1984-85	40	38460	38500	44	21280	21324	1.10	0.55	0.55
Av.	1980-85	28	26596	26624	31	14792	14823	1.10	0.56	0.56
	1985-86	40	38460	38500	45	21305	21350	1.13	0.55	0.55
	1986-87	97	38403	38500	85	21315	21400	0.88	0.56	0.56
	1987-88	100	19900	20000	95	12820	12915	0.95	0.64	0.64
	1988-89	100	19900	20000	120	12830	12950	1.20	0.65	0.64
	1989-90	100	19900	20000	106	17927	18033	1.06	0.90	0.65
Av.	1985-90	87	27313	27400	90	17239	17330	1.03	0.63	0.63

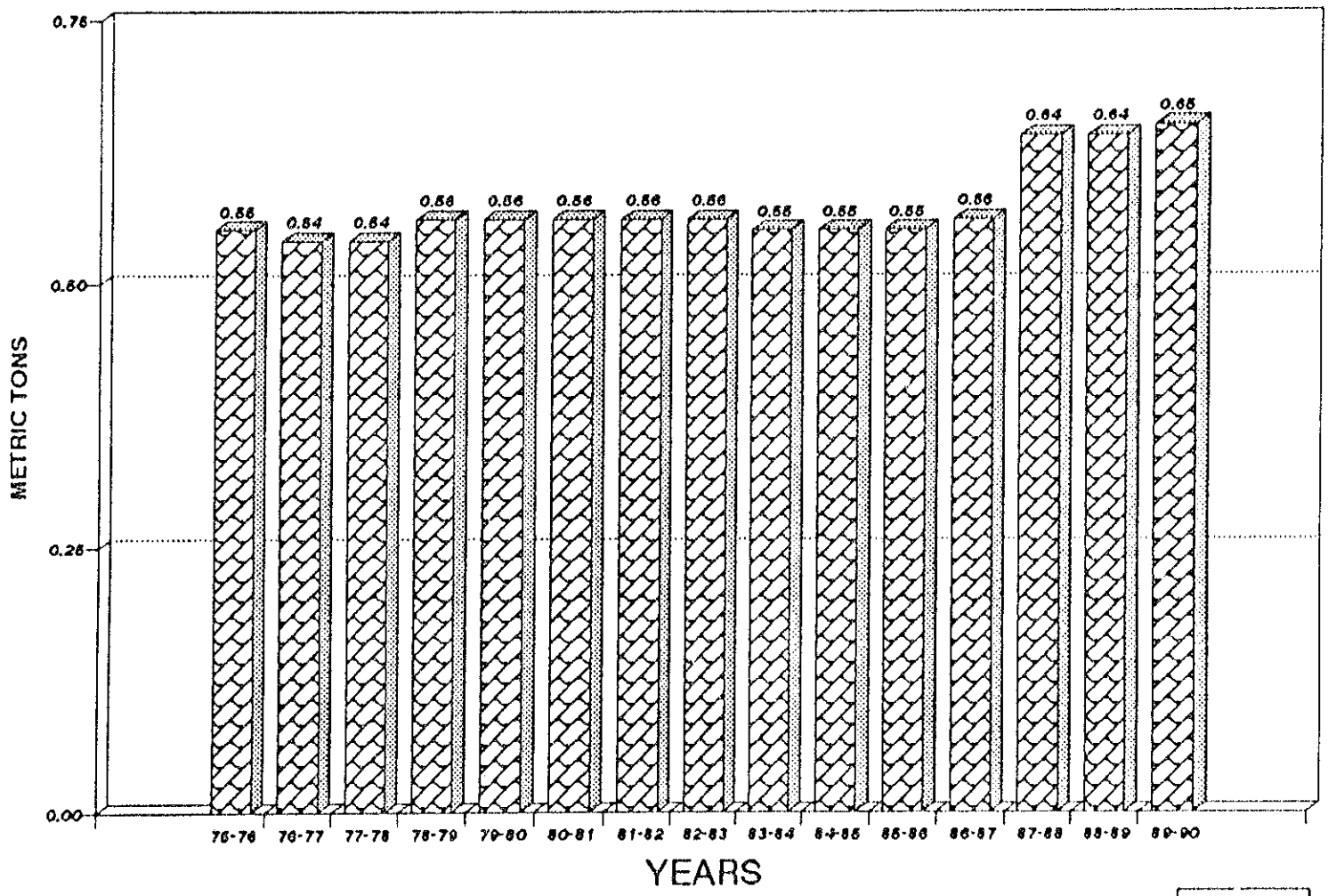
Source: Agricultural Statistics of NWFP: Department of Agriculture.

BARLEY AREA AND PRODUCTION



Graph VI.4

YIELD/HECTARE (METRIC TONS) OF BARLEY IN BAJAUR AGENCY



Graph VI.5

Barley is apparently losing area to wheat. The latter registered a substantial increase in area, 14,090 hectares in 1987-88, the year when barley's area declined steeply by 18500 hectares.

In 1989-90, this crop was grown over 20,000 hectares out of which only 100 hectares were irrigated. It is interesting to note that in 1975-76 this crop's irrigated area was 142 hectares.

Tehsil Mamund accounts for 26.19 percent of the barley area followed by Khar tehsil with a corresponding figure of 23.81 percent. These figures are for the 1991-92 Rabi, but portray the general situation.

Table VI.4.1

AREA BY TEHSIL UNDER BARLEY IN BAJAUR AGENCY: 1991-92

Tehsil	Area under Barley Crops	
	Hectares	%
1. Khar	5,000	23.81
2. Nawagai	2,000	9.52
3. Mamund	5,500	26.19
4. Salarzai	3,000	14.29
5. Utmankhel	2,000	9.52
6. Barang	3,500	16.67

b) Production and Yield

Barley production increased by 73 percent as compared to a 50 percent increase in its area during 1975-90. The yield improvements are indicated by these figures. Yields remained almost stagnant throughout the period 1975-87, at 0.56 MT/hectares. In 1987-88, yields improved to 0.64 MT/hectare and rose to the all-time peak of 0.90 MT/hectare in 1989-90 (Table-VI.4).

3. MAIZE

Maize is emerging as an important crop. It is grown for grain and also for fodder. In both cases it is used mainly by the growers themselves. None of the farmers interviewed for this study reported sales of maize fodder or grain. This can be generalized for most farmers, however, small quantities of maize are sold outside the Agency by farmers in Khar Tehsil and Salarzai Tehsil.

a) Area

Maize area averaged 920 hectares annually during 1975-80. The corresponding figure is 4520 hectares for 1985-90 (Table VI.5). The entire maize area is irrigated.

b) Production

The average annual production of maize was estimated at 1286 MT during 1975-80. The yield per hectare was 1.64 MT. For the quinquennium ending in 1989-90, the corresponding figures are 7813 MT and 1.73 MT respectively (Table VI.5).

The total production figures given in Table VI.5 seem doubtful. These figures seem to be based on the assumption that maize for the entire area given in Table VI.5 reached grain stage in the given years. If this is the case, then the assumption is not a realistic one. As indicated by the sample farmer reports, the entire maize crop does not always reach the grain stage, especially when the irrigation water supply is erratic, short in supply, or is not available at the required time. Frequent and prolonged load shedding of electricity has been playing havoc with maize farmers, and because of that, the tubewell water supply is very erratic which harms maize growth. Use of the crop as fodder is, therefore, the major use. It would be interesting to study empirically how much of the crop reaches grain stage, and then revise the maize grain production estimates accordingly.

The maize yield/hectare statistics are more or less stable at 1.74 to 1.75 metric tons/hectare. In the quinquennium ending in 1979-80, maize yield averaged at 1.64 MT/hectare. In the next two corresponding periods it was 1.74 MT/hectare and 1.73 MT/hectare respectively.

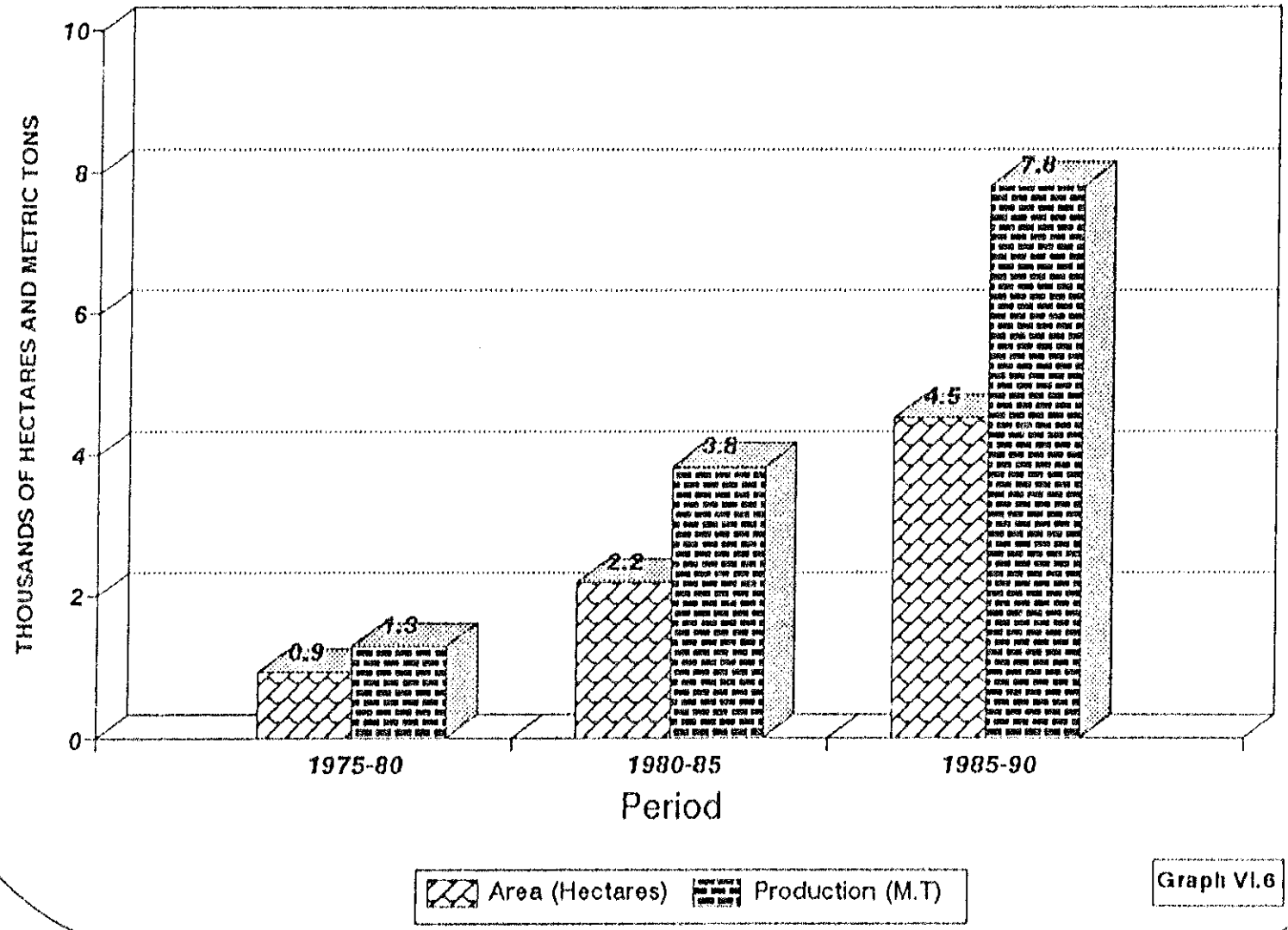
Table-VI.5

AREA, TOTAL PRODUCTION AND YIELD OF MAIZE IN BAJAUR AGENCY

	Year	Area (hectares)			Production (Metric Ton)			Yield/Hectares (Metric Tons)		
		Irri.	Unirri.	Total	Irri.	Unirri.	Total	Irri.	Unirri.	Total
	1	2	3	4	5	6	7	8	9	10
	1975-76	2266	26	2792	2794	467	3261	1.23	0.89	1.17
	1975-77	405	-	405	711		711	1.76	-	1.76
	1977-78	425	-	425	747		747	1.76	-	1.76
	1978-79	486	-	486	853		853	1.76	-	1.76
	1979-80	490	-	490	857		857	1.75	-	1.75
Av.	1975-80	814	526	920	1192	467	1286	1.46	0.89	1.64
	1980-81	500	-	500	870	-	870	1.74	-	1.74
	1981-82	520	-	520	905	-	905	1.74	-	1.74
	1982-83	3000	-	3000	5221	-	5221	1.74	-	1.74
	1983-84	3500	-	3500	6100	-	6100	1.74	-	1.74
	1984-85	3500	-	3500	6120	-	6120	1.75	-	1.75
Av.	1980-85	2204		2204	3843		3843	1.74	-	1.74
	1985-86	3500	-	3500	6120	-	6120	1.75	-	1.75
	1986-87	3500	-	3500	6120	-	6120	1.75	-	1.75
	1987-88	5600	-	5600	9790	-	9790	1.75	-	1.75
	1988-89	5000	-	5000	8500	-	8500	1.70	-	1.70
	1989-90	5000	-	5000	8533	-	8533	1.71	-	1.71
Av.	1985-90	4520		4520	7812.6		7813	1.73	-	1.73

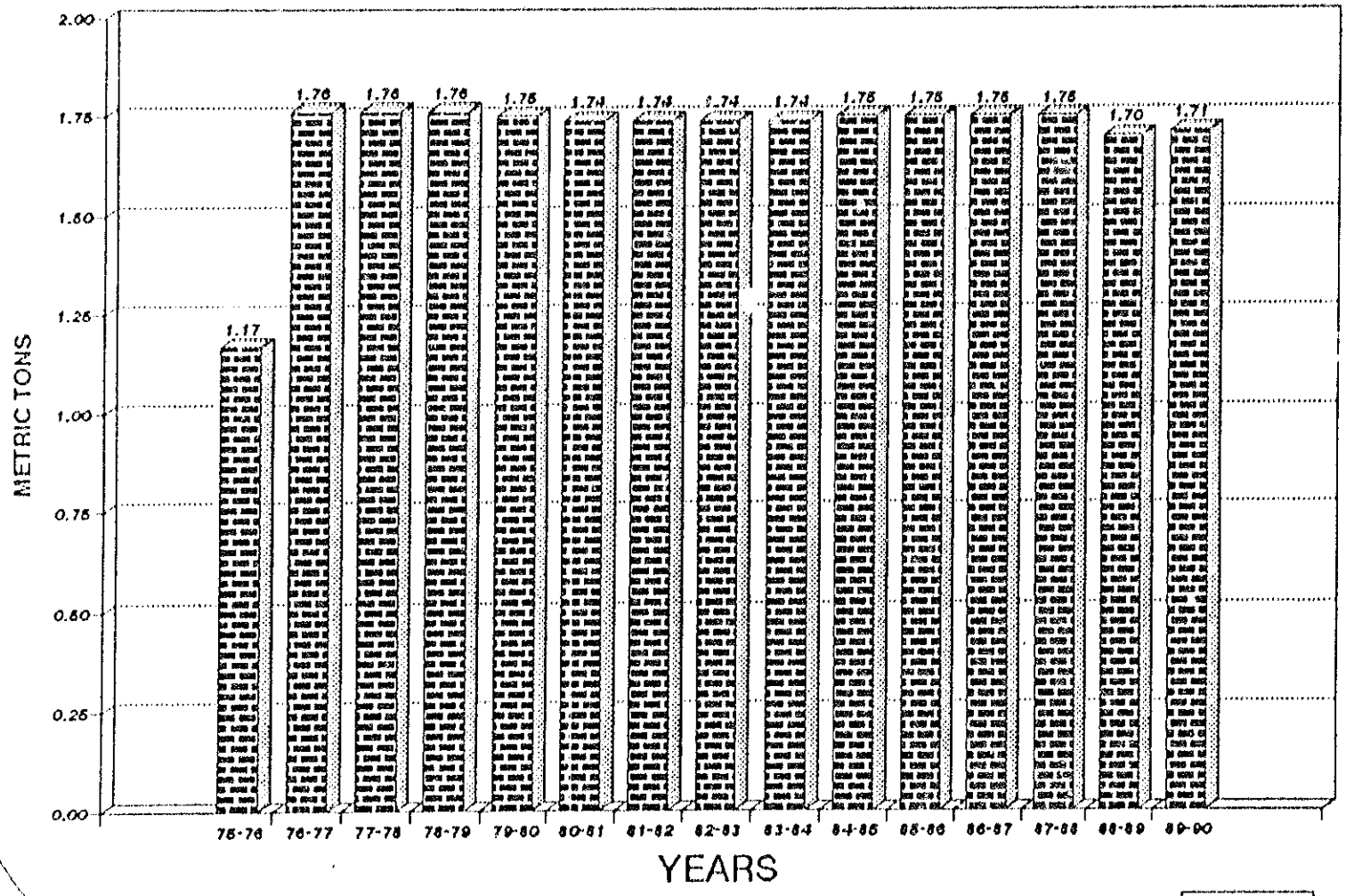
Source: Agricultural Statistics of NWFP: Department of Agriculture.

MAIZE AREA AND PRODUCTION



Graph VI.6

YIELD/HECTARE (METRIC TONS) OF MAIZE IN BAJAUR AGENCY



Graph VI.7

4. RICE

Rice has been claiming more and more of the land since the early eighties. It is one of the important agricultural exports of the Agency.

a) Area

Rice was grown over 316 hectares of land annually during 1975-80 in the Agency. The figure rose to 3272 hectares during 1985-90. In 1987-89 it reached the peak of 4120 hectares and remained at that level (Table VI.6).

The rice area started increasing rapidly in the early eighties and especially after 1986-87. In 1980-81, the area rose to 1000 hectares, rising further to 2000 hectares in 1983-84 and to 4120 hectares in 1987-88. It is, understandably all irrigated, and is co-related with the expansion of tubewell irrigation in the Agency. The bulk of the rice is produced in Salarzai Tehsil, which accounted for 2,000 hectares out of the total area of 4,120 hectares under rice in this Agency in 1989-90. The tehsils of Khar and Utmankel accounted for 1,000 hectares each, while Tehsil Barang had only 120 hectares under this crop in 1989-90.

b) Production

From a mere 403 MT a year during 1975-80, rice production jumped to 1772 MT a year during 1980-85. The corresponding figure for 1985-90 is 4182 MT. Thus during 1975-90, the total production of this crop increased by 136%.

The yield per hectare remained almost stagnant throughout the period under review. It was 1.27 MT/Hectare during 1975-80 and only 1.28 MT/Hectare during 1985-90 after having declined to 1.22 MT/Hectare during 1980-85. During 1986, the per hectare rice yield in Bajaur Agency was 1.2 M.T as compared with the corresponding figures of 1.3 M.T in Kurram Agency, 1.5 MT in North Waziristan, and 0.9 M.T in Orakzai.

Table VI.6

AREA, TOTAL PRODUCTION AND YIELD OF RICE IN BAJAUR AGENCY

	Year	Area (hectares)	Production (Metric Tons)	Hield/Hectare (Metric Tons)
	1975-76	342	424	1.24
	1976-77	203	305	1.50
	1977-78	344	422	1.23
	1978-79	344	436	1.27
	1979-80	350	428	1.22
Av.	1975-80	316.5	403	1.27
	1980-81	1000	1204	1.20
	1981-82	1050	1260	1.21
	1982-83	1200	1447	1.21
	1983-84	2000	2469	1.24
	1984-85	2000	2472	1.24
Av.	1980-85	1450	1771.6	1.22
	1985-86	2000	2472	1.24
	1986-87	2000	2478	1.24
	1987-88	4120	5200	1.26
	1988-89	4120	5250	1.27
	1989-90	4120	5510	1.34
	Av1985-90	3272	4182	1.28

Source: Agricultural Statistics of NWFP: Department of Agriculture.

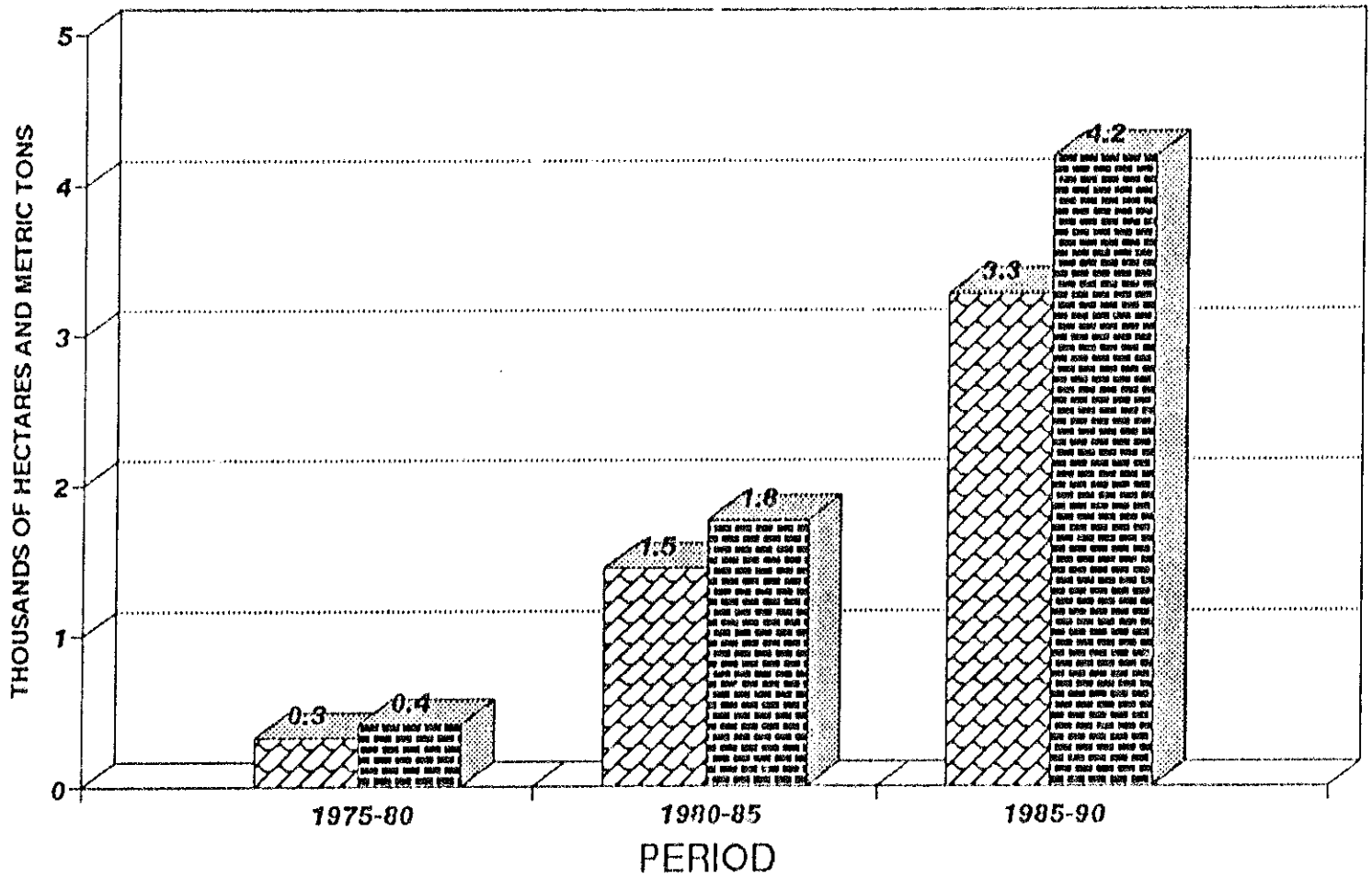
Table VI.6.1

TEHSIL-WISE AREA UNDER RICE IN BAJAUR AGENCY IN 1989-90

	Tehsil	Area (Hectares)
1.	Salarzai	2,000
2.	Khar	1,000
3.	Utmankhel	1,000
4.	Barang	120
	Total:	4,120

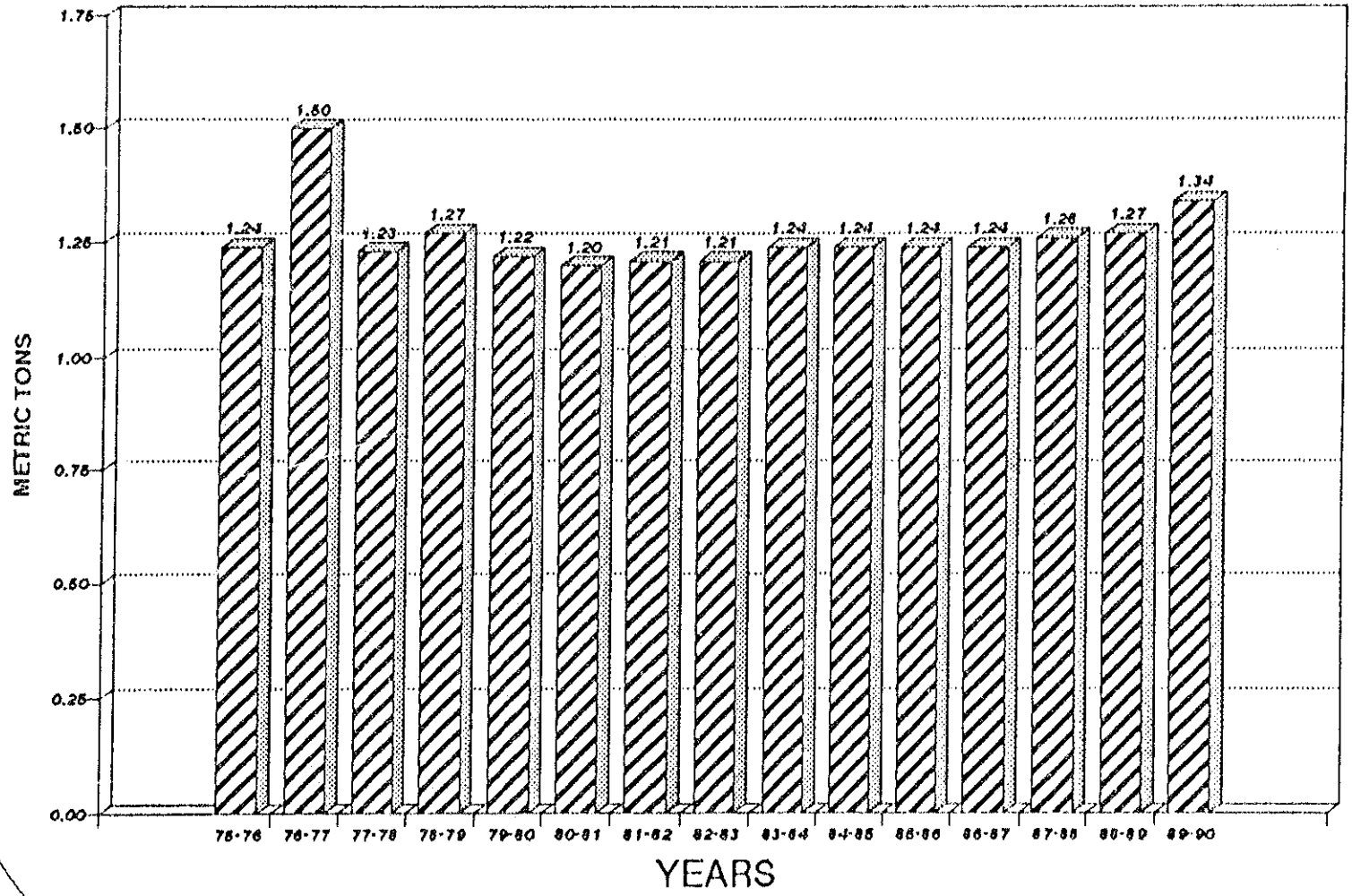
Source: Office of Extra Assistant Director of Agriculture, Khar, Bajaur Agency.

RICE AREA AND PRODUCTION



Graph VI.8

YIELD/HECTARE (METRIC TONS) OF RICE IN BAJAUR AGENCY



Graph VI.9

5. RAPE AND MUSTARD

Both the area and yield of the rape and mustard crop have registered substantial increases since the early eighties. It is an important export of the Agency, and indications are that its area growth trend which is presently stable at the 1987-88 level will again increase.

a) Area

Until 1980-81, the area for rape and mustard never exceeded 420 hectares. The average for the period 1975-80 was 377 hectares. The greatest increase came in 1982-83 when the area rose to 5,000 hectares, rising further to 5,125 hectares in 1983-84 and staying at that level until 1986-87. Then in 1987-88, it registered and increase to 8060 hectares and remained there until 1989-90. Thus, all told, during 1975-80 through 1985-90, the rape and mustered area increased 18 fold. The crop is grown mainly on unirrigated land which accounts for 97 percent of its area (Table VI.7).

Bajaur accounted for as much as 98.84% of rape and mustard area of F.A.T.A in 1986-87. For production, the corresponding figure is 97.10%

b) Production

The total production of rape and mustard in Bajaur was a mere 42 MT/year during 1975-80. The average rose to 1317 MT during 1985-90 due to steep increase in area under the crop combined with a steady increase in per hectare yield.

Yields are substantially higher on irrigated land compared to unirrigated land. The five yearly averages for 1985-90 are 0.41/Hectare and 0.18 MT/Hectare.

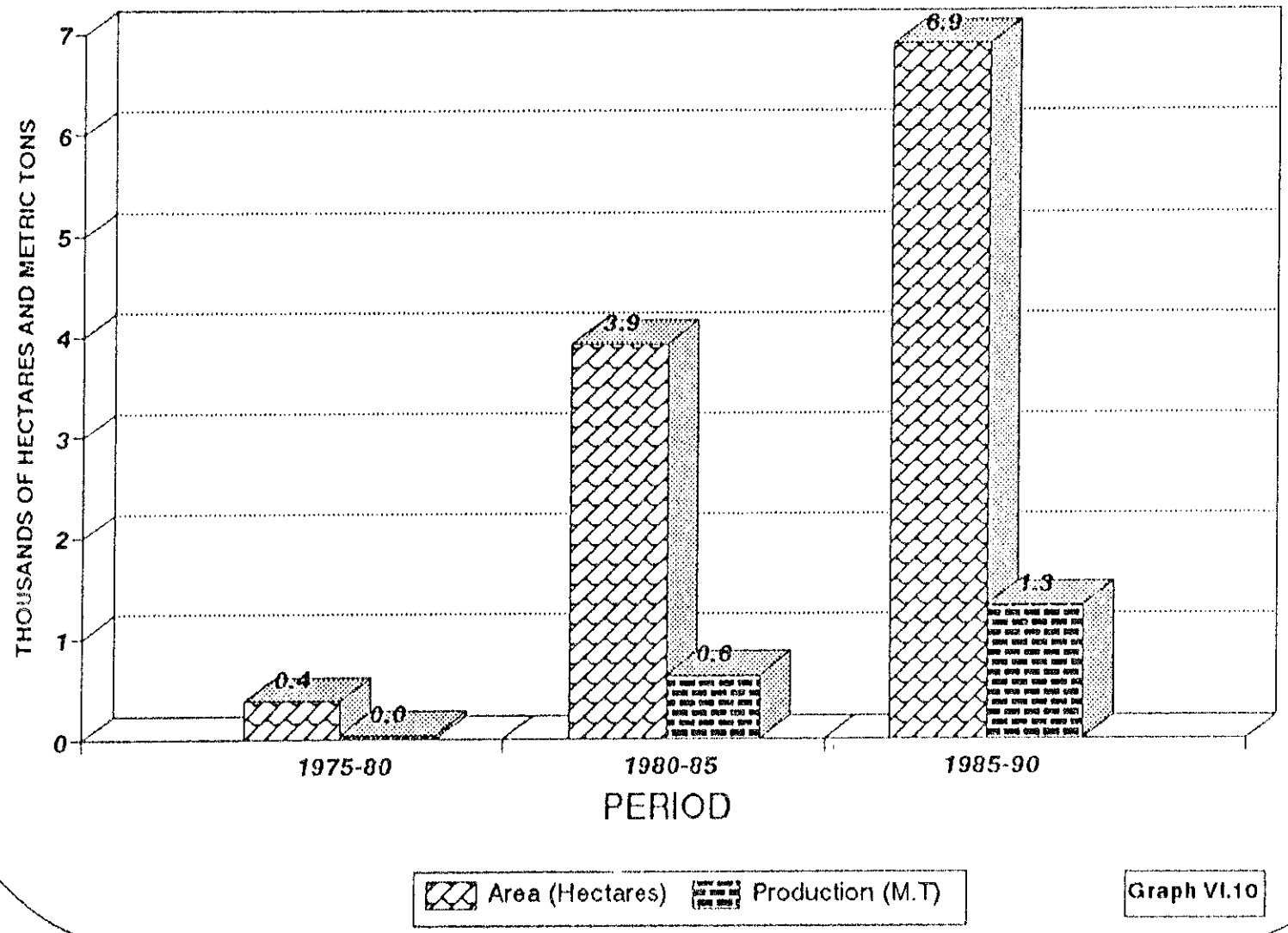
Table VI.7

AREA, TOTAL PRODUCTION AND YIELD OF RAPE AND MUSTARD IN BAJAUR AGENCY

Year	Area (hectares)			Production (Metric Tons)			Yield/Hectares (Metric Tons)		
	Irri.	Unirri	Total	Irri.	Unirri	Total	Irri.	Unirri.	Total
1	2	3	4	5	6	7	8	9	10
1975-76	40	324	364	11	28	39	0.28	0.09	0.11
1976-77	40	324	364	11	28	39	0.28	0.09	0.11
1977-78	40	332	372	11	29	40	0.28	0.09	0.11
1978-79	40	336	376	11	31	42	0.28	0.09	0.11
1979-80	60	350	410	17	32	50	0.28	0.09	0.11
Av. 1975-80	44	333.2	377.2	12.1	29.6	42	0.28	0.09	0.11
1980-81	100	320	420	46	118	164	0.46	0.37	0.39
1981-82	-	-	-	-	-	-	-	-	-
1982-83	200	4800	5000	56	708	764	0.28	0.15	0.15
1983-84	205	4920	5125	57	726	783	0.28	0.15	0.15
1984-85	200	4925	5125	56	724	780	0.28	0.15	0.15
Av. 1980-85	141	3741.3	3917.5	53.8	569	622.8	0.33	0.21	0.21
1985-86	200	4905	5125	56	729	785	0.28	0.15	0.15
1986-87	205	4920	5125	60	740	800	0.29	0.15	0.16
1987-88	200	7860	8060	100	1200	1300	0.50	0.15	0.16
1988-89	235	7825	8060	100	1250	1350	0.43	0.16	0.17
1989-90	235	7825	8060	130	2220	2350	0.55	0.28	0.29
Av. 1985-90	215	6671	6886	89.2	1227.8	1317	0.41	0.18	0.19

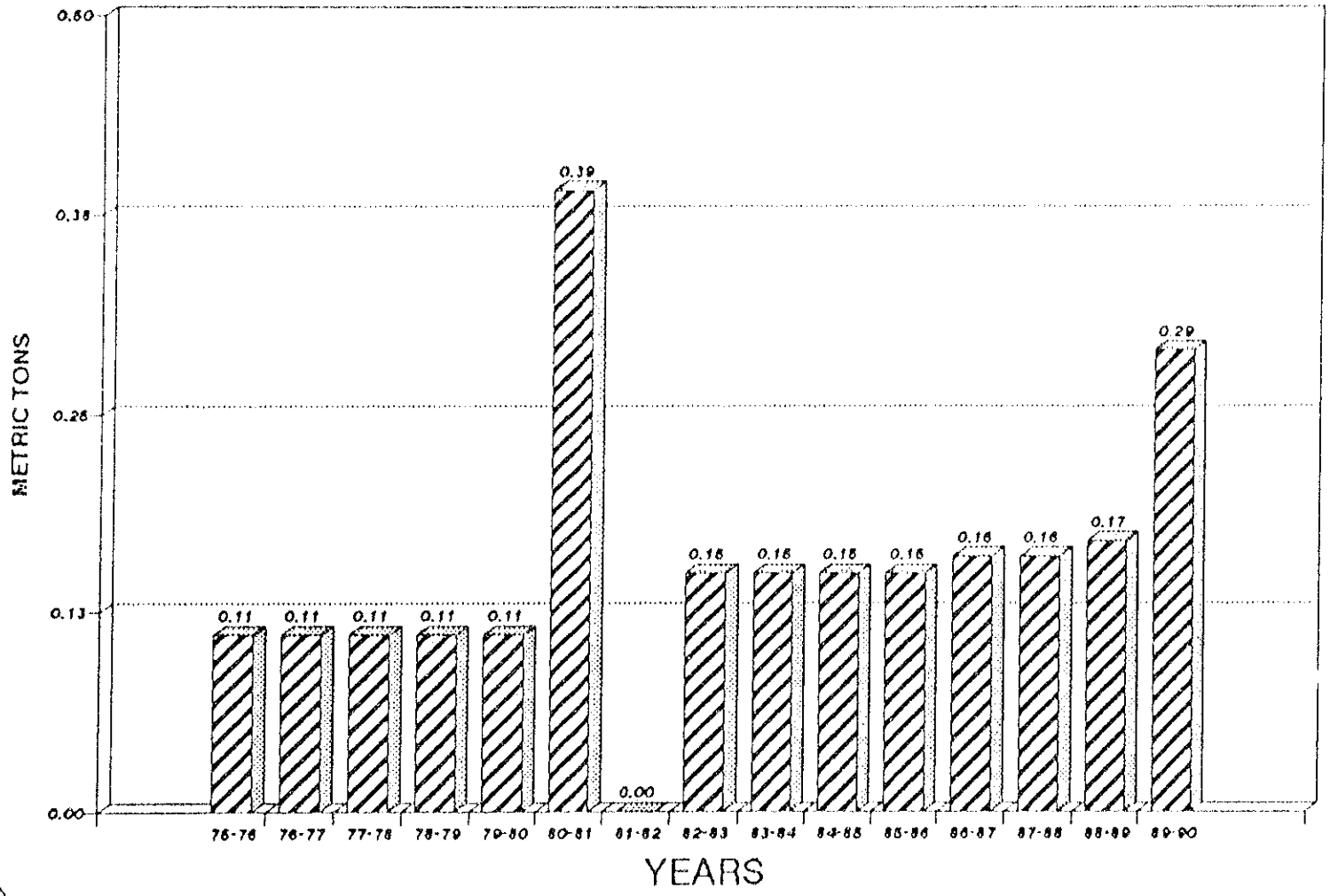
Source: Agricultural Statistics of NWFP: Department of Agriculture.

RAPE/MUSTRAD AREA AND PRODUCTION



Graph VI.10

YIELD/HECTARE (METRIC TONS) OF
RAPE AND MUSTARDIN BAJAUR AGENCY



Graph VI.11

6. SUGARCANE

Sugarcane is grown on a very limited scale. The area averaged only 33 hectares annually during 1975-80. The corresponding figures for 1980-85 and 1985-90 are 44 hectares and 58 hectares respectively (Table VI.8). Not much improvement has been registered in yield. In 1979-80, it was 24.13 MT/Hectares, in 1984-85 the figure was 24.46 MT, and in 1989-90 the all-time high of 25.08 MT was recorded. Some comparative statistics on yield are given below for the year 1986-87.

	Sugarcane Yield (MT/Hectare)
Bajaur Agency	24.42
Mohmand Agency	25.19
Khyber Agency	20.12
Kurram Agency	21.53
South Waziristan	20.40
North Waziristan	22.60

The sugarcane crop requires heavy irrigation. Bajaur Agency is presently not well placed in this respect. Unless this constraint is removed, the prospects of sugarcane area expansion would not be great. The farmers do not look upon it as an important crop, and those who grow it, grow it mainly for domestic use for making Gur. Should irrigation facilities be extended substantially, however, this crop would be a strong competitor for additional water supplies.

Table VI.8

AREA, TOTAL PRODUCTION AND YIELD OF SUGARCANE IN BAJAUR AGENCY

Year	Area# (hectares)	Production (Metric Tons)	Yield/Hectares (Metric Ton)
1975-76	25	449	17.96
1976-77	40	406	10.15
1977-78	41	610	14.88
1978-79	28	676	24.14
1979-80	30	724	24.13
Av. 1975-80	32.8	573	18.25
1980-81	35	855	24.43
1981-82	45	1100	24.45
1982-83	45	1100	24.45
1983-84	48	1173	24.44
1984-85	48	1174	24.46
Av. 1980-85	44.2	1080.4	24.44
1985-86	48	1174	24.46
1986-87	52	1270	24.42
1987-88	64	1563	24.42
1988-89	60	1500	25.00
1989-90	64	1605	25.08
Av. 1985-90	57.6	1422.4	24.69

= All irrigated

Source: Agricultural Statistics of NWFP: Department of Agriculture.

7. VEGETABLES

Vegetable farming is fast gaining ground in Bajaur Agency. Some thirteen types of vegetables are reported in the official statistics. These are turnips, spinach, radishes, onions, chillies, potatoes, ladyfingers, tinda (gourd), brinjal (eggplant), pumpkins, bittergourds, bottlegourds, and tomatoes. In area, turnips, spinach, ladyfingers, and tomatoes are the most important vegetables. Despite a rapid expansion in the overall area and production of vegetables, the Agency augments its supplies of vegetables, particularly tomatoes and potatoes, from outside.

a) Area

As stated above, a considerable increase has taken place in vegetable area in the Agency since 1975-80. In the latter period, the average annual vegetable area was only 128 hectares (Table VI.9). The corresponding figure is 1274 hectares for the period from 1986-91. The greatest increase came after 1986-87 and seem to be associated with the expansion in irrigation facilities. As gathered from interviews with farmers, vegetable farming is becoming increasingly popular. Commercial scale production is concentrated close to metalled roads, and near large population centers.

Bajaur's comparative position in respect to vegetable area in FATA during 1986-87 is shown in Table VI.10. Bajaur accounted for as much as 98 percent of the spinach area in FATA during 1986-87. The corresponding figure for turnips is 54 percent.

b) Production

In line with the area, the total production of vegetables recorded a substantial increase during 1975-80 through 1985-90. As can be seen in Table VI.9, the average annual production of vegetables was 1,245 MT during 1975-80 from which level it rose to 2,383 MT or by 91 percent during 1980-85. The 1985-90 average was seven times larger than that of 1975-80. Spinach, turnips, and ladyfingers were the major contributors to this trend.

Table VI.9

AVERAGE ANNUAL AREA AND PRODUCTION OF VEGETABLES

Area = Hectare Production = Metric Tons

Vegetables	1975-80		1981-85		1985-90	
	Area	Prod.	Area	Prod.	Area	Prod.
Rabi Seasons						
1. Turnips	7	52	122	896	374	1280
2. Spinach	2	13	20	9	332	1727
3. Radishes	8	56	64	448	NR	NR
4. Onions	39	395	22	228	81	861
5. Chilies	-	-	50	62	50	62
6. Potatoes	-	-	30	381	34	425
7. Lady Fingers	26	183	28	213	166	1280
8. Tinda (gourd)	18	30	10	28	49	386
9. Brinjal (eggplant)	4	21	4	27	33	156
10. Pumpkins	13	42	3	10	17	75
11. Bittergourds	-	-	2	14	29	133
12. Bottlegourds	7	31	4	16	29	160
13. Tomatoes	4	27	9	52	80	520
All Vegetables	128	1245	368	2383	1274	9140

Source: Based on Tables VI.9.1 to VI.9.13

Table-VI.9.1

AREA AND PRODUCTION OF SPINACH IN BAJAUR AGENCY

Y e a r	Area (Hectares)	Production (Metric Tons)
1980-81	2	13
1981-82	4	2
1982-83	5	2
1983-84	30	12
1984-85	30	12
1985-86	30	15
1986-87	120	250
1987-88	430	2000
1988-89	430	2000
1989-90	340	2190
1990-91	340	2195

Source: Agricultural Statistics of NWFP: Department of Agriculture.

Table VI.9.2

AREA AND PRODUCTION OF RADISHES IN BAJAUR AGENCY

Year	Area (Hectares)	Production (Metric Tons)
1975-76	-	-
1976-77	-	-
1977-78	-	-
1978-79	-	-
1979-80	1	7
1980-81	7	49
1981-82	10	70
1982-83	10	70
1983-84	100	700
1984-85	100	700
1985-86	100	700
1986-87	-	-
1987-88	-	-
1988-89	-	-
1989-90	-	-
1990-91	-	-

Source: Agricultural Statistics of NWFP: Department of Agriculture.

Table VI.9.3

AREA AND PRODUCTION OF TOMATOES IN BAJAUR AGENCY

Year	Area (Hectares)	Production (Metric Tons)
1975-76	2	13
1976-77	1	7
1977-78	1	7
1978-79	-	-
1979-80	-	-
1980-81	-	-
1981-82	-	-
1982-83	-	-
1983-84	20	120
1984-85	23	138
1985-86		
1986-87		
1987-88	100	500
1988-89	100	650
1989-90	100	650
1990-91	100	800

Source: Agricultural Statistics of NWFP: Department of Agriculture.

Table-VI.9.4

AREA AND PRODUCTION OF TURNIPS IN BAJAUR AGENCY

Year	Area (Hectares)	Production (Metric Tons)
1975-76	-	-
1976-77	-	-
1977-78	-	-
1978-79	-	-
1979-80	2	15
1980-81	5	37
1981-82	5	37
1982-83	6	44
1983-84	200	1466
1984-85	200	1465
1985-86	200	1470
1986-87	150	1470
1987-88	430	3360
1988-89	430	3400
1989-90	430	3550
1990-91	430	3555

Source: Agricultural Statistics of NWFP: Department of Agriculture.

Table VI-9.5

AREA, TOTAL PRODUCTION AND YIELD OF ONIONS IN BAJAUR AGENCY

Year	Area (hectares)	Production (Metric Tons)	Yield/Hectares (Metric Tons)
1975-76	33	325	9.85
1976-77	33	325	9.85
1977-78	40	406	10.15
1978-79	40	408	10.20
1979-80	50	510	10.20
1980-81	16	163	10.19
1981-82	18	183	10.17
1982-83	10	102	10.20
1983-84	30	306	10.20
1984-85	38	387	10.18
1985-86	52	530	10.19
1986-87	52	530	10.19
1987-88	100	1020	10.20
1988-89	100	1025	10.25
1989-90	100	1200	12.00

Source: Agricultural Statistics of NWFP: Department of Agriculture.

Table VI.9.8

AREA AND PRODUCTION OF BITTERGOURDS IN BAJAUR AGENCY

Year	Area (Hectares)	Production (Metric Tons)
1983-84	4	24
1984-85	4	24
1985-86	4	24
1986-87	4	24
1987-88	35	170
1988-89	35	160
1989-90	35	160
1990-91	35	150

Source: Agricultural Statistics of NWFP: Department of Agriculture.

Table VI.9.9

AREA AND PRODUCTION OF BOTTLEGOURDS IN BAJAUR AGENCY

Year	Area (Hectares)	Production (Metric Tons)
1975-76	1	7
1976-77	-	-
1977-78	-	-
1978-79	2	8
1979-80	2	8
1980-81	2	8
1981-82	2	8
1982-83	2	7
1983-84	6	21
1984-85	6	21
1985-86	6	21
1986-87	4	21
1987-88	35	180
1988-89	36	200
1989-90	36	200
1990-91	36	200

Source: Agricultural Statistics of NWFP: Department of Agriculture.

Table VI.9.10

AREA AND PRODUCTION OF BRINJAL (EGGPLANT) IN BAJAUR AGENCY

Year	Area (Hectares)	Production (Metric Tons)
1975-76	2	6
1976-77	-	-
1977-78	-	-
1978-79	-	-
1979-80	-	-
1980-81	2	15
1981-82	3	22
1982-83	3	22
1983-84	4	29
1984-85	4	30
1985-86	4	30
1986-87	4	30
1987-88	40	150
1988-89	40	200
1989-90	40	200
1990-91	40	200

Source: Agricultural Statistics of NWFP: Department of Agriculture.

Table VI.9.11

AREA AND PRODUCTION OF PUMPKINS IN BAJAUR AGENCY

Year	Area (Hectares)	Production (Metic Tons)
1975-76	-	-
1976-77	2	6
1977-78	2	6
1978-79	3	10
1979-80	3	10
1980-81	3	10
1981-82	3	10
1982-83	3	10
1983-84	3	10
1984-85	3	10
1985-86	3	10
1986-87	3	10
1987-88	20	100
1988-89	20	80
1989-90	20	85
1990-91	20	100

Source: Agricultural Statistics of NWFP: Department of Agriculture.

Table VI.9.12

AREA, TOTAL PRODUCTION AND YIELD OF CHILLIES IN BAJAUR AGENCY

Year	Area (Hectares)	Production (Metric Tons)	Yield/Hectares (Metric Tons)
1984-85	50	62	1.24
1985-86	50	62	1.24
1986-87	50	62	1.24
1987-88	50	62	1.24
1988-89	50	62	1.24
1989-90	50	60	1.20

Source: Agricultural Statistics of NWFP: Department of Agriculture.

Table VI.9.13

AREA, TOTAL PRODUCTION AND YIELD OF POTATOES IN BAJAUR AGENCY

Year	Area (Hectares)	Production (Metric Tons)	Yield/Hectares (Metric Tons)
1984-85	30	381	12.7
1985-86	30	380	12.7
1986-87	35	440	12.6
1987-88	35	440	12.6
1988-89	35	440	12.6
1989-90	-	-	-

Source: Agricultural Statistics of NWFP: Department of Agriculture.

Table VI.10

AREA UNDER SELECTED VEGETABLES
IN BAJAUR AND WHOLE OF FATA: 1986-87

Vegetables	Area		
	FATA (hectares = 100)	Bajaur	
		hectare	3 as % of 2
1	2	3	4
1. Ladyfingers	135	30	22.22
2. Tomatoes	518	23	4.44
3. Potatoes	520	30	5.77
4. Turnips	280	150	53.57
5. Spinach	122	120	98.36

Source: FATA Development Statistics: 1988-89

8. PULSES

Among the pulses, masoor (lentils) is the most important with hectrage and tonnage reaching four figures. No other hectrage/ tonnage exceeds two digits. Relevant data for masoor (lentils), mash (black gram), and mong (mung bean) is given in Tables VI.11 to VI.13 as summed up below in Table VI.14

Table VI.14

AVERAGE ANNUAL AREA AND PRODUCTION OF PULSES
IN BAJAUR AGENCY: SUMMARY STATISTICS

Area = Hectares
Production = Metric tons

Pulses	1975-80		1980-85		1985-90	
	Area	Production	Area	Production	Area	Production
1. Masoor	5.7	5.25	322	208	2678	1382
2. Mash	-	-	30	15	24	15
3. Mong	-	-	40	22	30	21
4. Total	5.7	5.25	392	245	2732	1418

Source: Based on Tables VI.11-13.

Masoor cultivation increased dramatically after 1985-86. In the latter year it was cultivated over a total area of 780 hectares (Table-VI.11). In 1986-87 the area increased to 4,000 hectares, all irrigated, and stayed at that level until 1989-90. The total production of this crop was 505 MT in 1985-86. In 1989-90 the corresponding figure was 2110 MT. Masoor is one of the most important exports of this Agency, whereas mash and mong are all consumed locally.

Table-VI.12

AREA AND PRODUCTICN OF MASOOR IN BAJAUR AGENCY

Y e a r	Area			Production		
	Irri.	Un-Irri.	Total	Irri.	Un-Irri.	Total
1975-76	2.5	-	2.5	*	-	*
1976-77	3	-	3	2	-	2
1977-78	6	-	6	5	-	5
1978-79	7	-	7	6	-	6
1979-80	10	-	10	8	-	8
1980-81	17	-	17	11	-	11
1981-82	17	-	17	11	-	11
1982-83	17	-	17	11	-	11
1983-84	780	-	780	504	-	504
1984-85	780	-	780	503	-	503
1985-86	780	-	780	505	-	505
1986-87	4000	-	4000	2000	-	2000
1987-88	4000	-	4000	2000	-	2000
1988-89	4000	-	4000	2010	-	2010
1989-90	4000	-	4000	2000	-	2000

* = Negligible

Source: Agricultural Statistics of NWFP: Department of Agriculture.

Table-VI.13

AREA AND PRODUCTION OF MONG IN BAJAUR AGENCY

Y e a r	Area			Production		
	Irri.	Un-Irri.	Total	Irri.	Un-Irri.	Total
1984-85	30	-	30	15	-	15
1985-86	30	-	30	15	-	15
1986-87	30	-	30	15	-	15
1987-88	20	10	30	10	5	15
1988-89	20	10	30	12	3	15
1989-90	20	10	30	11	4	15
1990-91	20	10	30	11	4	15

Source: Agricultural Statistics of NWFP: Department of Agriculture.

Table-VI.14

AREA AND PRODUCTION OF MASH IN BAJAUR AGENCY

Year	Area			Production		
	Irri.	Un-Irri.	Total	Irri.	Un-Irri.	Total
1984-85	40	-	40	22	-	22
1985-86	-	-	-	-	-	-
1986-87	-	-	-	-	-	-
1987-88	30	10	40	17	5	22
1988-89	30	10	40	17	5	22
1989-90	30	10	40	16	4	20
1990-91	30	10	40	17	4	21

Source: Agricultural Statistics of NWFP: Department of Agriculture.

9. FODDER

Fodder crops are grown both in the Rabi and Kharif season. Shaftal and Berseem are grown entirely to feed livestock. Barley and maize are also used as fodder. If the wheat grain formation fails, then this crop too gets used as fodder.

Shaftal was cultivated over an area of 2000 hectares all irrigated, in 1987-88. Then the area declined steeply to 100 hectares in 1988-89 and never rose beyond that level (Table VI.15). The production statistics show the same trend. A reported printing error rather than an actual upswing/downswing appears to be a plausible explanation of this erratic behaviour.

Table-VI.15

AREA AND PRODUCTION OF SHAFTAL IN BAJAUR AGENCY

Year	Area (irrigated)	
	Hectares	Metric Tons
1984-85	30	350
1985-86	30	350
1986-87	30	350
1987-88	2000	24000
1988-89	100	1500
1989-90	100	1500
1990-91	100	1500

Source: Agricultural Statistics of NWFP: Department of Agriculture.

In the Kharif season, maize is grown both for use as fodder and for grains. No statistics are available for maize fodder area and production for the pre-1987 period. In 1987-88, maize for fodder was grown over an area of 200 hectares, with a total production of 2800 MT. The number of hectares declined to 130 hectares in 1988-89 with a production level of 1850 MT. In 1989-90, the production was 1850 MT for a hectarage of 130 acres.

10. ORCHARD CROPS

Fruit production, though presently on a limited scale, is gaining ground in Bajaur Agency. During the quiquennium 1975-80, fruit cultivation accounted for about 24 hectares annually on the average. The 1985-90 corresponding figure is 289 hectares, indicating a 12-fold increase.

Table-VI.16

AVERAGE ANNUAL FRUIT AREA AND PRODUCTION
IN BAJAUR AGENCY 1975-90

Fruit	Average annual					
	Area (hectares)			Production (M.Tones)		
	1975-80	1980-85	1985-90	1975-80	1980-85	1985-90
1. Citrus	10.8	42.4	106	54.4	215.8	467.6
2. Apricots	4.0	11.0	36.4	60.0	113.2	344.6
3. Apples	2.5	16.2	44.4	43.5	279.6	586.4
4. Figs	-	2.0	8.0		34.0	100.6
5. Pears	1.3	3.0	6.8	24.3	63.0	73.8
6. Peaches	2.0	2.8	19.6	2.0	2.8	200.2
7. Plums	3.3	26	68.0	27.0	208	622
TOTAL	23.9	103.4	289.2	211.2	916.4	2435.2

Source: Based on Tables VI.16.1 to 16.7.

Bajaur produces high quality malta (oranges) which has a good market locally as well as outside the Agency. The citrus area officially reported, as well as that of other fruits, seems to err on the lower side. A large number of orchards and diffused plantations have sprung up in the area. The size of citrus supplies in the local market, and of the outbound citrus consignments, suggest that the area and production of this fruit must be much more than what the statistics indicate. Leaving aside the question of accuracy of area statistics, the important thing is that citrus is growing in popularity. Interviews with the farmers suggested that the limit to the area under citrus is due more to nursery plant supply, and know-how factors than its marketability.

Apple cultivation is not doing well. Although the apple area has increased from an insignificant two hectares in 1978-79 to 60 hectares in 1989-90, (see table VI.16.3) and the estimated production from 35 MT to 736 MT during the same period, farmers and agricultural experts do not predict a bright future for this fruit because of local climatic conditions which are not favourable to its growth. The introduction of new varieties can help overcome this problem, but alternative varieties do not presently enjoy much acceptability in the area.

Plum, peach, and apricot production, too, has increased appreciably in recent years. In terms of hectarage the progress is not very remarkable, but the trends and the directions are. Fifteen years ago, these fruit plants were a relatively rare sight. Now there are a number of regular orchards in addition to diffused plantations which are producing positive effects in the horticultural sector's growth in the Agency.

In any scheme for the diversification of farming and the eradication of illicit crops, heavy emphasis would need to be placed on horticultural development. Fruit orchards fetch a good return if the harvest is normal, and this enterprise suits the temperament of most large landowners in the area.

Table-VI.16.1

AREA AND PRODUCTION OF CITRUS IN BAJAUR AGENCY

Year	Area (hectares)	Production (Metric Tons)
1975-76	8	39
1976-77	8	43
1977-78	11	53
1978-79	11	56
1979-80	16	81
1980-81	16	81
1981-82	16	81
1982-83	20	102
1983-84	80	408
1984-85	80	407
1985-86	80	408
1986-87	80	408
1987-88	100	512
1988-89	95	500
1989-90	95	510
1990-91	95	500

Source: Agricultural Statistics of NWFP: Department of Agriculture.

Table-VI.16.2

AREA AND PRODUCTION OF APRICOTS IN BAJAUR AGENCY

Y e a r	Area (hectares)	Production (Metric Tons)
1978-79	4	60
1979-80	4	60
1980-81	4	60
1981-82	10	150
1982-83	10	150
1983-84	10	100
1984-85	15	106
1985-86	16	106
1986-87	16	106
1987-88	50	500
1988-89	50	500
1989-90	50	511
1990-91	50	513

Source: Agricultural Statistics of NWFP: Department of Agriculture.

Table-VI.16.3

AREA AND PRODUCTION OF APPLES IN BAJAUR AGENCY

Y e a r	Area (hectares)	Production (Metric Tons)
1978-79	2	35
1979-80	3	52
1980-81	10	173
1981-82	15	259
1982-83	15	259
1983-84	20	345
1984-85	21	362
1985-86	21	362
1986-87	21	362
1987-88	60	740
1988-89	60	732
1989-90	60	736
1990-91	60	736

Source: Agricultural Statistics of NWFP: Department of Agriculture.

Table-VI.16.4

AREA AND PRODUCTION OF FIGS IN BAJAUR AGENCY

Y e a r	Area (hectares)	Production (Metric Tons)
1981-82	2	34
1982-83	2	34
1983-84	2	34
1984-85	2	34
1985-86	2	34
1986-87	2	34
1987-88	12	144
1988-89	12	143
1989-90	12	148
1990-91	12	148

Source: Agricultural Statistics of NWFP: Department of Agriculture.

Table-VI.16.5

AREA AND PRODUCTION OF PEARS IN BAJAUR AGENCY

Y e a r	Area (Hectares)	Production (Metric Tons)
1977-78	1	10
1978-79	1	21
1979-80	2	42
1980-81	2	42
1981-82	2	42
1982-83	2	42
1983-84	4	84
1984-85	5	105
1985-86	5	105
1986-87	5	105
1987-88	8	69
1988-89	8	10
1989-90	8	80
1990-91	8	80

Source: Agricultural Statistics of NWFP: Department of Agriculture.

Table-VI.16.6

AREA AND PRODUCTION OF PEACHES IN BAJAUR AGENCY

Y e a r	Area (Hectares)	Production (Metric Tons)
1978-79	2	2
1979-80	2	2
1980-81	2	2
1981-82	2	2
1982-83	2	2
1983-84	4	4
1984-85	4	4
1985-86	4	4
1986-87	4	4
1987-88	30	330
1988-89	30	330
1989-90	30	333
1990-91	30	333

Source: Agricultural Statistics of NWFP: Department of Agriculture.

Table-VI.16.7

AREA AND PRODUCTION OF PLUMS IN BAJAUR AGENCY

Y e a r	Area (hectares)	Production (Metric Tons)
1977-78	1	9
1978-79	1	24
1979-80	6	48
1980-81	10	80
1981-82	20	160
1982-83	30	240
1983-84	35	280
1984-85	35	280
1985-86	35	280
1986-87	35	280
1987-88	90	900
1988-89	90	960
1989-90	90	890
1990-91	90	890

Source: Agricultural Statistics of NWFP: Department of Agriculture.

C. Farm Power

The use of farm machinery is rapidly increasing in Bajaur Agency as well as in other parts of FATA. The machines gaining most in popularity are tractors, threshers, maize shellers, and rice husking machines. According to Agricultural Statistics of NWFP, 1989-90 (issued by the Department of Agriculture, NWFP), there were 239 tractors, 25 wheat threshers, 29 rice husking machines, and 18 maize shellers in Bajaur Agency in 1989-90. In 1984 only 34 tractors were counted under the Census of Agricultural Machinery undertaken in that year. It is believed that these statistics heavily err on the low side. The Agency is thought to possess many more of these machines, in addition to many tractors and wheat threshers which are rented from outside the Agency.

Reports on trends in the use of farm power gathered from the Agriculture Department's officers and the farmers indicate that mechanization is strongly increasing. Tractors are replacing or supplementing bullocks. Wheat threshing is done largely by threshers. A similar, though weaker trend can be seen for maize shelling and rice husking by machine. The use of animal power is declining, but it is unlikely that machines will replace them completely in the foreseeable future, because not all farmers are able to get tractors/threshers at the time these are needed. The sample farmers reported that they would prefer to use wheat threshers for all wheat threshing, but were unable to do so because of the shortage of threshers at harvest time. The same applies to tractors. The use of bullocks continues to survive but their use is gradually declining.

In 1980, according to the Census of Agriculture conducted in that year, only three percent of farms used tractors, 84 percent used animals only, while the remaining 13 percent used animals as well as tractors for farming. In the 1992 survey for this study, no farmer was found using animals only in the main agricultural belt of Bajaur Agency. Because of the small sample, and the fact that the remote areas were not surveyed, the 'non-use' report on animal power may be not completely correct. In summary, it is safe to conclude that the use of 'animals only' for farm power presently must be in decline.

D. Farm Labour

The farm family itself provides almost all the labour required for farming. Farmers with hired labour represent only a small proportion of farm operators. The 1980 Census of Agriculture listed only 1105 households having 1670 permanent hired workers. The same source put the number of family workers working on their farms at 91,576 (full-time) and 14,393 (part time). Farm households must have employed some temporary workers on a cash wage or cash-cum-inkind payment basis, but the numbers would not be as high as the informal reports suggest. The 1992 survey of sample farmers found a negligible use of hired labour. Of the fifty

sample farmers surveyed, only three had used hired casual labour, while none had any permanent employees.

Women's participation in their household's farm work is substantial. The 1980 Census of Agriculture enumerated 56,145 women attending to their household's farms. They constituted 48 percent of the family labour. As many as 76 percent of these women were reported to be working full-time on their farms. This seems to be a misleading figure. It would be more realistic to say that 76 percent of women workers regularly attended to their household's farms in 1980. Although comparable data about the existing situation is not available, women's participation in the farming sector, as the informal reports suggest, does not seem to have undergone a substantial change after 1980 in terms of the participation rate or pattern. They care for livestock, and on agricultural farms, they are active participants in weeding, threshing, fodder cutting, and most post-harvest work. As elsewhere in the tribal agencies and Pakistan in general, in Bajaur most women of all ages go out to work in the fields. In areas close to roads, women's participation in farm work is minimal or even absent, whereas in in remote areas, it is more prominent. The social demands of purdah, and consideration for security largely explain this pattern.

No serious shortage of labour is reported in the Agency. The current off-season wage rate is Rs 30-35 per day with a peak season rate at Rs 40-50 per day. These are more or less equal to those prevailing in the adjacent settled areas.

E. Agriculture Inputs and Services

The awareness of the importance of improved seed, chemical fertilizers, and agro-chemicals is found widely among the Agency's farmers. All the landowners and farmers contacted for this study mentioned these inputs and services in their list of problems, i.e.; they desired that the supply situation of these inputs should be improved.

1. Improved Seed

There are no sale points in the Agency for improved seed. The only source is the Agriculture Department which provides it to farmers for demonstration purposes. The contact farmers may then sell improved seed to other farmers. It is not understood why the use of improved seed is propagated through demonstration plots, but its regular open sale is not arranged through the Agency.

As stated above, the Agriculture Department provides seed for demonstration plots. The quantity by crop provided during 1979-80 and 1988-89 is given in Table VI.17.

Table-VI.17

IMPROVED SEED DISTRIBUTED BY AGRICULTURE DEPARTMENT IN BAJAUR AGENCY FOR DEMONSTRATION PURPOSES DURING 1979-80 THROUGH 1988-89

Crop	Improved Seed Distributed:		Average annual distribution of improved seed	
	1979-80 (Kg)	1988-89 (Kg)	Kg.	Period
1. Wheat	30,000	76,000	51,600	(1979-89)
2. Maize	9,000	54,000	32,700	(1979-89)
3. Sunflower	40	160	118	(1979-89)
4. Soyabean	-	240	160	(1984-89)
5. Rape & Mustard	30	138	67	(1978-89)
6. Mong/Mash pulses	-	276	103	(1984-89)
7. Groundnuts	-	400	104	(1980-89)

Enough relevant information is not available presently to warrant an objective recommendation as to the induction of the private sector in improved seed supply in the Agency, or about the relaxation/removal of the permit requirement for its import. However, the existing medium, i.e., the Agriculture Extension Department needs to and can be mobilized for a much wider and quicker distribution and use of this important input.

2. Fertilizer

The use of chemical fertilizers is wide spread in the farm sector in this Agency. In 1980, as many as 83 percent of the farms used both fertilizers and manure, 14 percent used only manure, and the rest used only chemical fertilizers. Presently, as revealed by the sample survey and informal interviews, all farmers use chemical fertilizers and the percentage share of farmyard manure is declining. The quantities of fertilizers used are, however, much less than the recommended dosage and the application methods are also not as they should be.

The Agency has six fertilizer dealers. It imports 24,000 bags a month of this input. The officially fixed prices were:

Product	Rate (Rs/bag)
- Urea 50 Kg	190
- Urea 23 Kg	54
- CAN	79
- NF	149
- AS	68
- SSP (P) 18%	54
- SSP (P) 16%	50
- SSP (G) 18%	58
- SSP (G) 16%	54
- DAP	249
- SUA	85
- TSP	147
- NPK (10:20:20)	128
- NPK (13:13:21)	117

The dealers allegedly overcharge for most kinds of fertilizers. It is also alleged that urea is passed on as DAP in order to make a profit, but to the great detriment of the farmers. The problems of price, supply, and quality of fertilizers would be minimised if the Agricultural Development Authority (ADA) itself arranged for fertilizer sales through the Agency. Or better still, in addition to private dealers, the ADA itself would handle part of the fertilizer distribution.

3. Agro-Chemicals

The 1980 Census of Agriculture found only three percent of the Agency's farmers using insecticides. The existing situation should be better because of the Agriculture Department's extension activities. The farmers in the Agency are not satisfied with the agro-chemical supply situation, but there are indications that their demand is on the rise despite a rise in prices, implying that they are more widely used than before.

Agro-chemicals are sold by private dealers. The Agriculture Department sells hand compression sprayers at a 50% subsidy, and also arranges crop sprays on payment. During 1979-80 through 1987-88, the Agriculture Department sold 245 hand sprayers to the farmers. It could not be ascertained how extensively and effectively these sprayers were being used by the farmers.

For plant protection materials and services (other than spray pumps) provided to the farmers, the Agriculture Department recovered Rs 108,642 annually on the average during 1983-84 through 1990-91. Relevant data by year is given in Table-VI.18.

Table-VI.18

RECOVERY OF PLANT PROTECTION COSTS FROM THE FARMERS BY THE AGRICULTURE DEPARTMENT, BAJAUR AGENCY 1983-84 THROUGH 1990-91

(Rupees)

Year	Amount recovered
1983-84	51,298.00
1984-85	103,660.00
1985-86	63,739.00
1986-87	105,881.00
1987-88	88,219.00
1988-89	132,066.00
1989-90	177,615.00
1990-91	146,656.00

The agrochemical supply and price situation is, on the whole, discouraging from the farmers point of view. They are not easily available, and the prices are soaring. The Agriculture Department is a source of some relief in this respect, but the resources at its disposal are rather negligible.

Equally important is the farmers' problem of lack of know-how in using chemicals. The findings of the field interviews suggest that the farmers are easily stymied in knowing which type of chemical to use, where to purchase it, and the economics of chemical use. This problem area can be competently tackled only by a possible collaboration between the Agriculture Extension Department and the NWFP Agricultural University.

4. FATA Agriculture Extension Department

The head office of FATA Agriculture (Extension) Department is located in Khar. It has sub-offices in various parts of the Agency. The staffing position of these offices is given in Table VI.19.

Table-VI.19

STAFF OF FATA AGRICULTURE (EXTENSION) DEPARTMENT

Post	Number	Place of posting
1. Extra Assistant Director	1	Khar
2. Agricultural Officers	4	One each at Khar, Nawagai, Mamund, Salarzai
3. Agricultural Inspectors	3	One each at Khar, Salarzai, Nawagai
4. Field Assistants	14	Various places in the Agency
5. Other Staff	47	Khar and field offices
Total	69	

The four Agricultural Officers posted in Bajaur Agency are assisted by fourteen Field Assistants and other staff. They attend to a total population of 287,000 (Table-VI.20).

Table-VI.20

LOCATION OF AGRICULTURAL OFFICERS' OFFICES AND THE POPULATION OF THE RESPECTIVE CIRCLES

Agricultural Officers' Circle	Population
1. A.O. Khar	112000
a. F.A. Khar	49000
b. F.A. Maranosha	12000
c. F.A. Arang	40000
d. F.A.Kulala	11000
2. A.O.Nawagai	40000
a. F.A. Nawagai	18000
b. F.A. Loysum	22000
3. A.O. Mamund	63500
a. F.A. Tarkho	35000
b. F.A. Sewai	28500
4. A.O. Salarzai	56300
a. F.A. Raghagan	14300
b. F.A. Pashad	30000
c. F.A. Gung	12000
TOTAL =	271800

The Agriculture Department has been playing a positive role, though on a limited scale, in the agricultural development of the Agency. Its extension activities have been instrumental in inducing cropping pattern changes as well as improvements in yield, but it could and should do a lot more. Contacts between extension workers and the farmers are very limited. Most farmers are unaware of the recommended levels of improved input use, improved cultivating practices, and the sources of information relevant to farming. The extension staff is, on the other hand, seriously handicapped in the matter of transport, supply of inputs for demonstration, publicity material etc. There are no monetary incentives for undertaking arduous field duties.

The reorganization and strengthening of this department is a pressing necessity. Without an efficient extension service nothing substantial can be achieved from development outlays. The investment made in tubewells is a case in point. Proper attention to the tubewell irrigated locations could radically transform the affected farms. It would be a worthwhile exercise to evaluate the existing extension system in this Agency as well as in others, and inquire into the need and possibilities for its reorganization.

5. Government Nurseries and Demonstration Plots

The fruit nurseries and the crop demonstration plots established by the Agriculture Department have been playing an important role in the agricultural development of Bajaur Agency. The activity in this sphere is organized on a limited scale presently; there are at present only two fruit nurseries, and in 1990-91 only 76 demonstration plots were established. In the farm sector there is a demand for a further and faster expansion of these activities.

a) Fruit Tree Nurseries

As stated above there are two fruit tree nurseries, one in Inayatkilli and one in Pashad occupying 5 acres and 3.5 acres respectively. The Pashad nursery supplied 25,135 trees to farmers during 1990-91. During 1978-91, the nursery at Inayatkilli supplied 17,719 trees a year on the average fetching Rs 1.13 per tree (Table-VI.21); the average for 1989-90 is Rs 2.00 per tree.

Table-VI.21

FRUIT TREES DISTRIBUTED FROM INAYATKALAY NURSERY

Year	Trees Distributed (No.)	Amount recovered (Rs.)
1978-79	520	26
1979-80	9000	2959
1980-81	19583	1535
1981-82	8961	4938
1982-83	13362	7799
1983-84	16513	11157
1984-85	17200	11463
1985-86	23196	16473
1986-87	22380	18788
1987-88	19021	63828
1988-89	22047	56480
1989-90	20570	42124
1990-91	20276	-

The breakdown of trees distributed by the two nurseries during 1990-91 is given below:

	Inayatkalay	Pashad
1. Apples (local)	1534	1400
2. Apples (dwarf)	600	-
3. Pears	1300	340
4. Peaches	3000	2355
5. Plums	4378	4720
6. Apricots	3880	6500
7. Almonds	964	3780
8. Walnuts	4560	2678
9. Walnut Budded	-	180
10. Cherries	-	80

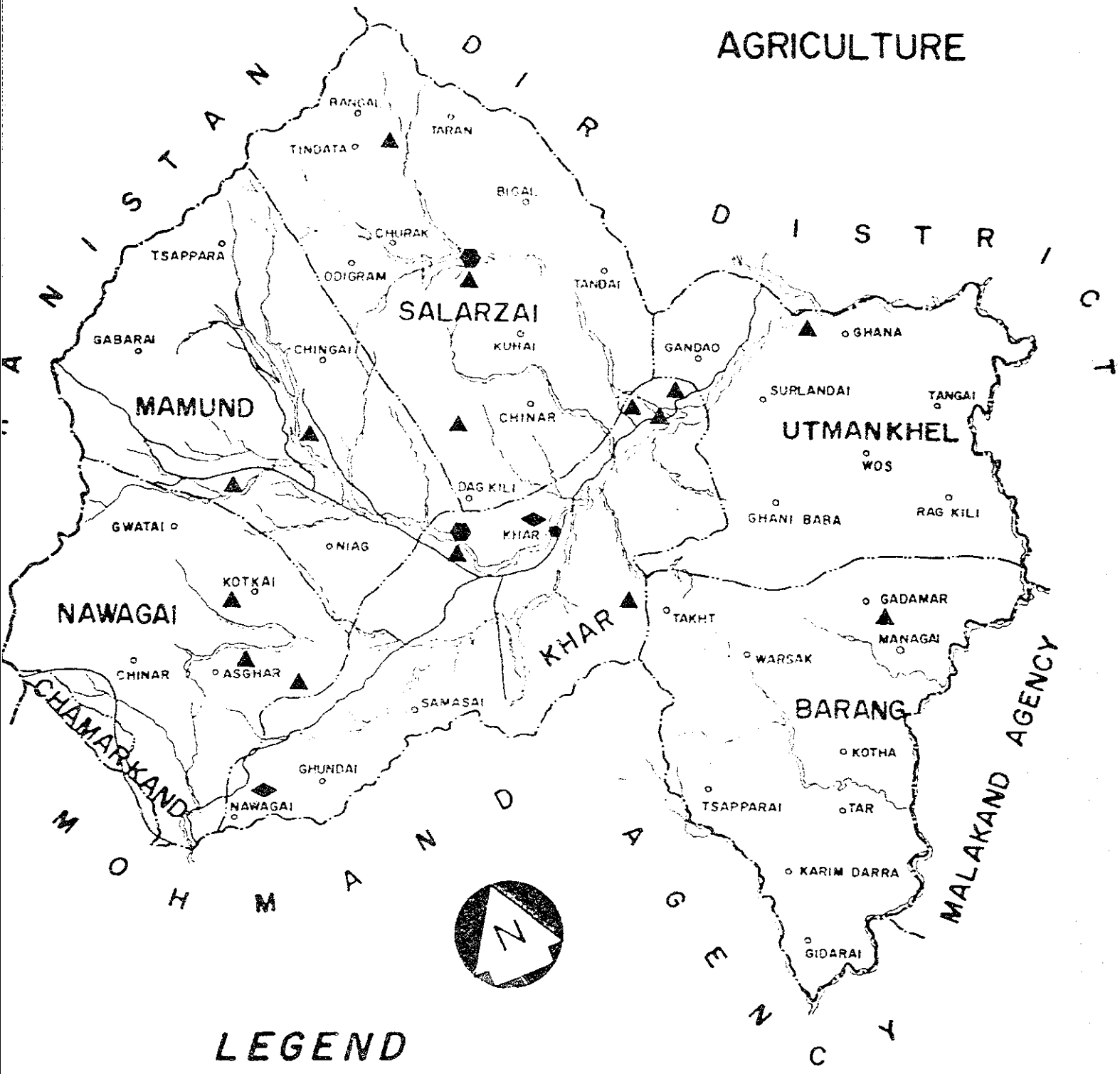
b) Demonstration Plots

The laying of demonstration plots is a regular feature of the Agriculture Department's extension activities. During 1990-91, 266 demonstration plots were laid, all in Salarzai Tehsil. Their distribution was:

Crop	Demonstration Plots No.
- Maize	96
- Sunflowers	18
- Paddy Rice	36
- Wheat	116

BAJAUR AGENCY

MAP # VI.1



LEGEND

- INTERNATIONAL BOUNDARY
- TRIBAL BOUNDARY
- TEHSIL BOUNDARY
- EXISTING PAVED ROAD
- RIVER / STREAM / KHWAR
- AGENCY HEADQUARTER
- VILLAGES / TOWNS
- FRUIT NURSERIES
- AGRICULTURE OFFICERS, EADA

In the 1991 Kharif season, demonstration plots were laid over an area of 145 acres. The distribution by crop was:

- Maize 100 acres
- Sunflowers 34 acres
- Sorghum 11 acres

6. Credit

There is one branch of the Agricultural Development Bank of Pakistan (ADBP) and six branches of Commercial Bank in Bajaur Agency. Information on the number of loans and the amounts approved could not be collected from the ADBP branch in Khar/Bajaur. As gathered from the Census of Agriculture in 1981 and interviews with farmers for this study, institutional credit meets only a small fraction of total credit needs. In 1980, no household was recorded having borrowed from a credit institution, whereas the outstanding loans from non-institutional sources totalled Rs.3.8 million of which Rs.2.4 million were payable by owner households and the rest by owner-cum-tenant and tenant households.

Institutional credit is monopolized by landowners. Credit is extended for the purchase of agricultural machinery, land development, etc. A few incidents came to the research team's notice where tractors purchased on credit were sold and cars were purchased with the funds instead. There is nothing new or surprising about this practice.

No farmer interviewed for this study mentioned credit as a problem. Institutional credit, infact, is not very popular with farmers in this Agency, as is also the case elsewhere. The traditional non-institutional sources are unlikely to recede in importance in the foreseeable future.

F. Agricultural Marketing

Khar is the largest central market for agricultural produce. The other important markets are located in tehsil headquarter towns.

Cereals are normally sold by farmers at a farm gate to bulk purchasers (beoparis) and to village shopkeepers locally within the village. The proportion of cereals sold by farmers in the village in the central Mandi, and through other means is not known, but as ascertained from sample farmers and officials of the Agriculture Department, less than one fourth of the farmers themselves bring their cereals to the central market. The medium is the Beopari or/and the village-based shopkeeper.

The sale of fruit is made mostly before the harvest is ready. Normally, the whole orchard is sold (for a single harvest) to contractors who, in turn, sell the produce in the central mandi directly and/or through an intermediary.

Vegetables are brought to the Mandi by the farmers themselves. They

VII. WATER RESOURCE MANAGEMENT

The primary goal of planning the management of both surface and ground water resources for the public interest is the same. Both involve adequate water supply sources, their efficient utilization, and environmental protection. Nevertheless, surface water and ground water occur in quite different environments and thus management may differ in a fundamental way. There is a marked difference in the development of the two sources. Streams and rivers are the principal sources of surface water resources, while water beneath the ground accounts for ground water resources. Therefore, planning in conjunction with the rationalized development and integrated use of both surface and ground water resources is essential for the development of agriculture in Bajaur Agency.

In order to plan and develop the surface water resources, a hydrometereological database spanning several years is essential. At present, such data is not available. Therefore, for the planning and management of water resource development in Bajaur Agency, stations for rainfall, evaporation, and stream flow records must be established for a continuous flow of data. To evaluate the present water resource sector for socio-economic development in Bajaur Agency, the development of ground water and surface water resources will be discussed below:

A. Ground Water

1. Ground Water Reservoirs in Bajaur Agency

"How much ground water is available in Bajaur Agency?" is a question most frequently raised by planners when new development schemes for ground water are initiated for implementation. Certainly, different development plans may influence the yield potential of the supply, impact on ground water reservoirs, or the interconnected surface water and depletion of the ground water table.

Evaluating the potential of the groundwater reservoirs in Bajaur Agency necessitates an effort to estimate the recharge and discharge of the groundwater reservoir. In Bajaur Agency, ground water recharge in different hydrologic basins is estimated based on limited available data. The available data on the discharge of withdrawal from tubewells and the runoff from the existing streams is compared with the recharge from precipitation/snow melt in the area.

To analyse the total ground water budget, Bajaur Agency is divided into five sub-hydrogeologic zones, each having common characteristics; these aquifers which have been formed by similar geologic processes are:

1. Seiko zone
2. Watalai zone
3. Raghagan zone
4. The Bartras and the Alizai zone
5. The Arong zone
6. The Barong zone

Each sub-hydrological basin has a major stream; the discharge of the streams and the catchment area is shown in Table-VII.1.

The base flows of the above three streams, i.e., Seiko, Watalai, and Raghagan are based on daily measurements of stream gauges by the FATA-DC staff for the last two years. The total outflow is 108 cusec, i.e., 78,000 acre-feet annually which joins the Bajaur stream and ultimately meets the Jandul river.

Table VII.1

CATCHMENT AREA OF BAJAUR AGENCY

	Name of Hydrological basins	Catchment Area	Discharge of stream
i.	Seiko basin	110 sq. mile	37 Cusec *
ii.	Watalia "	100 sq. mile	34 "
iii.	Raghagan "	120 " "	34 "
iv.	Bartras & Ali Zai	60 " "	5 " **
v.	Arong drainage basin	80 " "	30 " **
vi.	Barong " "	120 " "	45 " **
	Total:	590 sq. mile	185 Cusec

* Source FATA-DC
** Estimated

The streams in Alizai, Arong and Barong drainage zones, however, have not been measured by any line agency due to the non-accessibility of the area. The cultivable area in the three western basins is large compared to the last three eastern basins of Bajaur Agency. The total outflow from the perennial stream is estimated at 170 cusec, i.e., 0.124 million acre-feet annually from a catchment area of 590 sq. miles.

The slope of Bajaur Agency is from west to east with the mountains sloping towards the Bajaur Khawar. Therefore, all the runoff from precipitation is drained by the tributaries of the Bajaur Khawar. The flood is of lesser duration and more highly intensive due to the excessive slopes. The banks of the khawars are washed away near Khar city and the Mutakao area of Bajaur Agency from monsoon floods.

1. Seiko zone
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3. Raghagan zone
4. The Bartras and the Alizai zone
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The average rainfall of 26 inches, in addition to snowfall in the project area is a major source of surface and ground water in Bajaur Agency. There is a lack of observation wells for the measurement of aquifer yield in the area. Therefore, inflow and outflow calculations will be used to estimate the ground water potential of the six drainage basins independently. The evapo-transpiration index for the months of December to April is less than average precipitation. Therefore, the recharge to groundwater is significantly greater for the months of May to July. During the monsoon season, the recharge to ground water is greater when rainfall exceeds the bench mark of the evaporation index of 0.28" per day. Assuming 20%* of rainfall as recharge to ground water, the yield for all six basins of Bajaur Agency is shown in Table-VII.2. The general movement of groundwater in Bajaur Agency is from west to east.

* Estimated

Table VII.2

GROUNDWATER INFLOW OF BAJAUR AGENCY

S.No.	Description of Sub-Hydrological Zone	Groundwater recharge from precipitation/ snow melt
i.	Seiko Unit	49 Cusec *
ii.	Watalai "	47 "
iii.	Raghagan "	45 "
iv.	Alizai + Bartras Plains	24 "
v.	Arong " "	30 "
vi.	Barong " "	45 "
	Total =	223 Cusec

* Cubic feet per second

The recharge to ground water from precipitation is equal to 0.16 million acre-feet annually. A portion of this flow is exfiltrated at different places in the form of springs which join the main stream of Bajaur Agency. The ground water estimated budget for Bajaur Agency is given in Table-VII.3.

able VII.3

GROUND WATER BUDGET

.No.	Description of sub-hydrological zone	Groundwater Recharge cfs.	Groundwater Extractions (Tubewells) cfs.	Discharge of Streams (Spill) cfs.
.	Seiko unit	49 cusec]	]	37 cusec
.	Watalai unit	47 "]	25 *]	34 "
.	Raghagan unit	45 "]	]	34 "
.	Alizai+Bartras unit	24 "]	15 *]	5 "
.	Aron	30 "	-	30 ** cusec
.	Barong	45 "	-	45 ** cusec
	Total:	240 cusec	40 *	185 cusec

Recharge = 240 cusec
Discharge = 40+185 = 225

* Groundwater utilization at 50% utilization due to load shedding.
** Estimated

The ground water supply installed capacity through 140 tubewells from the Seiko, the Watalai and the Raghagan basins is 80 cusec. However, the actual pumpage with a 50%* utilization factor is 40 cusec. In order to find the surplus and the deficit supply in different zones, the utilization of tubewells is assumed at 100% with no account for seepage from irrigation.

The ground water extraction by tubewells in the Seiko and the Watalai zones is 50 cusec at 100% utilization. The total ground water storage is estimated at 79 cusec.

Similarly, the pumpage from ground water from the Raghagan and Bartras zones through tubewells is 30 cusec at 100% utilization. The discharge of 110 cusec in Seiko, Watalia and Raghan streams (khawars) respectively, can be attributed to snow melting and ground water exfiltrations from the northern catchment area of Bajaur agency. The total extraction plus spill in the stream is 150 cusec. The recharge from the precipitation and seepage from snow melt is equal to 165 cusec as shown in table VII.3. The above conclusion is based on assumptions and limited data. Adequate hydrologic data is required for the equation of hydrologic equilibrium.

The Watalai zone is in the upper portion of the alluvial fill and recon

cattered throughout the entire thickness and between beds of silt and lay. Stratification is so complex that accurate predictions of ground ater occurance can be made only after a detailed study with observation ells. Since observation wells have not been drilled, the extent of the ecline in the water table and the ground water storage cannot be ccurately determined. To achieve the maximum perennial yield in the atalia zone, the aquifer should be managed as a unit. Thus, the fficient and economic production of water requires that all pumping and istribution of water be done for the benefit of the largest manageable ystem.

2. The Present Non-Equilibrium of Water Tables in Bajaur Agency

The FATA-DC's annual report for 1989-90 on the monitoring of water levels indicates that the overall situation is satisfactory. In a few isolated patches of Watalai and Seiko, the hydrological basin water level has dropped in 25 tubewells. The reason for the non-equilibrium is that thin aquifers have been intercepted. Very little additional recharge can be induced from captured rainfall through artificial surface reservoirs or runoff directly induced into the aquifer. The only remedial measure being contemplated includes control on withdrawals and crop water management practices.

In more than 50% of the tubewells, gravel beds of larger thicknesses have been intercepted and therefore, no decline in the water table has been observed. In fact, in 25% of the tubewells, the water level has increased due to more recharge or less withdrawal for agricultural purposes. With proper management plus water conservation, such ground water reservoirs can be made to last from several decades to a few centuries.

The FATA-DC has been managing the ground water resources in Bajaur Agency. The hydrogeology directorate has measured the discharge and monitored water levels of the tubewells. Water distribution to the beneficiaries has also, been managed by the FATA-DC. After successful tubewell operations, the FATA-DC is faced with many requests for expansion to meet the growing demands. These decisions involve hydrologic considerations based on ground water principles. Groundwater is only one sub-system in hydrology and, hydrology is only one subsystem in the water resource planning and management. Bajaur Agency lacks a hydrometerological data base which in order to control the management of groundwater, is required for several years. Therefore, data collection and monitoring of the existing tubewells and hydrology of the area must be continued, and ground water management must be approached as but one integrated element of extensive land and water resource management efforts for future planning.

3. Groundwater Quality

Chemical data on ground water samples has been analyzed in the

uality of the fresh ground water supplies is satisfactory for all uses. Little or no treatment to improve the quality of water is necessary.

. Development of Irrigation with Tubewells

The FATA-DC has constructed 110 tubewells in the Bajaur plains. According to the FATA Agency statistics report of 1989, a total of 5903 hectares was irrigated by tubewells. The total area irrigated by different sources amounted to 11808 hectares. The development by ground water is approximately 50%. The 30 new, on-going ground water schemes are shown in Table VII.4 and VII.5. After the successful completion of these schemes, 3300 acres of dry-farmed land will be brought under irrigation. This will increase the present cropping intensity in Bajaur Agency from 100% to 150%.

. Dug Well/Open Well Irrigation

Open wells have been constructed in Bajaur Agency by UNHCR for Afghan Refugees. These wells are primarily for drinking purposes. The feasibility of open wells depends upon the depth of water beneath the ground in that area.

The general range of the water table is from 25 feet to 80 feet for an economically feasible open/dug well. Open wells can be developed in an area where ground water exfiltration is available at the above-mentioned depth. Wells up to 3400 gallons per hour (1/8 cusec) can be developed for irrigation purposes which will irrigate 15 acres of land.

In the Barong Tehsil, open wells can be developed for irrigated farming. Since electricity is not available, diesel operated pumps can be installed and handed over to the beneficiaries. The beneficiaries' participation in the operation and maintenance of the wells will reduce the concurrent costs. Therefore, open well irrigation will be economically feasible for the development of agriculture.

6. Water Management of Tubewells, Surface Irrigations and Rainfed Irrigation Systems

Presently, the input of water by tubewells and surface irrigation systems to the field are not properly managed. Under and over irrigation is the major problem to be managed by allocating water as required by the consumptive use method for different crops grown in the area.

There is also a need to change the traditional cropping system from low income to high income cash crops like fruit orchard crops and vegetables.

7. Precision Land Levelling

Land levelling in Bajaur Agency has not been practiced until now due to the financial constraints of the farmers. In order to increase irrigation efficiency, the fields need precision land levelling. This can be accomplished with government inputs while subsidizing the cost to the beneficiaries.

8. Water Course Lining and Construction

In nearly all 110 tubewells built by the FATA-DC, the water courses have not been built and lined. Therefore, an estimated 25% of the water is wasted through seepage losses. The water courses need lining to avoid the loss of water which is pumped at high costs. The construction of water courses with lining will increase the water supply.

There are a few isolated hydrological zones where ground water withdrawal will not affect the equilibrium of the underground reservoirs in the Agency. The Arong and Barong tehsils are such places where ground water resources can be developed. The ultimate boundaries of the ground water reservoirs have not been investigated as yet. The immediate development input will be to provide diesel operated pumps and motors of 2 H.P. capacity to lift water from perennial stream for 5-10 acres farms. Also, open/dug wells along the stream beds are alternate options for development with community participitation.

ble VII.4

Statement Showing Test/Tubewells Discharge Results

. Two Testwells in Salarzai Plain USAID Phase I

	Water Surface Level (Feet)	Draw Down (Feet)	Discharge (G.P.M)*
SL 222	81.0	41.0	18,000
SL 225	108.0	31.0	18,000

I. Three Testwells in Nawagai Plain (FATA-DC)

	Water Surface Level	Draw Down Feet	Discharge G.P.M
SL 227	136.0	12	6,000
SL 228	270.0	Lese discharge	
SL 229	228.0	112	7,140

III. Five Tubewells in Salarzai Plain Phase II

	Water Surface Level	Draw Down Feet	Discharge G.P.M	
SL 230	136.0	6.0	25,680)	USAID
SL 231	92.5	6.1	19,680)	
SL 234				
SL 237	122.0	18.2	16,680)	FATA-DC

IV. Four Tubewells in Bartras Plain USAID Phase II

	Water Surface Level	Draw Down Feet	Discharge G.P.M
BR 232	7.5	14.5	25,680
BR 233	64.5	89.5	18,120
BR 235	4.0	17.3	36,000
BR 236	in progress		

* G.P.M = Gallon Per Minute

Table VII.5

10 Tubewells under U.S. Narcotics Affairs System Schemes

	Water Surface Level (Feet)	Draw Down Feet	Discharge G.P.M
239 Mano Dehrai	90	125.7	7,140
240 Pandoki	145	45	12,000
241 Ali Zai	-	-	20,000
242 Tor Ghundi	150.6	96.6	6,000
243 Dak Qilla Artesion		Nil	24,000
244	-	-	-
245 Babar Shah	-	-	18,000
246	130	9.27	14,760
247	136.0	40.0	17,040
248 Khar	70.0	30.2	19,800

3. Surface Irrigation

1. Surface Irrigation Schemes in Bajaur Agency

Bajaur Agency has surface water resources of approximately 100 cusec. The main stream is the Bajaur Khawar and its tributaries, Watali, Seiko and Rachgan Khawars. The discharge of each khawar (stream) is given in Table-VII.1. The water supply in these streams is perennial.

The source of the water supply is water from snow melt, springs and the exfiltration of ground water. The precipitation of the area is 26 inches. Major floods occur during the winter and summer monsoons. Due to the excessive sloping of the beds from west to east, the storm runoff in periods of flood erodes the banks. The Bajaur Khawar, which at its starting point is only a few feet wide, has been widened several hundred feet in the middle portion due to the erosion of cultivated land. Therefore, precious cultivable land along the banks of the Bajaur Khawar is wasted every year, because the river banks are not protected.

The traditional irrigation system in Bajaur Agency was from rainfall farming (barani), and irrigated farming (through the diversion of floods by means of bunds). Poppy cultivation was the major cash crop and source of income for farmers. In sailaba, or flood-irrigated farming, the farmers diverted flood water from khawars (streams) and torrential runoff into their fields. Flood water flow from field to field leaves a certain depth of water in each field for soil saturation. A large number of farmers have constructed temporary gabions (without wire netting) as obstructions (intake structures) to draw in water for their cultivable land. Because of the uncertainty and irregularity of floods, however, fluctuations in high flood levels, considerable erosion and temporary bund breaches commonly occur.

The other major constraint to farmers in the above-mentioned system was that with each flood, the scouring of the stream beds occurs downstream from the obstructions. The level of available water dropped, and new intake structures were constructed upstream to control the land. The cost for maintenance of these structures was very high with respect to the production income of the farmers. The Bajaur Khawar flows at lower elevations than the cultivable lands. This level is approximately 5-20 feet in the western half of the valley. Where the difference of level has been found feasible to regulate the cultivable land, intake structures have been built by the FATA-DC for surface irrigation systems. Since 1973, ten irrigation schemes have been completed at a cost of Rs. 10.955 million.

The area under the control of the irrigation schemes is 2560 acres, with a designed discharge of 55 cusecs.

The average water supply design of these schemes is 46 acres/cusec. The water supply design as per the consumptive use is approximately 55 acres/cusec for Bajaur Agency, and is used primarily for high delta crops like sugarcane and rice.

2. Ongoing Surface Irrigation Schemes

Irrigation schemes constructed by the FATA-DC are permanent structures drawing water supplies for irrigation. Small dams have not been constructed as yet, due to the non-availability of a hydrological data-base for this agency.

At present, there are six on-going medium size irrigation schemes (FATA-DC), as shown in Table-VII.7. The estimated cost of completion of these schemes is Rs. 12.675 million. These schemes include flood protection measures, rehabilitation and the improvement of old schemes.

With the completion of these schemes, 1040 acres of land will be irrigated with 19 cusec of water. Lined conveyance channels have been constructed to avoid seepage losses in the main system which will improve the irrigation efficiency.

Table VII.8 shows the ground water and surface water schemes on-going and completed in Bajaur Agency with USAID and N.A.S. assistance. The seven schemes when completed will irrigate 3075 acres with a cost of Rs.23.768 million.

C. On-Going Lift Irrigation Schemes

Besides ground water and surface water irrigation schemes, lift irrigation schemes are also being constructed in Bajaur Agency. There are four lift irrigation schemes under construction as shown in Table-VII.9. The designed discharge of these lift schemes is 30 cusec which will irrigate 1800 acres of new land.

The Watalai, Seiko and Bajaur Khawars flow at lower elevations (up to 25 feet) from the level of the culturable control area. Therefore, lift schemes with diesel driven power pumps are a feasible option. Due to high maintenance costs, however, community participation is essential to lower the operating and maintenance costs. Presently, three schemes out of four are funded by N.A.S (U.S. Narcotics Affairs Section) with a cost of Rs. 10.12 million. The FATA-DC has constructed the Sultan Kuch lift irrigation scheme at a cost of Rs. 3.247 million. There is a great potential for more lift schemes with diesel operated pumps on the right bank of the Bajaur Khawar. The lift schemes shall be designed so that they irrigate 10-15 acres of land on both sides of the Bajaur Khawar.

D. Flood Protection Control

The major constraint in the agriculture development of Bajaur Agency is the erosion of cultivable land. As described in the irrigation section, the problem is due to deforestation, resulting in excessive floods and the excessive sloping of the stream beds. The banks of the Bajaur Khwar are not protected with gabion structures, structures which cannot be financed by the farming community. The FATA-DC has realized the problem and has constructed flood protection structures on the Khar/Seiko Khawar

t a cost of Rs. 2.56 million. The Lowi Baba and the Mutako Irrigation chemes funded by USAID, are constructed by the FATA-DC at a cost of Rs. .0 million. These schemes include the spurs on the banks for flood rotection measures. The Khazana Dhero irrigation scheme includes three purs for flood protection measures.

ajor inputs are required for flood control to save valuable cultivable ands from destruction by floods in Bajaur Agency along the Bajaur hawar.

E. Farm Water Management

he FATA-DC organization has built medium size irrigation nfrastructures for the development of agriculture. At present, the ater supply conveyance channels to the farms have not been built. lso, water distribution on a consumptive use basis has not been racticed. Water supply and water demand at the farm level need to be scheduled and managed for all completed irrigation sub-projects. With he completion of this activity, water will be efficiently managed and ill further increase agricultural production in terms of yield and cultivated area.

F. Community Participation

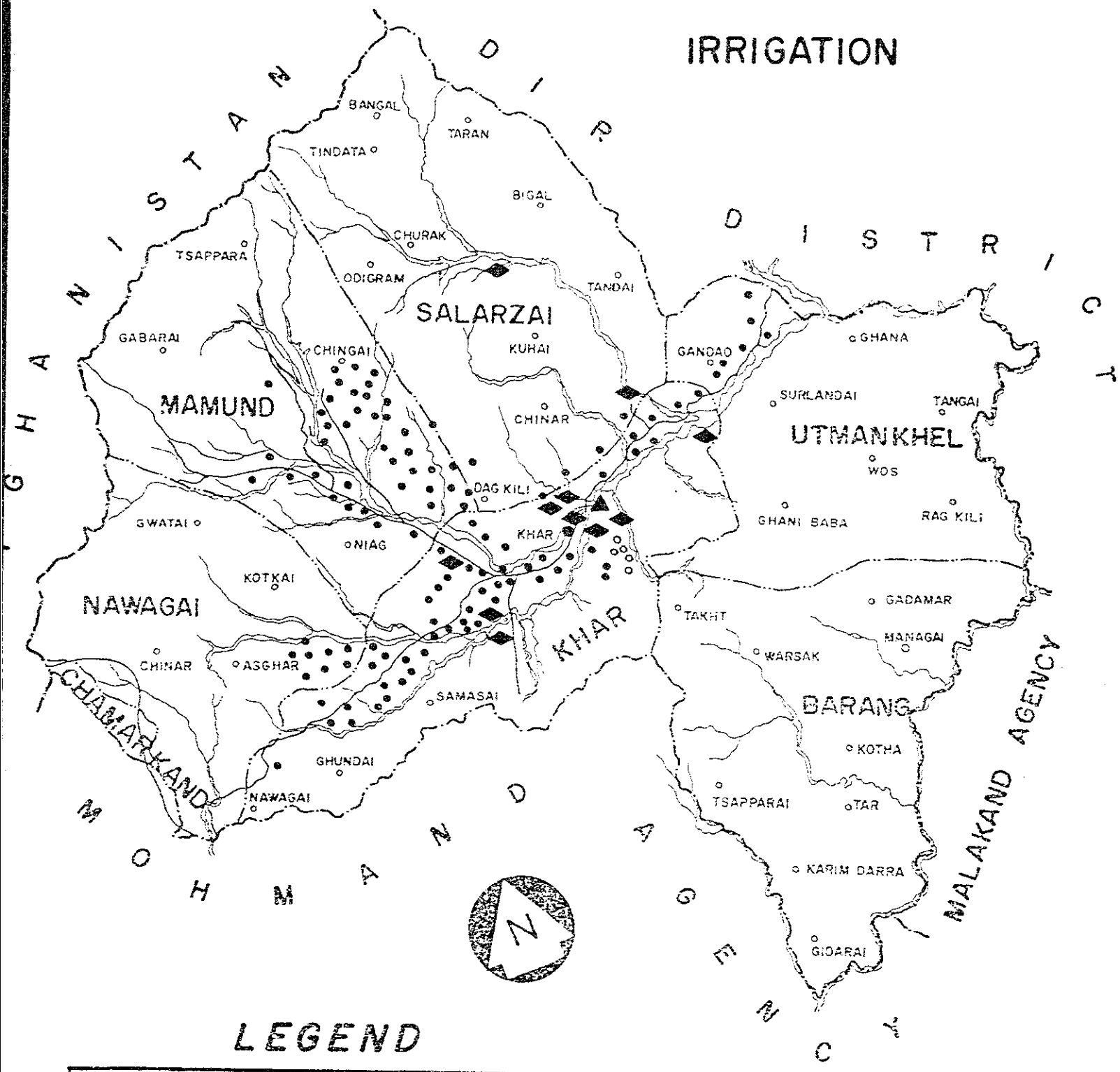
In order to economize the water supply to the beneficiaries, the cost of operation and maintenance should be borne by the farming community. FATA-DC has done this by shifting the operation and maintenance expenses of all the tubewells in the FATA to the beneficiaries.

There is reluctance on the community's part to accept the decision. The sustainability of these projects, however, depends on the successful community participation in the financial operation of the tubewells and the construction of lined water courses.

There is still a need to provide technical assistance from irrigation engineers, social scientists and agriculturists to transform the present non-rewarding cropping patterns into more income generating crops. Once this objective is achieved, the development of water for the beneficiaries will be economically accomplished, and more schemes can be constructed with savings from the operation and maintenance costs of the present schemes.

BAJAUR AGENCY

MAP # VII.I



LEGEND

- INTERNATIONAL BOUNDARY
- TRIBAL BOUNDARY
- TEHSIL BOUNDARY
- EXISTING PAVED ROAD
- RIVER / STREAM / KHWAR
- AGENCY HEADQUARTER
- VILLAGES / TOWNS

0 4 8 12 16 KM

le VII.6

FINANCIAL PROGRESS FOR ON-GOING SURFACE WATER SCHEMES FATA-DC
KHAR BAJAUR AGENCY

o.	Name of Scheme	PC-I Estimated Cost (Rs.in Million)	Area under control Acres	Discharge Cusec
	Surface water Schemes (ADP)			
.	Impt: to Girai Irrigation scheme in Bajaur Agency	2.360	430	8
.	Reconstruction & Rehabilitation of Chowathra Irri: scheme in Bajaur Agency	1.339	190	3
.	Flood Protection scheme on Khar/Seiko Khawar in Bajaur	2.560	-	-
.	Reconstruction & Rehabilitation of Mandow China Irrigation scheme in Bajaur Agency	1.500	150	3
.	Reconstruction & Rehabilitation of Derakai Irrigation scheme in Bajaur Agency	0.996	220	4
.	Reconstruction & Rehabilitation of Khararai Irrigation Scheme in Bajaur Agency	0.673	50	1
	Total	12.675	1040 acres	19 cusecs

le VII.7

FINANCIAL PROGRESS FOR ON-GOING GROUND WATER SCHEMES FATA-DC KHAR BAJAUR AGENCY

o.	Name of Scheme	PC-1 Estimated Cost (Rs. in Million)	Area under Control Acres	Discharge Cusec	Progress
	Groundwater Schemes (USAID)				
.	2 T/Wells Salarzai Plain Phase-II in Bajaur Agency	0.6	-	-	100%
	Surface Water Schemes,(USAID)				
.	Lowi Baba Irri.Scheme	2.57	190	2.0	100%
.	Mathako Irri. Scheme	3.398	300	3.0	90%
.	Khazana Dheri Irri.Scheme	2.01	250	3.0	10%
	Ground Water Schemes, (USAID)				
.	8 Nos. tubewell Bartras Phase-1	4.8	800	6.0	100%
.	S&I of 4 Nos tubewell in Bartras (P-II) in Bajaur Agency	3.100	500	2.5	50%
.	2 Tubewell schemes Salarzai in Bajaur Agency	0.600	225	1.7	-
	Ground Water Schemes, (I.N.M)				
.	S&I of 10 Nos tubewell in Bajaur Agency	6.700	1000	6.0	50%
	Total:	23.768	3075 acres	22.2 cusecs	

Table VII.8

FINANCIAL PROGRESS FOR ON-GOING SCHEMES
FATA-DC BAJAUR AGENCY
LIFT IRRIGATION SCHEME (N.A.S.)

S.No.	Name of Scheme	PC-I/ Estimated Cost (Rs.in Million)	Area under command Acres	Discharge Cusic
1.	Tooth Shah Lift Irrigation Scheme in Bajaur Agency	4.578	300	8
2.	Haji Lawang Lift Irrigation Scheme	3.250	500	10
3.	Ragh Dag Lift Irrigation Scheme	2.301	600	9
4.	Construction of Sultan Kach Lift Irrigation Scheme in Bajaur	3.247	440	3

VIII. ANIMAL HUSBANDRY

Live stock is the most important sideline rural activity in Bajaur both for home consumption and income generating purposes. Animals play a vital role in boosting family income, particularly when times are difficult and harvests are poor.

A live stock census was conducted in 1986. The results for Bajaur are presented below in Table VIII.1. The census introduction indicates that the the census findings are not totally accurate or dependable because of certain limitations of the Tribal Areas.

Table VIII.1

1986 Animal Census

Type of Animals	Numbers as of 1986
Cattle	110,153
Buffaloes	15,975
Sheep	75,515
Goats	62,488
Camels	7
Horses	85
Mules	1,009
Asses	11,599
Poultry	723,338

Based on these numbers, there are 85 cattle per square kilometer, 12 buffaloes per sq.km., 58 sheep per sq.km., 48 goats per sq.km., 9 asses and 560 poultry per square kilometer in the Agency.

Cattle and buffaloes are used mainly for milk for home consumption and sale in local bazaars. Sheep and goats are also an important source of milk and are mostly kept for sale and meat consumption. Horses, donkeys, mules and a few camels are used for transportation. Small farmers may own a donkey, but larger numbers are owned by more wealthy farmers whose main income is the transportation of building materials, firewood etc. As most land preparation is performed by tractors, the use of cattle for draft purposes are minor.

Poultry is an important component of the livestock sideline, providing meat and eggs for self consumption and sale. They are usually looked after by women, which is the only source of income for them in addition to being important supplementary farm income.

A typical small farmer will own a milking cow, young stock and several hens. The benefits of increased milk and egg production from these animals are just as important as increased crop yields.

As stated above, animals are mostly kept for milk and meat purposes, especially during religious festivals when farmers fetch good prices by selling their livestock in local cattle fairs. From sheep and goats, wool and mohair (goat hair used to make woollen cloth) are also sold in the market. Sufficient green fodder is available from July to October and in March and April. There is a shortage of green feed during the intensely cold winters. Crops commonly grown for livestock feeding include barley, berseem (Egyptian clover) during the Rabi season and maize, sorghum and capias during the Kharif season. During very hot and cold seasons, farmers feed their livestock wheat straw, rice straw and maize stalks with a little addition of concentrates, i.e., dry protein such as corn, oil cakes, wheat husk and barley.

The residents of Bajaur Agency have a keen interest in poultry breeding. The Government has established a poultry farm at Khar. Fertile eggs for the propagation of the Fayaumi breed and cockerel for cross breeding are provided to interested poultry breeders at government fixed prices. With the establishment of poultry farms, farmers tend to show interest in keeping exotic birds which lay four times the number of eggs than their local counterparts. Although no private poultry farm has been established in the Agency yet, few farmers have more than 50 of the exotic birds, especially of the Fayaumi breed. Because of the high rate of production, surplus eggs are disposed of in the market at a good price.

Twenty veterinary facilities and one poultry farm are located in the Agency. Only two veterinary officers are posted in the Agency.

A list of locations and staff is shown in Table VIII.2.

MAP # VIII.1

BAJAUR AGENCY

ANIMAL HUSBANDRY

LEGEND

- INTERNATIONAL BOUNDARY
- TRIBAL BOUNDARY
- TEHSIL BOUNDARY
- EXISTING PAVED ROAD
- RIVER / STREAM / KHWAR
- AGENCY HEADQUARTER
- VILLAGES / TOWNS

0 4 8 12 16 KM

Table VIII.2

Placement of Veterinary Facilities

Locations	Veterinary Officers	Veterinary Compounder	Stock Asst.	Insemi-nators
Civil Vet. Hospital Khar	1	2		1
Civil Vet. Dispensaries:				
Kharkano		1		
" " Hayatai		1		
" " Kulala		1		
" " Bandagai		1		
" " Matako		1	1	
" " Mandal		1	1	
" " Nawagai	1	1		1
" " Loesum		1		
" " Anayat Kili		1		
" " Karkhalazo		1		
" " Tarkhu		1		
" " Damdolo		1		
" " Kit Kot		1		
" " Kot Kai		1		
Civil Vet. Centers:				
Pashad			1	
" " Nazakai			1	
" " Shinkotai			1	
" " Manoder			1	
" " Cheenagai			1	

An account of the types of animal diseases found in the Agency are listed below.

Type of diseases

a) Contagious diseases:

The most prevalent diseases found in this circle are Black Quarter in cattle and Eterotoxeemia in sheep and goats.

b) Non-contagious diseases

i) Systemic diseases:
These diseases include digestive, respiratory and uro-genital disorders.

ii) Endo and Ecto parasitic Diseases:
The parasitic diseases include both external and internal parasites. External parasites include, ticks, magnemites and lice. Internal parasites include round worms, tape worms and liverflukes.

Vaccinations are an important part of the work of these facilities. According to the data provided by the department, the level of effort is low and shows a declining trend. The data on vaccinations is as follows:

Vaccinations	1988-89	1989-90	1990-91
Poultry	386,742	291,016	229,906
Animals	10,551	3,760	5,586

The above table shows a sharp decline in vaccinations both for poultry and animals. This may suggest less government budgeting or problems with the vaccine supply. Cold chain maintenance could also have been a problem.

The total number of animals treated at Agency facilities for three years is as follows.

Table VIII.3 Number of Animals Treated

Animals Treated	1988-89	1989-90	1990-91
-Out patients	37,762	34,148	36,131
-Number of animals castrated	1,273	1,011	1,094
-Animals treated against liver fluke	8,819	12,693	9,472
-Animals treated against B.Q.	5,590	3,371	3,856
-Animals treated against HSV	1,279	1,189	-
-Poultry vaccinated against new Doyle's disease	386,742	291,016	229,909
-Artificial insemination	2,591	2,899	2,420

Most livestock in the Agency are local brands, well adapted to the conditions and level of management, but of low productivity. The main breeds of the important livestock in Bajaur Agency are:

Cattle - Ackai and Gibrali, some jersey and Sahiwal blood now infused.
Goats - Kidding is the main breed and some betel have been introduced.
Sheep - All indigenous breeds, fat tails being the most common.

Poultry - Desi, a small breed with brown speckled feathers. Some Fayaumi chickens have also been introduced.

Artificial Insemination (AI)

Artificial insemination has recently been introduced in the Agency. Frozen semen of exotic breeds is being used for the genetic makeup of local cows which yield a smaller quantity of milk. Artificial insemination efforts are being made to produce crossbred cows which would give more milk as compared to local breeds. In addition, the crossbred cows produced reach puberty age at 18 months as compared to local cows whose offspring takes 3-4 years to reach maturity. The livestock owners take great interest in getting their animals artificially inseminated resulting in increased milk production and an increase in body weight. Farmers visiting veterinary hospital and dispensaries are advised by the staff to feed their animals with a balanced diet. Although no proper campaign in this regard has been launched by the department, the department intends to impart technical know-how regarding the inexpensive formulation of rations for livestock, and also to introduce improved varieties of fodder crops in the Agency. The Department is considering including such projects in the third work plan with the cooperation of the Narcotics Control Program.

Statistics obtained from the department for artificial insemination are given in Tabel VIII.4.

Table VIII.4

Artificial Insemination Statistics

Artificial Insemination	1988-89	1989-90	1990-91
No. of cows inseminated	2197	2497	2122
Cow calves born	242	694	213
No. of buffaloes inseminated	394	402	298
Buffalo calves born	50	113	23

The above table shows an increase in AI statistics up to June 1991. The conception rate in cows is far better than in buffaloes. According to the Department, they get a 35 to 50 percent positive rate in cows and about 25 to 30 percent in buffaloes. The success rate could be improved and could go as high as 50 to 60 percent if proper techniques, regular examinations, proper timings and proper heat detection steps are followed.

Researchers visited the Veterinary Headquarters Hospital in Khar, the Veterinary Dispensary in Nawagai, and the poultry farm in Khar. The findings are as follows:

A. Veterinary Headquarters Hospital (Khar)

This hospital was established in 1963 as a veterinary dispensary. It was upgraded in 1970-71 to a veterinary hospital. Currently the staff includes one veterinary officer, one veterinary compounder, one stock assistant, one inseminator and four class IV servants. At the time of the visit, medical supplies were available and the condition of the building was satisfactory.

Electricity and potable water were available and all the staff were provided with residential quarters. Transportation was not available. The hospital was equipped with all necessary equipment such as:

a) Cattle crust
b) Mouth Gauge
c) Tooth Raspers
d) Dystokia set
e) Artificial Insemination equipment
f) Liquid nitrogen containers

The officer on duty said that the supply of semen and liquid nitrogen had been stopped since mid June 1991, and therefore, artificial inseminations could not be carried out.

The veterinary officer maintains a proper record of animals treated on a daily basis. The total number of animals treated from July 1990 to June 1991 at the facility are listed below in Table VIII.5.

Table VIII.5

Month	Number of Animals treated	Castrated
July, 1990	305	3
August	239	1
September	315	1
October	243	1
November	213	1
December	164	-
January, 1991	253	2
February	195	14
March	219	6
April	291	6
May	268	10
June	200	3

Animals inseminated from July 1990 to June 1991 are listed below in Table VIII.6.

Table VIII.6

Animals Inseminated 1990-91

Month	Cows	Buffaloes
July, 1990	268	15
August	172	15
September	201	32
October	141	25
November	131	35
December	99	36
January, 1991	114	40
February	110	24
March	230	26
April	197	15
May	289	17
June	15	18

July]
August] Non-availability of semen and liquid nitrogen.
September]

B. Veterinary Dispensary and AI Center, Nawagai

This dispensary was established in 1975-76. At present, the staff includes one veterinary officer, one veterinary compounder, and one inseminator. The veterinary doctor's post for AI is vacant. There was an adequate supply of medicines available and the facility is provided with potable water and electricity. The condition of the building was satisfactory. Residential quarters have been provided to all the staff. The officer has been provided with a motor cycle, and basic equipment was available such as:

a) Cattle crust
b) Mouth gauge
c) Tooth raspers
d) Artificial Insemination equipment
e) Liquid nitrogen containers

The peak animal visitation hours at the facility were from 7.00 a.m. to 10.00 a.m. The number of patients treated per day depends on the season and the time of year. The officer maintains a proper record of the numbers of animals treated as given below in Table VIII.7 from July 1990 to June 1991.

A. Veterinary Headquarters Hospital (Khar)

This hospital was established in 1963 as a veterinary dispensary. It was upgraded in 1970-71 to a veterinary hospital. Currently the staff includes one veterinary officer, one veterinary compounder, one stock assistant, one inseminator and four class IV servants. At the time of the visit, medical supplies were available and the condition of the building was satisfactory.

Electricity and potable water were available and all the staff were provided with residential quarters. Transportation was not available. The hospital was equipped with all necessary equipment such as:

a) Cattle crust
b) Mouth Gauge
c) Tooth Raspers
d) Dystokia set
e) Artificial Insemination equipment
f) Liquid nitrogen containers

The officer on duty said that the supply of semen and liquid nitrogen had been stopped since mid June 1991, and therefore, artificial inseminations could not be carried out.

The veterinary officer maintains a proper record of animals treated on a daily basis. The total number of animals treated from July 1990 to June 1991 at the facility are listed below in Table VIII.5.

Table VIII.5

Month	Number of Animals treated	Castrated
July, 1990	305	3
August	239	1
September	315	1
October	243	1
November	213	1
December	164	-
January, 1991	253	2
February	195	14
March	219	6
April	291	6
May	268	10
June	200	3

Animals inseminated from July 1990 to June 1991 are listed below in Table VIII.6.

Table VIII.6

Animals Inseminated 1990-91

Month	Cows	Buffaloes
July, 1990	268	15
August	172	15
September	201	32
October	141	25
November	131	35
December	99	36
January, 1991	114	40
February	110	24
March	230	26
April	197	15
May	289	17
June	15	18

July]
August] Non-availability of semen and liquid nitrogen.
September]

B. Veterinary Dispensary and AI Center, Nawagai

This dispensary was established in 1975-76. At present, the staff includes one veterinary officer, one veterinary compounder, and one inseminator. The veterinary doctor's post for AI is vacant. There was an adequate supply of medicines available and the facility is provided with potable water and electricity. The condition of the building was satisfactory. Residential quarters have been provided to all the staff. The officer has been provided with a motor cycle, and basic equipment was available such as:

a) Cattle crust
b) Mouth gauge
c) Tooth raspers
d) Artificial Insemination equipment
e) Liquid nitrogen containers

The peak animal visitation hours at the facility were from 7.00 a.m. to 10.00 a.m. The number of patients treated per day depends on the season and the time of year. The officer maintains a proper record of the numbers of animals treated as given below in Table VIII.7 from July 1990 to June 1991.

Table VIII.7 Number of Animals Vaccinated

Month	Animals Treated	Castrated	Liverfluke	Vaccination NDV *	Vaccination BQV *
July, 1990	219	8	66	1765	-
August	182	10	71	1769	231
September	210	8	71	985	115
October	170	3	41	1907	470
November	198	3	57	986	-
December	217	1	63	1563	-
January, 91	208	1	53	2277	-
February	207	2	54	290	-
March	207	4	59	974	-
April	212	21	56	1459	-
May	219	23	66	978	-
June	203	2	52	978	-

* NDV = New Doyles Vaccine, for the prevention of Newcastle's disease in poultry.
* BQV = Black Quarter Vaccine for cattle.

The animals inseminated from July 1990 to June 1991 at Nawagai dispensary are listed below in Table VIII.8.

Table VIII.8 Number of Animals Inseminated

Month	Cows	Buffaloes
July, 1990	96	6
August	81	8
September	82	8
October	61	15
November	85	16
December	87	13
January, 91	70	11
February	62	8
March	61	8
April	98	8
May	93	9
June	92	7

July]
August] Non-availability of semen and liquid nitrogen.
September]

One poultry farm has been established at Khar. It is the only poultry farm in the agency and has a capacity of 2000 birds. Eggs are sold to locals both for consumption and hatching purposes. Birds of the Fayaumi breed which has a good resistance against diseases, and has been well-adapted to the local conditions, are being reared. It is a small breed with good egg laying quality. Locals take a keen interest in keeping these birds at their houses. They lay four times more eggs than local breeds. Cockerels are also supplied at government fixed prices to interested breeders for crossbreeding with local birds in order to produce crossbreeds with a larger egg laying capacity.

The performance of the farm for 1990-91 is as follows:

Table VIII.9 Statistics on Poultry Farm, Khar

No. of Eggs produced	115,986
No. of Eggs sold	112,805
No. of Birds sold	2,011

C. Afghan Refugee-Owned Animals

Data pertaining to refugee-owned animals was obtained from the office of the Agency Administrator for Afghan refugees, Bajaur in Khar. The information is presented below:

Table VIII.10 Statistics on Refugee-Owned Animals

Type of Animals	Number as of 1991
Cows	5040
Buffaloes	228
Goats	11645
Sheep	2757
Donkeys	219

No other information on refugee-owned animals was available from any other source.

One full-fledged mobile veterinarian was extending veterinary aid to ailing animals of Afghan refugees in Bajaur Agency, but this service was terminated. At present, Afghan refugee-owned animals are getting veterinary aid from the government veterinary facilities.

The Afghan refugee-owned animals are said to have brought various diseases to the Agency. The most common of them all is worm infestation.

IX. FORESTRY

A. Forest Resources

The Agency has seven substantially forested areas. The total area under forests as of 1990 covered 2980 acres. These forests are privately owned by different tribes whose members can cut the trees as they wish. The main forested areas are:

1. Batwar area in Salarzai
2. Loegram area in Salarzai
3. Kaga and Gabari Sar in Momand area
4. Hashim area in Charmang
5. Kamangarah area
6. Kho-i-Moor hills in Utman Khel area
7. Arang area

The following species are indigenous to the Agency:

1. Olive
2. Gorgora
3. Pulahi
4. Sanatha
5. Bung
6. Chir
7. Bair (ziziphus)

The areas most affected by deforestation are:

1. Gabari
2. Kamangara
3. Charmang
4. Shingus

Unlike Orakzai Agency, none of the communities prohibit the cutting of immature trees nor does the Department have any tree protection policy.

At present, no logging operations are conducted by the Forest Department. In addition, the Department has no data pertaining to private and commercial logging operations underway, if any. The Forest officer was unable to give any information in this regard.

Forestry Department Activities:

The Forestry Department staff in the Agency consist of one forester at each nursery. Each forester is responsible for at least five to seven block plantations and forestry guards for each nursery and block plantation. The Forestry office responsible for Bajaur is located in Khar. There are no nurseries or block plantations

maintained by the forestry staff of Bajaur Range outside the Agency. There are no riverside plantations owned by the Department. Table IX.1 shows the locations of the nurseries:

Table IX.1 Location of the Nurseries

Location	Species	No. of Species	Remarks
Hayati Dag Nursery	Eucalyptus	51000	1.25 acres
	Sanatha	3000	
	Chir	4000	
Hayati Dag Nursery	Ailanthus	15000	1.50 acres
	Robinia	40000	
Jar Nursery	Eucalyptus	340000	2 acres
	Pulahi	14000	
	Chir	14000	
	Sanatha	20000	
	Shisham	9000	
	Robinia	35000	
	Ailanthus	25000	
	Poplar	8000	
	Toot	2500	
Haji Lawang Nursery	Eucalyptus	345000	2 acres
	Sanatha	600	
	Bottle Brush	2500	
	Kachnar	1000	
	Persian Pine	2500	
	Pulahi	3000	
	Robinia	40000	
	Ailanthus	14000	
	Poplar	9000	

The trees sold from 1980 to 1990 totaled 89,731, at a total cost of Rs.21,672. All of the nurseries are situated at Khar Munda road and are easily accessible to farmers. The nurseries sell trees to the farmers of Bajaur Agency.

The Department has also established block plantations on privately owned land. Table IX.2 (a) shows released block plantations and Table IX.2 (b) shows block plantations which are maintained by the Department as of September, 1991.

Table IX.2 (a) Block Plantations Released by the Department

Nos	Locations	Acres	Remarks
1.	Salarzo 2	236	Released to the owner
2.	Salarzo 3	50	"
3.	Salarzo 4	70	"
4.	Amir Zada	46	"

Nos	Locations	Acres	Remarks
5.	Qayum	66	Released to the owner
6.	Jar No. 1	37	"
7.	Jamna Dehri No.3	113	"
8.	Shah Zada area	23	"
9.	Salarzo No.1	383	"
10.	Damdola	107	"
11.	Sani Ghar	225	"
12.	Baba Dehri	1166	"
13.	Charmang	129	"
14.	Khazana Dehri No.1	70	"
15.	Qazafi No.2	62	"
	Total:	2783	

Table IX.2 (b) Block Plantations Maintained by the Department

Nos	Locations	Acres	Remarks
1.	Banda	50	Maintained by the Department
2.	Haji Abad	6	"
3.	Bahi China No.1	80	"
4.	Bahi China No.3,4	127	"
5.	Ali Rahman	50	"
6.	Bahadur	35	"
7.	Badali	440	"
8.	Zahir Shah	182	"
9.	Damangai	39	"
10.	Jangazi	46	"
11.	Malook	100	"
12.	Bahi China No.2	126	"
13.	Landai	80	"
14.	Baji Gram	37	"

Nos	Locations	Acres	Remarks
15.	Behram Pur	151	Maintained by Department
16.	Kharkano	40	"
17.	Batai No.1	150	"
18.	Batai No.2	75	"
19.	Jar No.2	42	"
20.	Jar No.3	35	"
21.	Jar No.4	50	"
22.	Salarzo No.5	30	"
23.	Shahgai	36	"
24.	Hayati No.1	37	"
25.	Kulala Tangi No.1	123	"
26.	Hayati No.2	75	"
27.	Showkat	50	"
28.	Karez	135	"
29.	Baro	80	
30.	Kausar	41	"
31.	Inzari No.1	40	"
32.	Zooz Bandar No.1	100	"
33.	Zoor Bandar No.2	100	"
34.	Zoor Bandar No.3	160	"
35.	Nawaz	45	"
36.	Charmang No.2	143	"
37.	Inzari No.2	103	"
38.	Khazana Dehri No.2	55	"
39.	Matako	100	"
40.	Shahi Shah	64	"
41.	Kulala No.2	70	"
42.	Kulala No.3	95	"
43.	Rahmat ullah	25	"
44.	Jar No.5	35	"
45.	Malkana No.1	110	"
46.	Malkana No.2	60	"
47.	Rasha Dehri No.1	100	"
	Total:	3953	

About 435 trees are provided per acre for each plantation. The Forestry Department usually maintains the plantation for four to five years before releasing it to the owners.

Researchers visited two block plantations, Jar I and Kausar I which have been relinquished to the owners:

Jar I

This plantation was established in December 1987. It consists of 37 acres planted with Eucalyptus. The plantation is well maintained. As of this writing, about 96% to 98 % of the species still exist and have an average height of 10 to 11 feet. It was released to the owner in September 1991. There was no record available of the Department's investment while it was maintained by them.

Kausar I

This plantation was established in 1983-84. It consists of 45 acres planted with Eucalyptus. The plantation is well maintained. As of this writing about 96% to 99% of the species still exist and have an average height of 12 to 13 feet. It was released to the owner in 1987. There was no record available pertaining to the Department's investment while it was maintained by them.

Researchers visited two other block plantations, Haji Abad and Bahi China 1 which are being maintained by the department.

Haji Abad

This plantation was established in 1990-91. It consists of 6 acres planted with 2610 sheesham trees. The plantation is well maintained. As of this writing, about 99% of the trees still exist and have an average height of 3.5 to 4 feet. It will be released to the owner in 1993-94 who will probably sell the trees for timber.

Bahi China 1

This plantation was established in 1990-91. It consists of 80 acres planted with 8700 Robinia and 26100 Eucalyptus plants. As of this writing, 97% of the species still exists. It will be released to the owner in 1993-94.

Sericulture

The Sericulture Department is trying to promote the raising of silk cocoons as a cottage industry to supplement farm income. It manages one mulberry nursery in the Agency. The nursery was established in 1983 in Khar. Eleven kanals of government land is devoted to the nursery which contains 40,000 "Morns alba Japanese", or Japanese mulberry. The trees are distributed to interested farmers.

The staffing pattern at Khar is as follows:

Table IX.3

Staffing Statistics

Name of Post	Numbers
Sericulture Development Officer	1
Sericulture Inspector	1
Sericulture Dealer	1
Sericulture Supervisors	4

Physical as well as financial targets or achievements of the nursery from the year of establishment are given in Table IX.4.

BAJAUR AGENCY

LEGEND

- INTERNATIONAL BOUNDARY
- TRIBAL BOUNDARY
- TEHSIL BOUNDARY
- EXISTING PAVED ROAD
- RIVER / STREAM / KHWAR
- AGENCY HEADQUARTER
- VILLAGES / TOWNS
- BLOCK PLANTATION
- FOREST NURSERIES

0 4 8 12 16 KM

ble IX.4 STATUS OF SERICULTURE IN BAJAUR AGENCY

Item of Work	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	Total
Physical Work								
1. Distribution of Mulberry plants (Nos.)	5000	8000	20000	5000	12000	24250	25000	99250
2. Distribution of silk seed (pkts.)	40	79	100	75	181	47	206	728
3. Purchase of dry cocoons (kgs.)	148	220	204	100	300	180	570	1722
4. Production of silk yarn departmentaly (kgs.)	-	61	44	31.650	30	30	37	233.650
5. No. of families to be trained at their home (Nos.)	40	79	100	75	181	47	206	728
6. Construction of buildings	-	2	1-1/2	1/2	-	-	-	4
Financial Utilization	30373	638146	602241	407648	316592	200000	364000	2559000
7. Income in Public/private sector	108000	200000	260000	210000	516000	170000	692160	2156160
8. Saving of foreign exchange	279000	552000	700000	560000	1350000	394200	1729000	556420

The Sericulture Department has involved 300 families in cocoon production and has trained 500 people in 1990-91. The number of families fluctuates every year due to the availability of funds for silk worm seeds.

In 1990-91, 300 seed packets were distributed to farmers. The Department also distributed 40,000 plants at the rate of 10 paisas each. Out of approximately 3000 kg. of dry cocoons, the Department bought about 250 kg. at the rate of Rs.200 per kilogram. The rest were sold to private dealers in the Agency who export it to Punjab. Each family with one seed packet could in theory earn around Rs.2200 for 5 weeks of work.

COMMUNICATIONS

A. Roads

There are two ways of entering Bajaur Agency from Peshawar. One way is via the main Malakand-Swat Road, where at a distance of 132 km from Peshawar at Chakdara chowk, a side road turns to the left. It passes through Dir District. At Timargara, the headquarters of Dir, one road leads straight north towards the well-known Lawari Top Pass, the other road on the left leads south toward Khazana village and then to Munda, the last peripheral village and bazaar of Dir District. Crossing over the famous Jandul River bridge and Torgundai check post, one finds oneself in Bajaur Agency.

One can also enter Bajaur Agency via Mohmand Agency from Nawagai. The Warsak road from Peshawar passes through Mohmand Agency and enters Bajaur at Nawagai. The Mohmand Agency route is relatively unsafe and often remains closed for different administrative and political reasons. The blockade of roads is one of the traditional devices used to bargain by both various tribesmen and the political administration.

Bajaur Agency, thus, is connected at two different points on the east at Munda, and on the west at Nawagai by one single-lane paved road, the Munda-Khar-Nawagai Road. It is the main road and passes through the major tehsils of the Agency. This road is of great commercial as well as political importance.

It takes about one complete hour to drive from Munda to Khar, the headquarters of Bajaur Agency, on a road 20 ft. wide and 21 km long. It takes almost another hour to travel the distance of 26 km, from Khar and to cross Nawagai into Mohmand Agency.

The Munda-Khar-Nawagai road is the longest stretch of 47.29 km in length. This road comprises 37.3 % of the total 126.8 k.m. of blacktopped roads in the Agency. It also divides Bajaur Agency into two different eastern and western halves crossing through almost all the tribes' territories. The western half, including Mamund and Salarzai areas, is well connected with branches and sub-branches of blacktopped roads. However, the southwestern part of Charmang and Chamarkand areas are poorly connected with shingled roads and are highly inaccessible. Table No. X.1 shows a detailed network of roads in Bajaur Agency.

Table X.1

Total Length and Percentage of Roads in Different Areas and Tehsils of Bajaur Agency

A. Blacktopped Roads

Tehsils		Length	Percentage
Main Munda-Khar-Nawagai Road		47.29 km	37.3%
Mamand Tehsil			
i. Inayat Kalay to Ghakhi road	20.9		
ii. Barkhalozo to Mina road	11.4		
iii. Umari Killi to Kharkai	12.0	44.3 km	34.9%
Salarzai Tehsil			
i. Raghagn to Pashat road	12.8		
ii. Haji Lawang to Pashat	13.5	26.3 km	20.6%
Others: which include Barang, Utman Khel & Charmang		9.0 km	7.2%
Total Length		126.81 km	

B. Shingled Roads

Barang Tehsil	
i. Khar to Selai Patai	22.1 km
ii. Khar to Zolam road	27.0 km
Salarzai Tehsil	
iii. Chargo to Darra Baba	9.4 km
Charmang and Others	
iv. Loesum to Sartai	4.8 km
v. Qulangi-Sharbatai road	5.6 km
Total Shingled Roads in the Agency =	66.9 km

Roads in Mamund Tehsil

Mamund Tehsil is one of the most densely and overpopulated tehsils in Bajaur Agency. It has the major share of 44.3 km length of the total road network in the Agency. Its description is as follows:

1. Inayat Kalay to Ghakhi Pass Road

Three kilometers from Khar Colony on the Khar-Nawagai road, the road takes a turn to the right at Inayat Chowk. It leads through major villages and bazaars at different points. It is the second longest road in Mamand Tehsil, of 20.9 k.m. length, and 12 ft. width. This road is significant in connecting neighboring Kunar Province of Afghanistan, through the well known Ghakhi Pass. This road is used as a transit pass by Afghan refugees in transporting agricultural produce, timbers, consumer, and other goods from Afghanistan to Bajaur Agency. The road is paved to Ghakhi village, although a small section of the road is shingled. Work is in progress to turn it into a completely paved road. A description of this road is given in Table X.2.

Table X.2

Description of Inayat Kalay-Ghakhi Road

Places	Time	Length in Kilometers	Remarks
Khar Colony Gate	0.00	00.0	starting point
Inayat Kalay Chowk	0.05	03.0	a branch road turns to the right.
Inayat Kalay Bazaar	0.10	06.2	3500 to 4000 population with 40% refugees, more than 300 shops
Mamund Tehsil Area	0.12	07.7	Tehsil area starts
Umari Bazaar	0.13	08.0	40 shops
Wara Mamand	0.14	08.8	a sub branch road leads to Tani Kharkai from here
Qamar Sar Bazaar	0.17	11.1	40 shops
Barkhalozo Chowk	0.19	13.1	a sub branch of 11 k.m. paved road leads to Intro village
Tarkho Village	0.21	16.8	30 shops
Chamyar Jokhar	0.25	18.9	local timber market
Laghari Bazaar	0.26	19.5	on the left the road turns to Ghakhi Pass, a straight road of 4 k.m. length goes to Kit-Kot village of 6000 population (approx.)
Ghakhi Village	0.32	23.3	the paved road ends and a shingled road leads to Ghakhi pass

Source: Field Survey. On an average speed of 35 to 40 km per hour

2. Barkhalozo to Mina Road

It is a sub branch of the Inayat Killi Ghakhi road. It is 11.4 k.m. long, and connects the following villages shown in Table X.3.

Table X.3

Description of the Barkhalozo Mina Road

Places	Time	Lemgth in Kilometers	Remarks
Barkhalozo Chowk	0.00	00.0	starting point
Barkhalozo Village	0.02	01.0	Approximatly 2000 population
Malangi Village	0.10	06.6	-
Mina Bazaar	0.11	08.7	50 shops
Intro Bazaar	0.16	11.0	50 shops
Khwar	0.17	11.4	paved road ends

3. Umarai Village to Kharkai Road

It is also a sub branch of the main Inayat Killi-Ghakhi road passing through the perennial Tani river over a bridge. The details are as follows in Table X.4.

Table X.4

Description of Umarai Killi to Kharkai Road

Places	Time	Length in Kilometers	Remarks
Umarai Chowk	0.00	00.0	starting point
Balot river	0.06	02.8	the river is dry with no bridge
Shago Village	0.14	07.7	
Kharai Qamar	0.19	10.7	400 houses
Kharakai	0.22	12.0	paved road ends

2. Pashat Haji Lawang Road

This road connects the remaining part of Salarzai Tehsil. From Pashat, another road leads to Haji Lawang Chowk at the main Munda-Khar road. Starting from Pashat village, the beginning of the road is in rough condition. After passing through Balam Khar village via Ghakhi Ghar, work is in progress to turn a portion of 5 to 6 km of the shingled road into a metaled one. From Tali village to Haji Lawang chowk, the road is smooth and paved. Table X.6 shows the details of this road starting from Pashat village.

Table X.6

Pashat Haji Lawang Chowk Road

From	Time	Length in Kilometers	Remarks
Pashat Village	00	00	Work in progress on the shingled road
Balam Khar Village	0.5	1.4	Ghakhi Ghar with minimum or no traffic
Ghakhi Village	0.12	5.0	end of the Ghakhi Ghar
Talai Village	0.15	7.3	paved road starts, 600 to 700 houses in the village
Chargo	0.25	11.0	a shingled road turns to the right with 8 km length to Darra Baba
Haji Lawang Chowk	0.29	13.5	intersects the main Munda-Khar road

3. The Remaining Roads in the Agency

The eastern half of Bajaur Agency comprising Utman Khel and Barang Tehsil, has a negligible share of the paved road network and is highly inaccessible. Two major roads are under construction in the area. One is from Khar to Selei Patai at 41 km long, which is expected to be completed in 1994 with an estimated cost of rupees 120 million. This will reduce the total distance by half from Bajaur to Peshawar. Another major road of 27 km length from Khar to Zolam is also under construction. These roads will certainly facilitate the connection of major Utman Khel tribesmen with various commercial and trade centers of Pakistan.

A small part of the southern area of the Agency, like Chamarkand, is not properly connected with the rest of the Agency. A shingled road is under construction in the area, however, which will make the provision of community services like medical care, schooling and the delivery of mail easier, and will add opportunities for travel and give ready access to the Agency Administration.

The inventory of bridges in Bajaur Agency is given in Table X.7.

B. Air

Bajaur Agency has no direct air link with the rest of the country. There is no airstrip facility available at the present time. Negotiations are in progress by the Political Administration to purchase land in Khar for this purpose.

C. Telephone, Telegraph and Post Offices

There is one Public Telephone Exchange in Khar colony having a capacity of 500 lines. There is also another Nawagai Scout Exchange with 20 lines, which only fulfills the personnel requirements of the militia. The public Telephone Exchange was established in June 1989. Currently, it has 450 subscribers with an additional 50 lines available for new users. There are three Public Call Offices (PCOs) in Khar Bazaar, two in Khar Colony, one at Inayat Killi bazaar and one at Patak Chowk.

The only Telegraph Office in the Agency at Khar has insignificant numbers of business transactions. This Post Office at Khar Bazaar is situated in a rented house. One clerk and two post men are assigned to this post office. A parttime shop keeper, who is self employed acts as a postman at Nawagai, Inayat Killi, Raghagan, Tarkho Killi Bazaar, Loesum and Ghakhi Killi. These postmen usually do not deliver mail to the various households directly, but hold mail for people to collect from these points.

These facts indicate the deficiency of the communication channels in the Agency, even though there are thousands of Bajaurites scattered all over Pakistan and abroad. They are certainly in need of communicating with their families and others in the Agency.

Table X.7

STATEMENT SHOWING THE INVENTORY OF BRIDGES IN BAJAUR AGENCY

Name of Road	Name of Bridge	Year of Const.	Stream	Width of Road
Munda Khar Nawagai	Munda Bridge in Mile 1.	1979-80	Munda Khwar	24 ft.
	Jar Bridge in Mile 6.	1979-80	Jar Khwar	24 ft.
	Khar Bridge in Mile 10	1979-80	Khar Khwar	24 ft.
	Kirala Bridge in Mile 16.	1977-78	Naroubo Mula	24 ft.
	Loesum Bridge in Mile 22.	1977-78	Loesum Nullah	24 ft.
	Bagori Bridge in Mile 24.	1977-78	Bagori Nullah	24 ft.
	Sheikh Killi Bridge in Mile 19.	1984-85	Sheikh Killi Khwar	24 ft.
	Haji Lawang Bridge in Mile 8.	1985-86	Haji Lawang Nullah	24 ft.
Inayat Kalay Ghakhi	Bridge in Mile 6.	1978-79		24 ft.
	Bridge in Mile 8.	1990-91	Yarkhu Khwar	24 ft.
Road improvement and Black Toping of Wara Mohmand road in Salarzai Area	Bridge in Mile 2.	1978-79	Kamar Khwar	24 ft.
	Bridge in Mile 3.	1978-79	Jangzai Khwar	24 ft.
	Bridge in Mile 4.	1982-83	Kamil Khwar	24 ft.
	Bridge in Mile 5.	1982-83	Maina Khwar	24 ft.
Selai Patai	Bridge in Mile 1.	1987-88	Kot Khwar	24ft.

Source: Road Statistics by Communications and Works Division Khar, Bajaur Agency up to June 30th 1991.

XI. EDUCATION

A. Primary Level

Most primary schools offer classes I-IV. A few offer class V, but class V enrollment has been counted as a part of the middle school enrollment since the majority of class IV students would have to transfer to a middle school if they wanted to attend class V.

1. Girls' Primary Education

The first girl's primary school in the Agency opened in 1974-75 in Khar. The number of girls' primary schools and sections in each tehsil up to November 1990 is as follows:

Table XI.1 Number of Girls' Primary Schools by Tehsil

S.No	Sub-Division	Tehsil	Number of Schools & Sections
1.	Khar	Khar	14
2.	"	Utman Khel	7
3.	"	Salarzai	4
4.	Nawagai	Nawagai	5
5.	"	Barang	-
6.	"	Chamarkand	-
7.	"	Mamund	7
		Total:	37

The concentration of girls' primary schools is mainly in Khar sub-division where 68 percent of the schools are located. The remaining 32 percent of the schools are located in Nawagai sub-division. The percentage of population and schools by tehsil are given in Table XI.2.

Table XI.2 Population Versus Girls' Primary Schools

Tehsil	Percentage of Agency population %	Percentage of Agency girls' primary schools %
Khar	13	39
Utman Khel	10	19
Salarzai	21	11
Nawagai	12	14
Momund	29	19
Barang	15	0
Chamaskand	N/A	0

Table XI.3 shows girls' primary level enrollment from 1980-81 to 1990-91. This data also includes the enrollment of the primary sections of the middle and high schools.

Table XI.3

Girls' Primary Level Enrollment

Class	I jr	I sr	II	III	IV	Total
1980-81	-	190	46	28	19	283
1981-82	80	99	48	34	21	282
1982-83	90	193	47	36	18	384
1983-84	182	106	77	42	14	421
1984-85	309	187	86	44	21	647
1985-86	521	395	279	124	62	1381
1986-87	388	354	261	172	100	1275
1987-88	313	280	156	96	68	913
1988-89	405	335	144	120	70	1074
1989-90	462	234	155	86	74	1011
1990-91	482	330	182	125	77	1196

These statistics give a clear indication of a gradual drop-out rate from class to class. Another phenomenon may be the transfer of students to other places. From 1980-81 to 1990-91,the total primary enrollment has increased almost four times.

Using the 1981 census data for the number of males age 5 to 9 and assuming there would be approximately the same number of females, we can derive a female participation rate of roughly 4 percent by taking the 3.1 percent annual population growth rate.

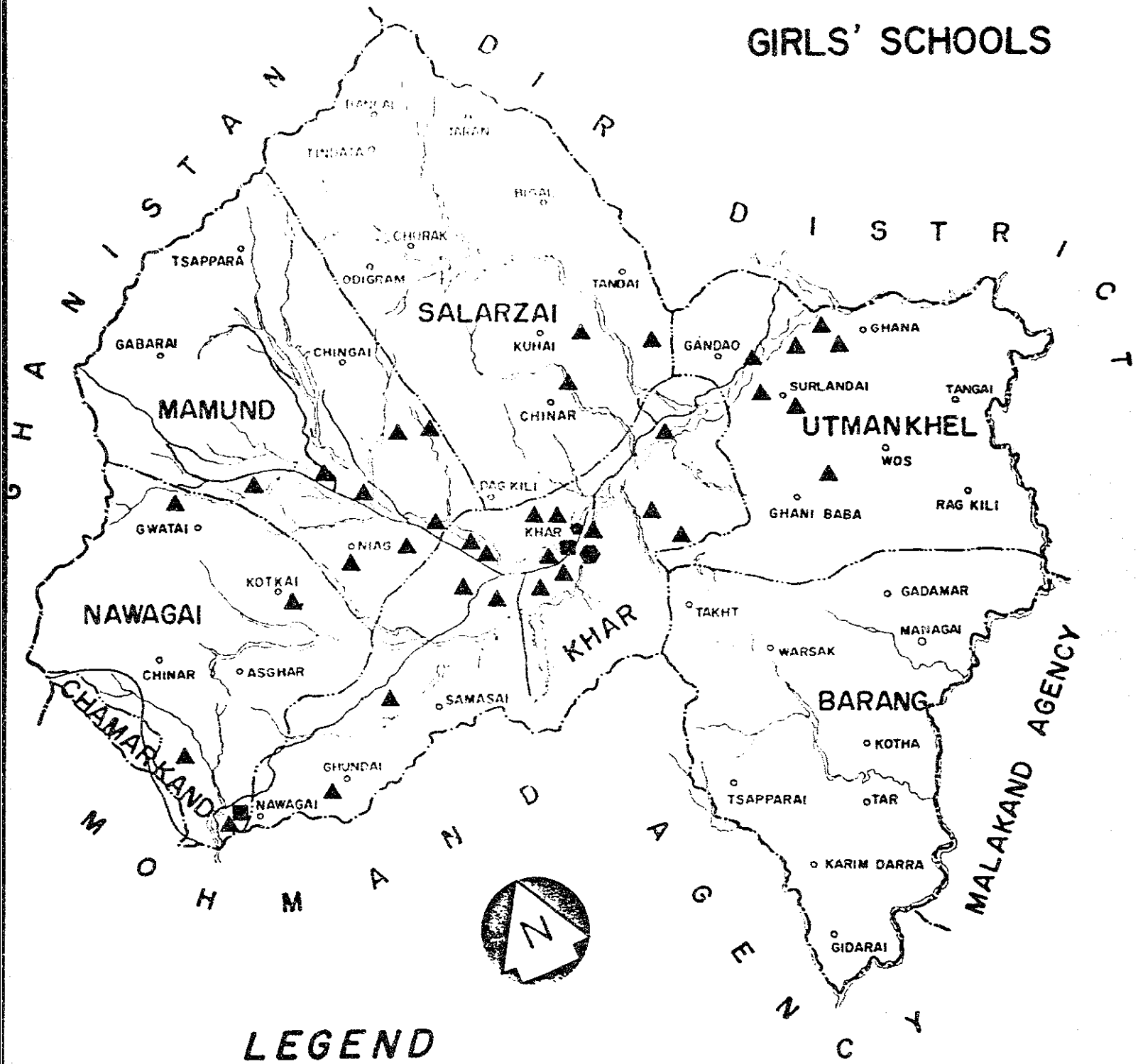
The recruitment of female teachers is a serious problem in the Agency. They are mainly recruited from outside the Agency. According to the Agency Education officer, there are 115 sanctioned teacher positions in 1991-92. Out of these 115 positions, 7 are vacant and all 108 positions are filled by non-local female teachers. Some of these teachers are trained as part of the Agency's quota but later on, they obtain a transfer to the settled areas. This problem will persist until numerous Agency-domiciled teachers are available.

According to the Agency Education Officer, in almost all primary schools, children under five years of age attend but are not admitted. On the average, 20 children under five years of age attend each primary school.

MAP # XI.1

BAJAUR AGENCY

GIRLS' SCHOOLS



LEGEND

- INTERNATIONAL BOUNDARY
- TRIBAL BOUNDARY
- TEHSIL BOUNDARY
- EXISTING PAVED ROAD
- RIVER / STREAM / KHWAR
- AGENCY HEADQUARTER
- VILLAGES / TOWNS
- PRIMARY SCHOOLS

2. Boys' Primary Education

There were eight primary schools for boys in operation when Bajaur Agency was established as an Agency on December 1, 1973. The number of boys' primary schools and sections in each tehsil up to November 1990 is as follows:

Table XI.4 Number of Boys' Primary Schools by Tehsil

S.No	Sub-division	Tehsil	No. of schools and sections
1.	Khar	Khar	43
2.	"	Utman Khel	23
3.	"	Salarzai	58
4.	Nawagai	Nawagai	19
5.	"	Mamund	43
6.	"	Barang	10
7.	"	Chamarkand	3
		Total:	199

The main concentration of boys' primary schools is in Khar sub-division where 62 percent of the schools are located. The remaining 38 percent of the schools are located in Nawagai sub-division. The population and schools/sections by tehsil are given in Table XI.5.

Table XI.5 Population Versus Boys' Primary Schools

Tehsil	Percentage of Agency Population %	Percentage of Agency boys' primary schools/sections %
Khar	13	22
Utman Khel	10	11
Salarzai	21	29
Nawagai	12	10
Mamund	29	21
Barang	15	5
Chamarkand	N/A	2

The enrollment by class from 1980-81 to 1990-91 are shown in Table XI.6. This data also includes the enrollment of the primary sections of the middle and high schools. Using the 1981 Census data and the 3.1 percent annual population growth rate, the number of males age 5-9 is estimated to equal 31,343 in 1991. The total primary enrollment for boys was 20665 in 1990-91. This indicates an approximate participation rate of 66 percent of the eligible males. This figure is even higher than the national participation rate.

Table XI.6 Boys' Primary Level Enrollments

Class	I jr	I sr	II	III	IV	Total
1980-81	-	4050	1818	1589	1286	8743
1981-82	1611	2145	1973	1667	1479	8875
1982-83	1035	4366	1830	1507	1321	10059
1983-84	3898	3237	2433	1917	1516	13001
1984-85	4484	3293	2560	2002	933	13272
1985-86	4635	3180	2743	2172	1785	14515
1986-87	4384	3419	2812	2434	1946	14995
1987-88	5073	3601	3026	2750	1786	16237
1988-89	5116	4005	2861	2587	2236	16806
1989-90	6558	4483	3625	2977	2437	20080
1990-91	6797	4908	3737	3085	2138	20665

The drop-out rate is high if compared to class enrollment for various years. The total enrollment increased almost 2.5 times from 1980-81 to 1990-91.

According to the Agency Education officer, almost 50 percent of the 2-room primary schools have more than 80 students. In all the boys' primary schools, around 25 children under the age of five are attending schools although they are not admitted. All boys' primary school teachers are trained and locally domiciled.

A comparison of boys' primary education facilities in four Tribal Agencies with Bajaur Agency follows:

Table XI.7 Comparison of Boys' Primary Schools and Enrollment in Various Tribal Agencies

Agency	No. of Primary schools & sections in 1989-90	Enrollment	Estimated Population in 1989	Area sq. km.
Kurram	213	17943	385,553	3,380
SWA	256	13503	395,000	6,619
NWA	238	15492	305,000	4,707
Orakzai	160	8896	472,851	1,583
Bajaur	199	20080	375,968	1,290

Bajaur Agency has a larger boys' primary school enrollment than the other four Agencies despite the fact that it has only a slightly larger number of schools than Orakzai Agency. Bajaur has the least area in terms of sq. km. of all the Agencies; therefore, students might have access to many schools nearby.

Field visits of a few primary schools were made by the researcher. The building conditions were poor, window glass was broken, and there was no electricity and no piped water. No regular maintenance is carried out. Even floor mats were not available for the students to sit on.

B. Middle Level

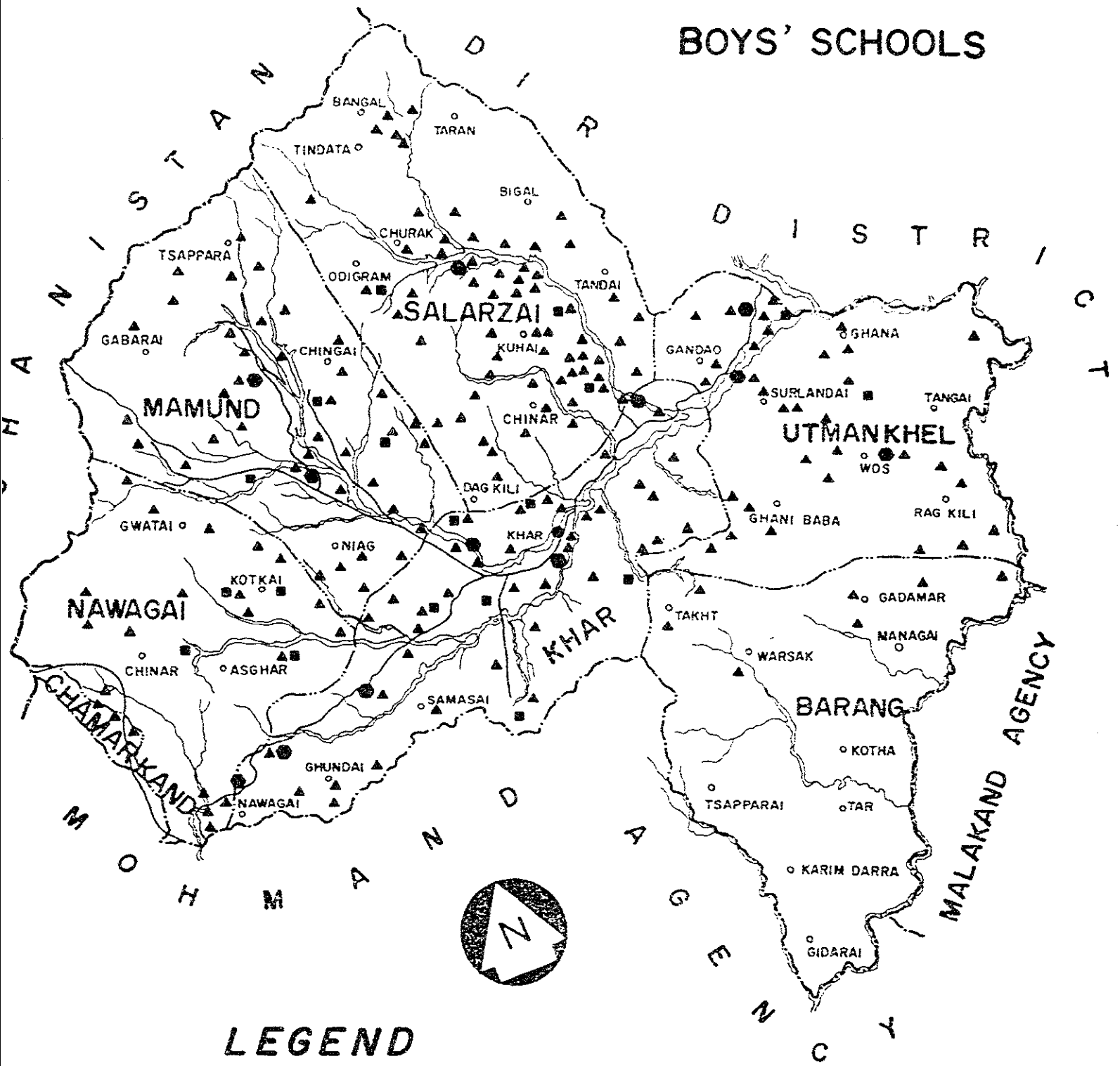
All middle schools offer fifth class while only a few primary schools do. Fifth class is therefore, counted with the middle level enrollment in this assessment. Middle level is considered fifth class through the eighth class.

1. Girls' Middle Education

The first girls' middle school was opened in 1975 in Khar. Very few girls have the opportunity to extend their education beyond the fourth class. In December 1990, only two middle schools for girls were functioning. One is in Khar tehsil and the other is in Nawagai tehsil. At the Khar middle school, the enrollment is increasing, while the enrollment is constant at Nawagai because it is situated far from the populated area.

BAJAUR AGENCY

MAP # XI.II



LEGEND

- INTERNATIONAL BOUNDARY
- TRIBAL BOUNDARY
- TEHSIL BOUNDARY
- EXISTING PAVED ROAD
- RIVER / STREAM / KHWAR
- AGENCY HEADQUARTER
- VILLAGES / TOWNS
- PRIMARY SCHOOLS
- MIDDLE SCHOOLS
- HIGH SCHOOLS

0 4 8 12 16 KM

Table XI.8

Girls' Middle Level Enrollment

Year	5th	6th	7th	8th	Total
1980-81	12	25	16	20	73
1981-82	9	2	2	4	17
1982-83	8	6	2	-	16
1983-84	3	7	4	2	18
1984-85	4	6	6	5	21
1985-86	50	5	3	5	63
1986-87	11	9	3	7	30
1987-88	33	12	10	5	60
1988-89	52	18	7	19	96
1989-90	46	17	19	8	90
1990-91	49	17	9	8	83

The enrollment in the middle classes is very low. There are few schools and there are problems in recruiting teachers. Parents may not be very interested in sending their daughters to school, and because of this, the eligible female participation rate is negligible.

2. Boys' Middle Education

The first boys' middle school which was upgraded from a primary school, was started in 1973-74 in Khar. As of late 1990, there were 18 middle schools for boys in Bajaur Agency. The number of schools with middle sections in 1990-91 is as follows:

Table XI.9 Number of Boys' Middle Schools by Tehsil

S.No	Sub-Division	Tehsil	Percentage of Agency Pop. %	No. of middle schools & sections	Percentage of Agency boys' middle schools %
1.	Khar	Khar	13	8	21
2.	"	Utman Khel	10	6	15
3.	"	Salarzai	21	5	13
4.	Nawagai	Nawagai	12	5	13
5.	"	Mamund	29	15	38
6.	"	Barang	15	-	-
7.	"	Chamarkand	N/A	-	-

The enrollment in the middle classes for the last 10 years is given in Table XI.10.

Table XI.10 Boys' Middle Level Enrollment

Year	5th	6th	7th	8th	Total
1980-81	1092	527	404	153	2176
1981-82	1197	503	389	279	2368
1982-83	1153	813	626	416	3008
1983-84	1250	813	731	524	3318
1984-85	1146	890	724	581	3341
1985-86	1308	872	693	534	3407
1986-87	1522	1012	743	565	3842
1987-88	1548	1062	752	621	3983
1988-89	1715	1157	868	629	4389
1989-90	1846	1340	992	792	4970
1990-91	1938	1357	1042	799	5136

The participation rate of eligible male children from 10-14 years is roughly 15 percent. This participation rate is high in Khar sub-division because it has more middle schools and sections than Nawagai sub-division.

A comparison of boys' middle schools facilities in Bajaur Agency with four other Tribal Agencies is as follows:

Table XI.11 Comparison of Boys' Middle Schools in Different Tribal Agencies

Agency	No. of middle schools & sections in 1989-90	Enrollment	Estimated Population in 1989	Area sq.km.
Kurram	43	3527	385,553	3,380
SWA	54	3421	395,000	6,619
NWA	55	3529	305,000	4,707
Orakzai	12	1446	472,891	1,538
Bajaur	18	4970	369,337	1,290

Bajaur Agency has a much smaller number of middle schools and sections than the other three agencies (except Orakzai), but it has a high enrollment. This is why almost all the middle schools and sections are over-crowded.

C. Secondary Level

Secondary schools include 9th and 10th classes. All high schools in the Agency have the lower grades as well. High school enrollment is counted as being class 9 and class 10.

1. Girls' Secondary Education

The first girls' high school started in 1975 in Khar by upgrading a middle school. The enrollment in high school is low because of a lack of transportation for girls, all of whom observe purdah.

The enrollment in high school for the last 10 years is given in Table XI.12. The participation rate of females age 15-19 is negligible.

Table XI.12 Girls' Secondary Level Enrollment

Year	Class 9	Class 10	Total
1980-81	10	10	20
1981-82	-	-	-
1982-83	-	-	-
1983-84	-	-	-
1984-85	-	-	-
1985-86	-	-	-
1986-87	3	-	3
1987-88	3	-	3
1988-89	4	6	10
1989-90	6	3	9
1990-91	3	5	8

2. Boys' Secondary Education

As of December 1990, there were 15 high schools for boys functioning in Bajaur Agency. The number of schools in each tehsil is as follows:

Table XI.13 Boys' Secondary Schools by Tehsil

No.	Sub-Division	Tehsil	Percentage of Agency Pop. %	No. of high schools as of Dec.1990	Percentage of Agency boys' high schools %
1.	Khar	Khar	13	4	33
2.	"	Utman Khel	10	3	25
3.	"	Salarzai	21	2	17
4.	Nawagai	Nawagai	12	1	8
5.	-	Barang	15	-	-
6.	-	Chamarkand	N/A	-	-
7.	-	Mamund	29	2	17

The enrollment in high schools for the last 10 years is given in Table XI.14.

Table XI.14 Boys' Secondary School Enrollment

Year	Class 9	Class 10	Total
1980-81	193	154	347
1981-82	180	155	335
1982-83	141	204	345
1983-84	268	144	412
1984-85	311	246	557
1985-86	462	298	760
1986-87	421	429	850
1987-88	384	396	780
1988-89	395	373	768
1989-90	399	418	817
1990-91	525	253	778

The participation rate for the eligible age group of males 15-19 is roughly 4 percent.

A comparison of Bajaur Agency secondary school facilities with the other four Tribal Agencies is as follows:

Table XI.15 Comparison of Boys' Secondary Schools in Various Tribal Agencies

Agency	No. of secondary schools in 1989-90	Enroll.	Estimated Population in 1989	Area Sq.Km.
Kurram	18	909	385,553	3,380
SWA	17	471	395,000	6,619
NWA	16	1202	305,000	4,707
Orakzai	12	330	472,851	1,538
Bajaur	12	817	369,337	1,290

D. Public Schools

There are two public schools located in Khar. One public school under the control of the Political Agent had 400 students enrolled in 1990-91. It has 16 teachers. The second school, the Model Public School, is under the control of the Bajaur Scouts and had 300 students in 1990-91.

E. Colleges

There is one degree college in Khar. It was established in 1974 as an intermediate college. In 1978, it was upgraded to a degree college although the facilities are still those of an intermediate college. There were 840 students enrolled in this college in 1991. There are only 8 classrooms and, therefore, classes are held in the open. There are 25 teachers assigned to this college. Because of the lack of rooms, teachers often teach a class ranging from 80 to 330 students in one classroom.

F. Alternate Education

1. Mohallah and Mosque Schools

Bajaur has 5 mohallah schools for girls. One part-time teacher is assigned to each school. There were 13 mosque schools as of June 1991. In each mosque school, there is one trained and one theology teacher assigned on a part-time basis.

2. Adult Literacy Center

There are four adult literacy centers in Bajaur Agency. These are located at Kharkano, Balanjur, Tankhata, Sikandra, Qazidaro and Zar Bandar. According to the Assistant Educational Officer, these literacy centers are not operating successfully.

G. Industrial Homes

There are six industrial homes operating in Bajaur Agency. These are located at Swalkala, Inayat Kalay, Khar, Khar colony, Barkhalzo and Khono. 130 students were enrolled in these centers in 1990-91. According to the Assistant Education Officer, the two industrial homes, one at Swalkola and the other at Khar colony, are functioning well.

H. Administration of Agency Education

One Agency Educational Officer is in charge of the Agency education operations. There are three Assistant Education Officers, one for female and two for male education. There is one literacy supervisor who supervises mosque schools, mohallah schools and literacy centers. There is also one supervisor for physical education.

I. Technical Education

There are two technical training institutes operating in Bajaur Agency under the Board of Technical Education. One is the Government Commercial Training Institute at Khar, and the second is the Government Vocational Institute in Inayat Kalay.

The Government Commercial Training Institute was established in 1978. It offers a two-year certificate course in commerce equivalent to FA, FSc (equivalent to 12 years schooling in Pakistan). A maximum of 60 students are admitted each year. There were 100 students enrolled in 1990-91. Six trained teachers have been assigned to this institute. The institute does not has sufficient training equipment for the practical training of students, and the institute building is inhabitable. Two residential hostels, one for the staff and the other for students, are also attached to the Institute.

The Government Vocational Institute in Inayat Kalay was established in 1986. This institute offers a two-year certificate course in electrical technology, wood working and machine tooling. Students are admitted after the completion of high school. In 1990, 45 students were enrolled, and four trained teachers were assigned to this Institute in addition to a principal. There are two residential hostels, one for teachers and one for students that are attached to the Institute.

According to the principal, sufficient funds are not provided to purchase raw material for the students to be used for practical training. Modern equipment is not available. Students are trained in the old, traditional technologies. Scholarships are not given to the students of this Institute as they are given to the students of the Degree college and the Commercial Institute.

J. Field Observations

The researcher visited the Government middle school at Tank Khatta in Khar Tehsil. There are four rooms in this school which are in a decrepit condition. These rooms are not used by the students, instead, classes are held on the veranda and in the open air. There are 128 students in the middle classes and 162 in the primary classes. Of these, the fifth and sixth classes are over crowded. The school is assigned 13 trained teachers for the 50 unregistered children under the age of 5 who attend this school.

No regular maintenance of this school is carried out. Even mats are not available for the students to sit on. There is no piped water in the school.

The second school visited was a primary school in Ler Khel Ozo in Mamund tehsil. The school building consists of four rooms and is in very poor condition. The roof of the building is leaking, windows are broken and no proper maintenance has been carried out. There is no electricity and no piped water for the school. There is no boundary wall of this school and residential quarters for teachers have not been constructed. Three trained teachers are assigned to this school for the 270 students enrolled. This school is also over crowded.

The third school visited by the researcher was a high school in Gardian, Utman Khel tehsil. There are 245 students enrolled in the primary section in two rooms, 177 in the middle school section of four rooms, and 54 enrolled in the high school section of two rooms in this school. 17 teachers are assigned to the middle and high school sections, and 5 teachers to the primary section. There is one science laboratory and no library in the school. Regular maintenance is not carried out. The roofs of the buildings leak during the rainy season, and although electricity is available, there is no piped water. The high and middle sections of the school have wooden furniture, but the primary section does not even have mats.

XII. HEALTH

The Agency is provided with the following facilities:

- o 2 Civil Hospitals
- o 17 Basic Health Units
- o 1 Rural Health Center (Not functioning due to the non availability of staff).
- o 10 Civil Dispensaries

In addition, some of the facilities have EPI (Expanded Program for Immunization) centers with designated staff including mobile and outreach teams.

The Agency Surgeon and his Field Senior Medical Officer (FSMO), are stationed in Khar and are responsible for supervising the above-mentioned facilities. Owing to considerable distances, the insecurity and lack of government funding for transportation, it is difficult to effectively supervise these far-flung and remote facilities.

A partly functional Malaria Control Program exists in the Agency, hindered by the lack of staff and proper funding. The same is true for the Leprosy Control Program in the Agency.

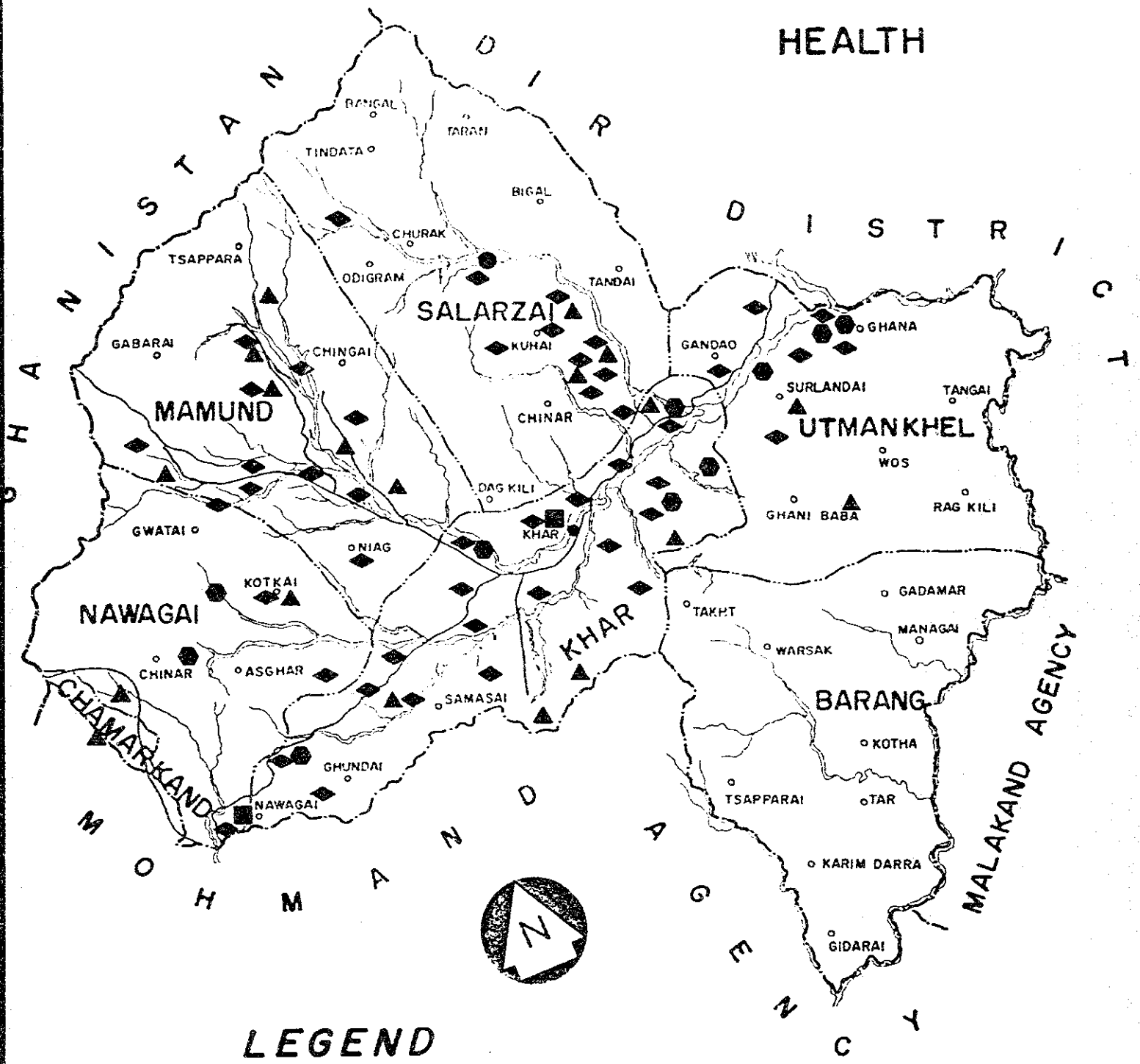
Staffing skilled posts in the Agency is very difficult. The number of vacancies for physicians is very high. Yet the Civil Headquarters Hospital in Khar is well staffed and may even be over staffed with medical officers (one for every 3.39 beds and 7.23 out patients daily, assuming 265 work days for 1990). There are also 17 compounders and a dental surgeon seeing patients. The clustering of physicians at Khar is perhaps explained by the fact that physicians generally resist rural postings which are more isolated and less comfortable.

Recruiting female health professionals is problematic. There are no Lady Health Visitors (LHVs), and only the Dais (midwives) at Khar civil hospital appear to have received any training. At most facilities, there is no one to supervise the working of these dais, most of whom are simply local, traditional midwives. Under staffing means that a good referral system cannot be established; patients visiting a dispensary who need to be referred to a physician must be sent to a distant hospital, or out of the Agency. Generally, people who have the means to leave the Agency do so for serious illnesses. Many go to Peshawar out of necessity or preference.

The staffing problem is one that cannot be easily solved without more financial incentives to work in the Agency. The Health Department is also considering a proposal to limit the first three years of government service of a graduating physician to that Agency where he is domiciled.

BAJAUR AGENCY

HEALTH



LEGEND

- INTERNATIONAL BOUNDARY
- TRIBAL BOUNDARY
- TEHSIL BOUNDARY
- EXISTING PAVED ROAD
- RIVER / STREAM / KHWAR
- AGENCY HEADQUARTER
- VILLAGES / TOWNS
- HOSPITALS
- DISPENSARY
- BASIC HEALTH UNIT
- RURAL HEALTH CENTER
- TUBEWELLS FOR POTABLE WATER

0 4 8 12 16 KM

Data on case loads was obtained from the Agency Surgeon's office.

A) Hospitals

There are two hospitals in the Agency. These are staffed and located as follows:

I. Civil Headquarters Hospital, Khar.

Table XII.1 (a) staffing.

S.No	Name of Posts	Sanctioned	Occupied	Vacant
1.	Agency Surgeon	1	1	-
2.	Surgical Specialist	1	1	-
3.	Medical Specialist	1	1	-
4.	Eye Specialist	1	1	-
5.	Gynecologist	1	1	-
6.	Senior Medical Officers	3	3	-
7.	Medical Officers	14	14	-
8.	Women Medical Officers	2	-	2
9.	Social Medical Officer	1	-	1
10.	Dental Surgeon	1	1	-
11.	Nursing Sister	1	-	1
12.	Dental Technician	1	1	-
13.	Lady Health Visitor	1	-	1
14.	Senior Clerk	1	1	-
15.	Blood Bank Technician	1	1	-
16.	Laboratory Technician	1	1	-
17.	Radiologists	2	2	-
18.	Anaesthesia Assistant	1	1	-
19.	Compounders	17	17	-
20.	A.S.V.	2	2	-
21.	O.T. Assistant	2	2	-
22.	Laboratory Assistant	2	2	-
23.	Junior Clerks	2	2	-
24.	Vaccinators	6	6	-
25.	Masseur	1	1	-
26.	Drivers BPS-6	1	1	-
27.	Driver BPS-4	1	1	-
28.	Sanitary Supervisor	1	1	-
29.	Sanitary Petrol	3	3	-
30.	Blood Bank Attd.	1	1	-
31.	Laboratory Attd.	2	2	-
32.	X-Ray Attd.	2	2	-
33.	Ward Orderlies	8	8	-
34.	Dais	2	2	-
35.	Behisties (Water Carrier)	3	3	-
36.	Naib Qasid (Peon)	2	2	-

S.No	Name of Posts	Sanctioned	Occupied	Vacant
37.	Cleaner	1	1	-
38.	Dhobis	1	1	-
39.	Malis	2	2	-
40.	Cooks	2	2	-
41.	Sweepers	9	9	-
42.	Chowkidars	6	6	-
43.	Leprosy Technician	2	2	-
44.	Malaria Supervisor	2	2	-

The Agency Headquarters Hospital has 78 beds, classified as:

34 Surgical Ward
34 Medical Ward
10 Eye Ward

Table XII.1 (b) case loads (outpatients)

Year	Male	Female	Male Child	Female Child	Total
1988	9051	7619	5965	5037	27672
1989	14876	10597	6580	4460	36513
1990	16293	11736	8383	7686	44098

The hospital has a blood bank, a laboratory and a dental unit. An ECG is available, but the post for an ECG technician has not been sanctioned. The hospital has surgical, medical, eye and gynecology specialists. They are provided with residential bungalows which are in good condition. On the day of the USAID researcher's visit, the OPD register showed 142 patients. The major complaints arose from PUO (fever of unknown origin), skin infections, urogenital infections, gastroenteritis, and ENT (Ear, Nose and Throat) related symptoms. The hospital had a supply of 675 packets of ORS (Oral Rehydration Salts), although the supply for 1991-92 had not been received.

II. Civil Hospital, Nawagai

Table XII.2 (a) Staffing

S.No.	Name of Post	Sanctioned Positions	Occupied	Vacant
1.	Medical Officer	1	1	-
2.	O.T. Assistant	1	1	-
3.	Radiologist	1	1	-
4.	Laboratory Assistant	1	-	1
5.	Compounder	2	2	-
6.	Driver	1	1	-
7.	O.T. Attendant	1	1	-

S.No.	Name of Post	Sanctioned Positions	Occupied	Vacant
8.	Laboratory Attendant	1	1	-
9.	X-Ray Attendant	1	1	-
10.	Dais	2	2	-
11.	Ward Orderlies	2	2	-
12.	Chowkidars	1	1	-
13.	Malis	1	1	-
14.	Cooks	1	1	-
15.	Sweepers	1	1	-

The hospital has 8 beds classified as:

4 Male
4 Female

Table XII.2 (b) case loads (outpatients)

Years	Male	Female	Total
1989	1991	102	2693
1990	4552	3140	7692

The case load figures for 1989 and 90 show an almost three-fold increase in the number of patients, although the facility does not have a stock of medicines, a dental unit, or a functional laboratory. The facility did not have any supplies of ORS.

The hospital has no inpatients because of its remote location from the local bazaar, where medicines are available. The hospital is equipped with X-Ray equipment and a laboratory unit kit, but no technicians to run it. The Medical Officer has been provided with a bungalow, while the rest of the staff are provided with 3 double room quarters and 6 single room quarters, all of which are in good condition. Potable water and electricity are available at the facility which is in good condition overall. The facility lacks a boundary wall. The OPD register on the day of the visit showed 10 patients whose major complaints were due to PUO, dysentery, arbhiritis and urinary tract infections.

B) Rural Health Center, Pashat

It is the only facility of its kind in the Agency and is not yet operational due to the non-availability of staff.

C) Basic Health Units

A description of the Agency's BHUs in terms of staffing and case loads in 1988, 1989 and 1990 is given in Table XII.3.

Table XII.3

Staffing and Case Loads 1988, 1989 and 1990

Location (BHU)	Staff	Year	Male	Female	Total	Pop.
BHU Bilot	1 Med.Officer 1 Health Tech. 1 Dai 2 Class-III	1988 1989 1990	4211 830 398	1998 720 248	6209 550 646	8000 8000 8000
BHU Mandal	1 Health Tech. 1 Dai 3 Class-IV	1988 1989 1990	718 169 867	321 58 733	1039 227 1600	10000 10000 10000
BHU Chinagai	1 Health Tech. 1 Dai 3 Class-IV	1988 1989 1990	27 249 439	22 249 465	49 498 904	10000 10000 8000
BHU Laghari	1 Med.Officer 1 Health Tech. 1 Dai 2 Class-IV	1988 1989 1990	1395 496 1204	1526 263 411	2921 759 1615	8000 8000 8000
BHU Mina	1 Health Tech. 1 Dai 3 Class-IV	1988 1989 1990	1938 402 287	1575 295 218	3513 697 505	8000 8000 8000
BHU Malangai	1 Health Tech. 1 Dai 3 Class-IV	1988 1989 1990	738 555 119	673 119 555	1411 674 674	8000 8000 8000
BHU Kotki Charmang	1 Med.Officer 1 Health Tech. 1 Dai 3 Class-IV	1988 1989 1990	N/A N/A 1432	N/A N/A 1003	- - 2435	7700 7700 7700
BHU Loasadan	1 Med.Officer 1 Health Tech. 1 Dai 3 Class-III	1988 1989 1990	N/A N/A 120	N/A N/A 468	- - 588	8000 8000 8000

BHU	1 Health Tech.	1988	N/A	N/A	-	9000
Lar Madac	1 Dai	1989	N/A	N/A	-	9000
	3 Class-IV	1990	40	11	51	9000
BHU	1 Health Tech.	1988	N/A	N/A	-	8000
Chamar-	1 Dai	1989	N/A	N/A	-	8000
kand	3 Class-IV	1990	410	304	714	8000
BHU	1 Med.Officer	1988	N/A	N/A	-	8000
Qazafi	1 Health Tech.	1989	N/A	N/A	-	8000
	1 Dai	1990	1087	518	1605	9000
	3 Class-IV					
BHU	1 Med.Officer	1988	87	26	113	9000
Loesum	1 Health Tech.	1989	495	207	702	9000
	1 Dai	1990	1053	514	1627	9000
	3 Class-IV					
BHU	1 Med.Officer	1988	1104	733	1837	9000
Raghana	1 Health Tech.	1989	160	54	214	9000
	1 Dai	1990	617	259	876	9000
	3 Class-IV					
BHU	1 Health Tech.	1988	1807	1198	3005	8000
Chakhai	1 Dai	1989	417	35	452	8000
	3 Class-IV	1990	660	535	1195	8000

BHU, Min & Arang] STAFF NOT
BHU, Kharai Kamar] SANCTIONED

BHU, Kotki Lar] UNDER
Salarzai] CONSTRUCTION

Only 50% of the BHU's have been assigned physicians. Usually, the staff of every BHU consists of medical technicians and dais. BHUs at Minz Arang and Kharai Kamar have no staff assigned to them. There seems to be no proportional relationship between the BHU staff and the population it serves. Some of the BHUs with fewer staff have a heavier work load then other BHUs with more staff and lighter work loads.

BHUs do not function as referral centers. Generally, patients are referred to hospitals when greater expertise or better facilities are required.

D) Civil Dispensaries

All Dispensaries are staffed with one compounder. Dais are attached to some units. The following table shows the status of these facilities in terms of staffing and case loads in 1988, 1989 and 1990.

Table XII.4

Staffing and Case Loads 1988, 1989 and 1990

Location (Civil Dispensary)	Staff	Year	Male	Female	Total	Pop.
Civil Dis. Gardai	1 Compounder 1 Dai 2 Class-IV	1988 1989 1990	427 1513 1270	448 549 752	875 2062 2023	7700 7700 7700
Civil Dis. Kulala-1	1 Compounder 1 Dai 2 Class-IV	1988 1989 1990	912 1278 1290	275 727 281	1187 2005 1571	8400 8400 8400
Civil Dis. Kulala-2	1 Compounder 1 Dai 2 Class-IV	1988 1989 1990	1127 824 395	874 746 215	2001 1670 610	7700 7700 7700
Civil Dis. Tarai	1 Compounder 1 Ward Orderly 2 Class-IV	1988 1989 1990	2176 2356 -	1656 1790 -	3832 4146 -	7000 7000 7000
Civil Dis. Dabdaboo	1 Compounder 1 Dai 2 Class-IV	1988 1989 1990	819 1208 1069	583 869 635	1402 2077 1704	6000 6000 6000
Civil Dis. Zor Bandar	1 Compounder 1 Dai 1 Ward Orderly 2 Class-IV	1988 1989 1990	1504 568 1089	833 163 510	2387 731 1599	7700 7700 7700
Civil Dis. Halki Charmang	1 Compounder 1 Dai 2 Class-IV	1988 1989 1990	2097 791 1228	1905 620 891	4002 1411 2119	7700 7700 7700
Civil Dis. Sarkari Qilla	1 Compounder 1 Dai 1 Ward Orderly 2 Class-IV	1988 1989 1990	2502 3221 2448	1783 1800 1416	4295 5021 3664	7700 7700 7700
Civil Dis. Inayat	1 Compounder 1 Ward Orderly 1 Dai 2 Class-IV	1988 1989	1927 497 906	265 233 700	2192 730 1616	N/A N/A N/AQilla
Civil Dis. Jar	1 Compounder 1 Ward Orderly 1 Dai 2 Class-IV	1988 1989 1990	3803 892 563	1478 721 272	4599 1613 836	9400 9400 9400

Each dispensary seems to cover a population ranging from 6000 to 9400 persons with the same number of staff. Loads vary from dispensary to dispensary. The civil dispensary in Sarkari Qilla had a work load of 3664 patients for 1990, while the civil dispensary in Kullala No.2 had a work load of 610 patients for 1990.

E) ORAL Rehydration Therapy (ORT) and EPI Service

1. ORT

Agency authorities had no readily available record of the distribution of ORT by health units. The only available information was the receipt of ORS packets from EPI (Expanded Program for Immunization) and the government as listed below:

Number	Receiving Date	Remarks
3000	June 18, 1990	E.P.I
5000	March 11, 1991	Government aid for earthquake
1200	Sept. 2, 1991	E.P.I

The details of patients provided with ORT were not available from the Agency Surgeon.

E.P.I. Bajaur

The following supervisory staff is available in Bajaur Agency for EPI:

Table XII.5 Staffing for EPI

Staff Strength as of 1990	Position	Available
FSMO	1	1
Superintendent Vaccination	1	1
FSV	2	2
Senior Clerk	1	1
Junior EPI Technician	22	22
Senior EPI Technician	8	8
Driver	1	1

All staff members are based in Khar. One mobile team of junior EPI technicians visits field locations and operates at different EPI outlets. One vehicle is assigned for field duty.

According to the Deputy Director EPI, the results for Bajaur are not very encouraging because of inadequate communications, severely cold weather, and the non-availability of electricity, transport and workers. Every Agency EPI office is given an annual as well

as monthly target, which they try to achieve. The achievements for Bajaur Agency in terms of targets for nine months of 1991 are as follows:

Yearly target	Monthly target	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep
13881	1166	52.5 %	54.8 %	66.9 %	66.4 %	78.9 %	72.0 %	82.2 %	75.7 %	81.4 %

Table XII.6 shows a comparative analysis of treatment for various diseases for the last three years.

Table XII.6

EPI Bajaur Immunization Performed Yearly (All Age Groups)

Year	ECG	POLIO I	POLIO II	POLIO III	Br.	D.P.T I	D.P.T II	D.P.T III	Br.	D.T I	D.T II	T.T (Pl+EGA) I	T.T (Pl+EGA) II	T.T (Pl+EGA) III	Measles
1988	28896	28912	25515	12109	2093	28907	25515	12109	2066	11321	11555	11136	8832	1258	15138
1989	17902	18142	18475	18808	1180	18142	18475	18808	1180	-	-	9212	8619	2411	15670
1990	11774	11764	10888	11439	230	11764	10888	11439	230	-	-	8663	7136	2779	8338

Table XII.7 shows a breakdown of children of various ages and the treatment provided. Section one contains the population of Bajaur Agency and the estimated 3.6 percent of the population between the age of 0-11 months (a GOP standard). BCG is given for tuberclosis (one complete dose). Three doses of Poliomyelitis and DPT are given against polio and tetanus respectively. The 16.5 percent target group consists of ladies of child bearing age between 15-45 years. This group is given tetanus toxide. In the same way, a certain number of patients are given doses against measles. Similarly, sections II and III explain the number of patients of different age groups treated for various diseases.

Private Practioners

The agency does not have any registered private practioners.

ble VII.7

EPI Bajaur Yearly Projected Population/ Target and Vaccinations Performed
Children 0-11 Months and Women

ar	Projected Popul.	0-11 months children (3.6%)	B.C.G.	Poliomyelitis I	Poliomyelitis II	Poliomyelitis III	D.P.T. I	D.P.T. II	D.P.T. III	4.5% Target	T.T. (PL+CBA) I	T.T. (PL+CBA) II	T.T. (PL+CBA) III	Measles
88	353096	12711	8883	8793	6065	5238	8793	6065	5238	15889	11136	8832	1258	5754
89	374600	13485	13150	13189	12654	12503	13189	12654	12503	16857	9212	8619	2411	10165
90	385838	13890	11635	11616	10490	10921	11616	10490	10921	17362	8663	7136	2779	8105

Children 12-23 Months

ar	BCG	Poliomyelitis I	Poliomyelitis II	Poliomyelitis III	Booster	D.P.T. I	D.P.T. II	D.P.T. III	Booster	Measles
88	8671	8798	7895	6871	1085	8793	7895	6871	1058	9384
89	4752	4953	5821	6305	1180	4953	5821	6305	1180	5505
90	139	148	348	518	230	148	348	518	230	233

Children 2-4 Years

ar	BCG	Poliomyelitis I	Poliomyelitis II	Poliomyelitis III	Booster	D.P.T. I	D.P.T. II	D.P.T. III	Booster	D.T. I	D.T. II	D.T. III
88	10842	11321	11555	-	1008	11321	11555	-	1008	11321	11555	-
89	-	-	-	-	-	-	-	-	-	-	-	-
90	-	-	-	-	-	-	-	-	-	-	-	-

ildren 0-11 months = 3.6% of total population
ildren 12-23 months = 3.4% of total population
(Pregnant Ladies) = 4.5% of total population
A (Child Bearing Age Ladies) = 16.5% of total population
T Stands for Deptheria, Pertussis, Tetanus
Stands for Diptheria, Tetanus
T Stands for Tetanus Toxoid

VII. ELECTRIFICATION

A. Extent of Electrification

According to the Sub-Divisional Officer (SDO) in charge of Bajaur Agency electrical operations, as of August 1991, seventy five percent of the villages in Bajaur Agency have been electrified. The Agency is supplied electricity through a 66 kilovolt grid station located in Khar. This grid station has transformers of 10 to 13 megavolt amperes. There are five feeders going to five different areas of Bajaur Agency from this grid station. One goes to Nawagai, the second to Munda, the third and fourth feeders to Kid Kot-1 and Kid Kot-2, and the fifth to Khar, while the installation of the sixth feeder to Nawagai was in process as of August 1991.

The number and breakdown of connections as of August 1991 are as follows:

Legal domestic connections	=	11675
Legal commercial connections	=	1492
Industrial connections	=	160
Tubewell connections	=	133

In addition, there are twice as many illegal connections, most of which are residential.

Some information about the average electrical consumption is as follows:

- Average monthly household consumption	3000 Kilowatt hours (KWh)
- Average monthly consumption of electricity in tubewells	1440 Kilowatt hours (KWh)
- Average monthly consumption of commercial users	112 Kilowatt hours (KWh)
- Average monthly consumption of industrial users	1500 Kilowatt hours (KWh)

B. Administration

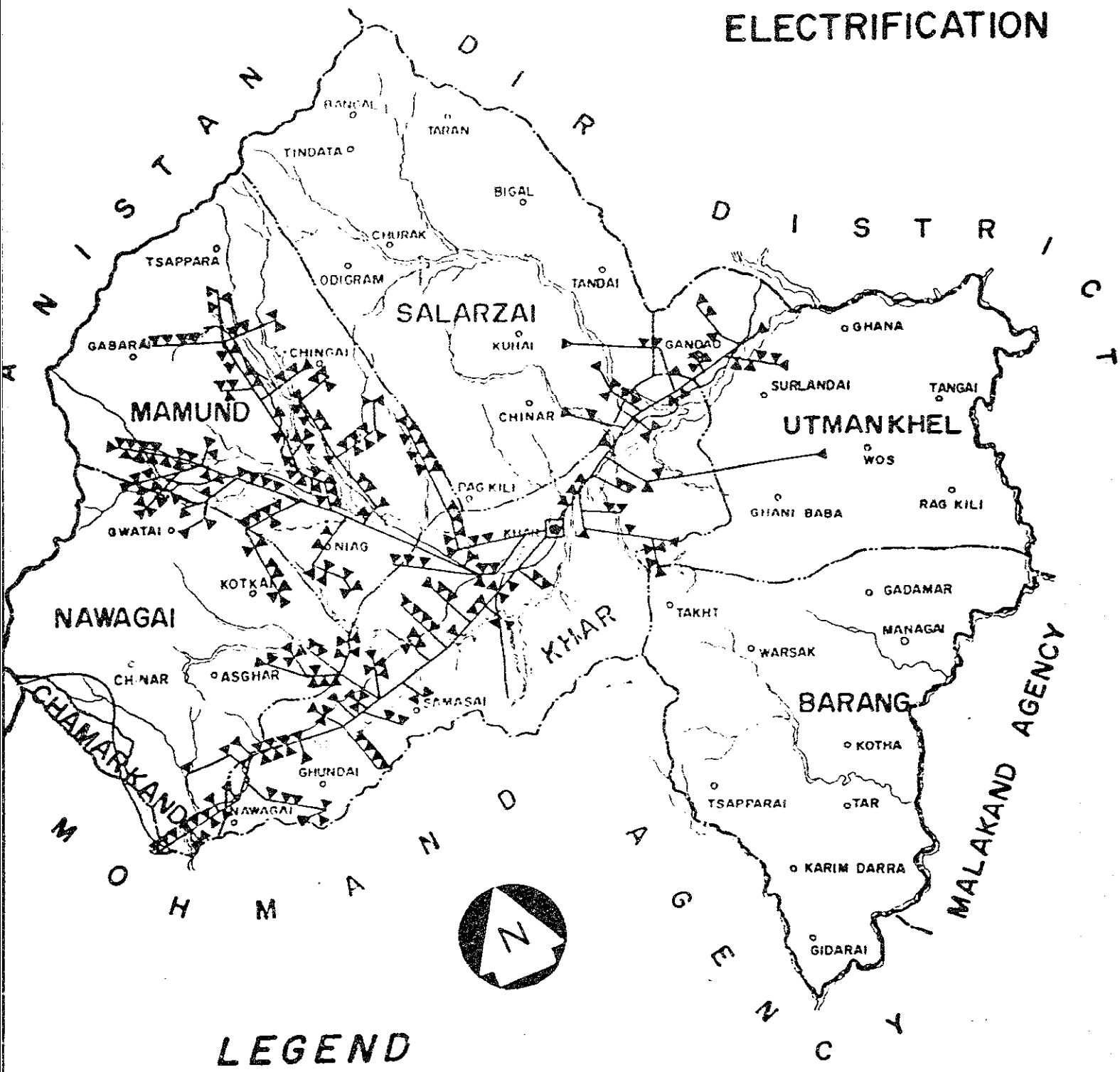
A Sub-Divisional Officer (SDO), is in charge of Bajaur Agency electrical operations. His office is located in Khar. He supervises three Line Superintendents, one of whom is responsible for the maintenance of feeders, one for the recovery of bills, and the third for meter reading. There are also 58 line staff.

There are five complaint offices one each in Khar, the Political Agency colony in Khar, Anayat Kila, Saddique Abad and Nawagai. These are all located in accessible areas.

MAP # XIII.I

BAJAUR AGENCY

ELECTRIFICATION



LEGEND

- INTERNATIONAL BOUNDARY
- TRIBAL BOUNDARY
- TEHSIL BOUNDARY
- EXISTING PAVED ROAD
- RIVER / STREAM / KHWAR
- AGENCY HEADQUARTER
- VILLAGES / TOWNS
- GRID STATION 66 KV

0 4 8 12 16 KM

C. Problems

There is a ninety rupees flat rate charged for a residential connection regardless of use; this amounts to a subsidy. For tubewells and industrial connections, charges are the same as in the settled areas and theoretically, depend upon consumption. According to the meter, up to May 1991, not even a single rupee has been paid by industrial consumers. Collection is difficult and often must be made through the Political Agent which is often unsuccessful. In March 1991, WAPDA supplied 8 million units of electricity to Bajaur Agency while the payments amounted to only 57,000 rupees for that month. Even if the charges were one rupee per unit, then it could be calculated that there would be a loss of around 7.943 million rupees to the national exchequer for that month.

XIV. INVESTMENT IN DEVELOPMENT

1. Allocation Process in FATA:

The Federal Government allocates funds to Federal Government Institutions such as FATA D.C and to the Provincial Government for the execution of schemes through GONWFP Departments. In addition, each Senator and member of the National Assembly are allocated five million rupees for development schemes in their respective areas.

a) FATA D.C Allocation Process.

The Steps in the allocation process for FATA D.C are as follows:

- Field officers of each Tribal Agency prepare development schemes for the next year.
- The proposed schemes are approved by the concerned Political Agent.
- The proposed schemes are sent to the respective sections of FATA D.C where they are consolidated for all Tribal Agencies.
- The consolidated schemes are then sent to the planning & development section of FATA D.C where a proposed Annual Development Plan (ADP) for FATA D.C is prepared and sent to the Ministry of Frontier Regions in Islamabad. This Ministry gets its allocation through the Federal Ministry fo Finance and Planning.
- The actual allocations by the Federal Government are sent to FATA D.C where the proposed ADP is changed into a new ADP according to the actual financial allocations.
- This ADP is revised by the chairman FATA D.C and approved by the Board of FATA D.C and printed.

b) Provincial Government Allocation Process.

The steps in the allocation process for the Provincial Government are as follows:

- Field offices of each Concerned Provincial Department prepare schemes for the next year. These are approved and priorities are given by Political Agents

- The consolidated proposed ADP of all Tribal Agencies are sent to the FATA section of P&D Department GONWFP. The proposed ADP schemes are discussed at the P&D FATA section and then sent to the Governor of NWFP.

- The Governor discusses the ADP in a meeting with the heads fo all concerned departments and approves the final ADP.

c) MNA/Senator Allocations:

Each Senator and MNA prepares schemes worth 5 million rupees in his area. These schemes are given to the Federal Local Government & Rural Development Department. After approval, these schemes are executed by the LG&RD Department.

2. Analysis of Investment Allocations from 1974-75 to 1992-93:

The total investment for Bajaur Agency from 1974-75 to 1992-93 was 998 million rupees. Bajaur Agency ranks fourth among all Agencies in terms of total allocations. South Waziristan, North Waziristan and Kurram Agencies received a greater allocation than Bajaur Agency. Table XIV.1 shows the FATA-DC, Planning and Development and MNA/Senators allocations. Table IV.2 shows sectorwise allocations for all Tribal Agencies from 1971 to 1993. In 1974-75, schemes were started in agriculture, communications, health, education, housing and the irrigation sectors. After that, schemes were gradually initiated in the power, industry and rural development sectors. The initial investment of 25 million rupees in 1974-75 peaked at 115 million rupees in 1988-89 and then dropped off to 77 million rupees in 1992-93.

Figure XIV.1 shows allocation trends over time. Figure XIV.2 shows allocations by sector from 1975 to 1993. The analysis of all sectors shows that in the infrastructure development sectors, power and communications, allocations generally increased. In the basic human needs categories, such as education, health and potable water, allocations were variable from a low base. In the irrigation sector, allocations increased five times in 7 years but again dropped to the 1974-75 level in 1988-89 but increased to 6.72 million rupees in 1992-93. In agriculture and rural development, allocations have been constant despite inflation.

In the water sector (irrigation), Bajaur Agency is fourth among all Tribal Agencies in terms of allocations. The irrigation sector's share of the total allocations from 1974-75 to 1992-93 has ranged from 2 percent to 47 percent. Out of 17 years of allocations, during 3 years of this period, irrigation development received around 40 percent of the total allocation for each year. This shows that irrigation system development was a priority of the Government until 1981-82, but became less important thereafter.

Bajaur has received the largest investment in agriculcure compared to the other Tribal Agencies. However, in terms of percentage of the annual investment allocation, agriculture generally received less then 10 percent of the total allocation.

In Bajaur Agency, allocations for the agriculture extension component were in the range of 350 thousand rupees to 1.681 million rupees from 1985-86 to 1992-93. In comparison to the huge investment in irrigation a comparatively lesser amount is being spent on agriculture extension. The animal husbandry component of agricultural investment received in the range of 0.650 to 2.219 million rupees from 1985-86 to 1992-93. Given the vast agricultural potential in Bajaur, the agriculture extension component may need more funds. Forestry allocations were included in agriculture allocations in the ADP until 1987-88. The forestry sector allocations rase to 7.189 million rupees in 1992-93 by constituting 9 percent of total yearly allocations. Forestry has also become a priority of the government.

In the power sector, Bajaur Agency allocations stand in fourth position when compared to other Tribal Agencies. Electrification in the Agency started in 1975-76 with only 0.6 million rupees. The following year, this allocation rose four times. From 1976-77 onwards, the allocation kept increasing gradually until it reached 17.064 million rupees in 1991-92. The share of the power sector in the total Agency allocations was 2 percent when this sector was initiated in 1975-76. For the last 18 years, the share of the power sector in the total Agency allocations ranged from 2 percent to 23 percent. Allocations in the power sector are rising with the passage of time, indicating the construction of more grids and the extension of transmission lines.

In communications, Bajaur Agency ranks fifth when compared to other Tribal Agencies. Investment in this sector was initiated in 1974-75 with 10.190 million rupees. This amount increased to 12.360 million rupees in 1975-76. After that, the communication allocation kept decreasing until it reached only 2.86 million rupees in 1980-81. In 1981-82, the allocations rose to 8.76 million rupees and to 13.186 million rupees in 1982-83. In 1983-84 the allocations of 9.545 million rupees rose gradually to 18.675 million rupees in 1992-93. The percentage of the

communications sector's share of total Agency allocations ranged from a minimum 7 percent to a maximum 41 percent. This shows that in terms of percentage share as well as rupee amount, the Government invested heavily in the construction of roads.

Total health allocations in Bajaur Agency rank sixth among all Tribal Agencies. In the health sector, total allocations in 1974-75 were 2.37 million rupees. This amount kept decreasing until 1980-81, when it was 2.5 million rupees. From 1984-85, the allocations rose from 3.711 million rupees to 7.654 million rupees in 1990-91 and again dropped to Rs. 5.6 million rupees in 1992-93. From 1974-75 to 1992-93, the percentage of the health sector's share of the total Agency allocations ranged from 1 to 11 percent.

Investment in education in Bajaur Agency was in fourth position when compared to the other Tribal Agencies. In 1974-75, the education sector was initiated with an allocation of 3.426 million rupees. These allocations rose to 10.067 million rupees in 1982-83. In 1988-89, education allocations were 16.152 million rupees which again dropped to 7.821 million rupees in 1992-93. The percentage allocated to education in Bajaur has ranged from a 6 percent to a 24 percent. Education averaged 14 percent over the past 19 years. However, this year the investment in education declined to only 10 percent of the government's investment in Bajaur.

With respect to potable water and housing, the investment of 3.019 million rupees in 1974-75 rose to 45.93 million rupees in 1988-89 and dropped to 18.087 million rupees in 1992-93. The share of allocations ranged from 3 percent to 40 percent. For the last several years, the investment in potable water has been less than 5 percent of the total annual investment.

With respect to the investment in rural development schemes, Bajaur Agency stands in fourth position among all Tribal Agencies. The percentage of investment in small rural development schemes through LG&RD has been in the range of 1 percent to 17 percent of the total annual Agency development allocations.

Mineral exploration development was initiated in 1988-89 with an investment of 1.2 million rupees which amounts to only 1 percent of that year's total Agency allocations. In 1992-93, allocations for mineral exploration rose to 1.710 million rupees.

Table XIV.1

FATA-DC, P&D AND MNA/SENATOR YEAR/SECTORWISE ADP ALLOCATION

Agency: BAJAUR

(in million rupees)

R/L	AGRI	POWER	COMMUNI	HEALTH	EDUCAT	PP&H	INDUS	RURDEV	P&D	WATER	FOREST	MIN-ERAL	TOTAL
5	1.218		10.190	2.371	3.426	3.019				4.513			24.737
6	2.487	0.600	12.360	1.078	3.179	4.635				7.471			31.810
7	1.931	2.500	7.929	0.325	3.529	6.764				2.430			25.408
8	1.108	3.000	5.883	0.056	3.958	2.132				0.286			16.423
9	2.397	3.046	6.905	1.616	3.447	3.481	5.400	0.612		16.895			43.799
0	2.666	3.454	5.752	1.676	2.404	4.129	6.100			10.000			36.181
1	2.302	2.860	2.967	2.502	2.243	4.026	4.000			18.770			39.670
2	1.625	4.000	8.740	1.738	5.907	2.971	0.400	1.286		20.450			47.117
3	1.168	4.000	13.186	1.978	10.067	1.398	2.547	1.384		5.847			41.575
4	2.518	5.520	9.545	1.960	5.644	0.706	1.433	1.728					29.054
5	4.572	6.712	17.402	3.711	7.703	5.620	4.020	1.898					51.638
6	7.150	3.000	13.132	3.641	6.584	7.853	0.532	1.527	3.333	2.137			48.889
7	6.461	6.350	20.562	5.990	11.097	7.909	0.720	1.527	3.333	6.092			70.041
8	5.642	11.187	19.197	5.985	15.417	7.587	0.705	1.608	3.334	5.086			75.748
9	1.916	14.471	20.576	6.533	16.152	45.931	0.637	0.900		4.993	2.066	1.200	115.375
0	3.081	16.985	18.388	7.438	8.916	6.879	0.637	0.990		6.625	3.114	0.400	73.453
1	1.264	1.[illegible]5	15.854	7.654	10.806	10.680		1.089		7.146	4.337	0.295	72.840
2	1.840	17.064	15.238	6.000	11.233	12.101		1.381		8.390	4.010		77.257
3	1.648	7.730	18.675	5.600	7.821	18.087		1.519		6.719	7.189	1.710	76.698
AL	52.994	126.194	242.481	67.852	139.533	155.908	27.131	17.449	10.000	133.850	20.716	3.605	997.713

Table XIV

Sector wise allocation for all Tribal Agencies from 1971–1993 (in million rupees)

y	AGRI	POWER	OMMUN	HEALTH	EDUCAT	PP&H	INDUS	RURDE	P&D	WATER	FOREST	MINERAL	TOTAL
	52.994	126.194	242.481	67.852	139.533	155.908	27.131	17.449	10.000	133.850	20.716	3.605	997.713
r	31.699	119.763	178.817	77.781	148.365	145.173	37.590	17.612	0.589	119.432	19.206	2.590	898.617
and	25.154	99.960	199.745	50.240	127.338	109.672	9.846	15.036	9.329	59.430	16.690	1.438	723.878
ai	27.164	146.011	276.118	79.563	151.436	142.787	0.090	17.662	9.968	73.912	23.912	5.777	954.400
m	56.421	122.471	326.403	83.672	186.038	139.267	14.592	29.526	9.996	237.971	20.069	9.154	1235.580
z	32.202	108.431	280.597	70.807	125.065	146.033	29.818	14.229	10.000	198.720	13.017	26.673	1055.592
z	23.340	137.465	332.984	89.606	154.437	129.220	24.983	16.873	5.849	229.080	17.613	0.000	1161.450

FATA–DC, P&D & MNA/SENATOR PROGRAM

ADP ALLOCATION in BAJAUR 1971–1993

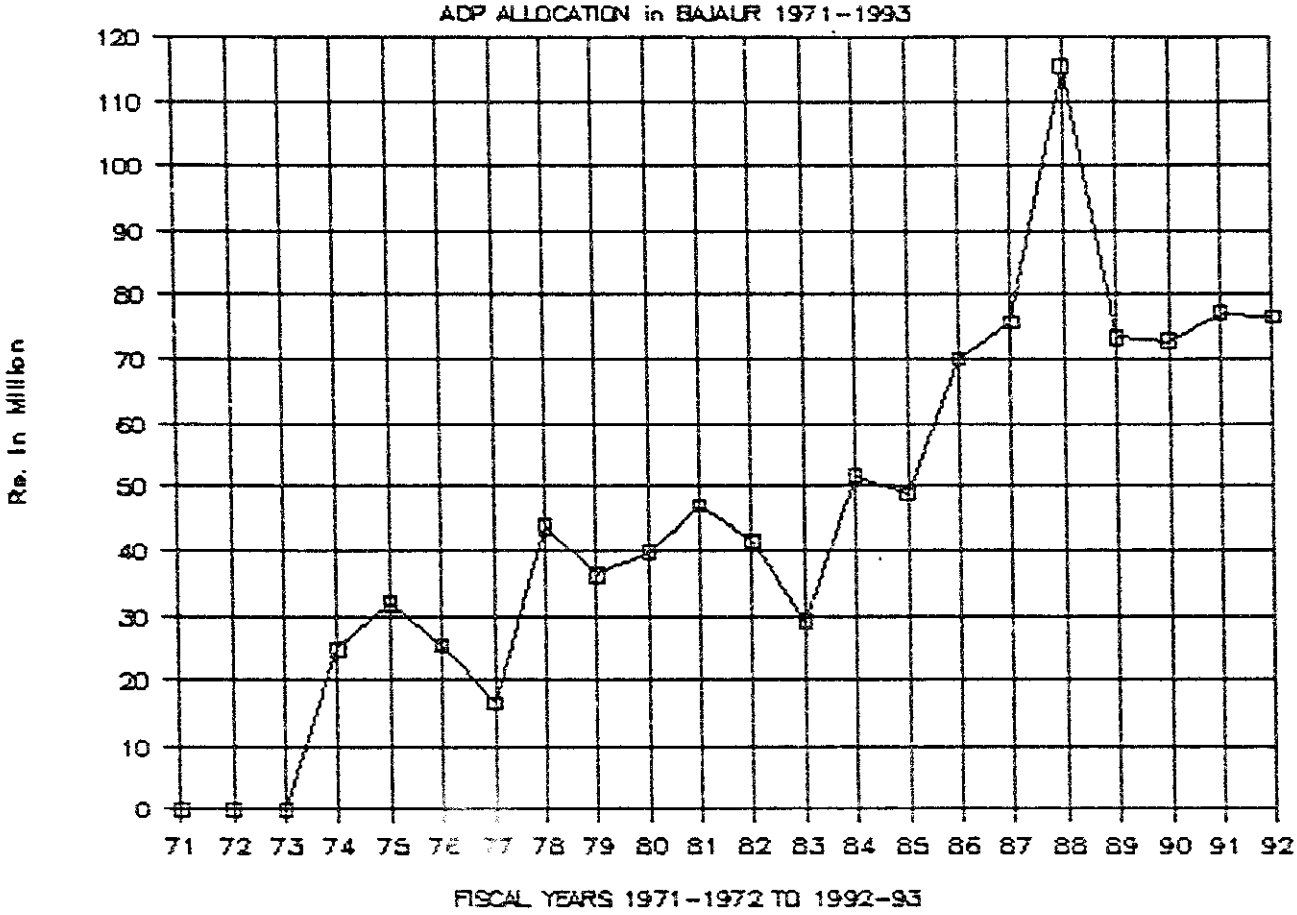
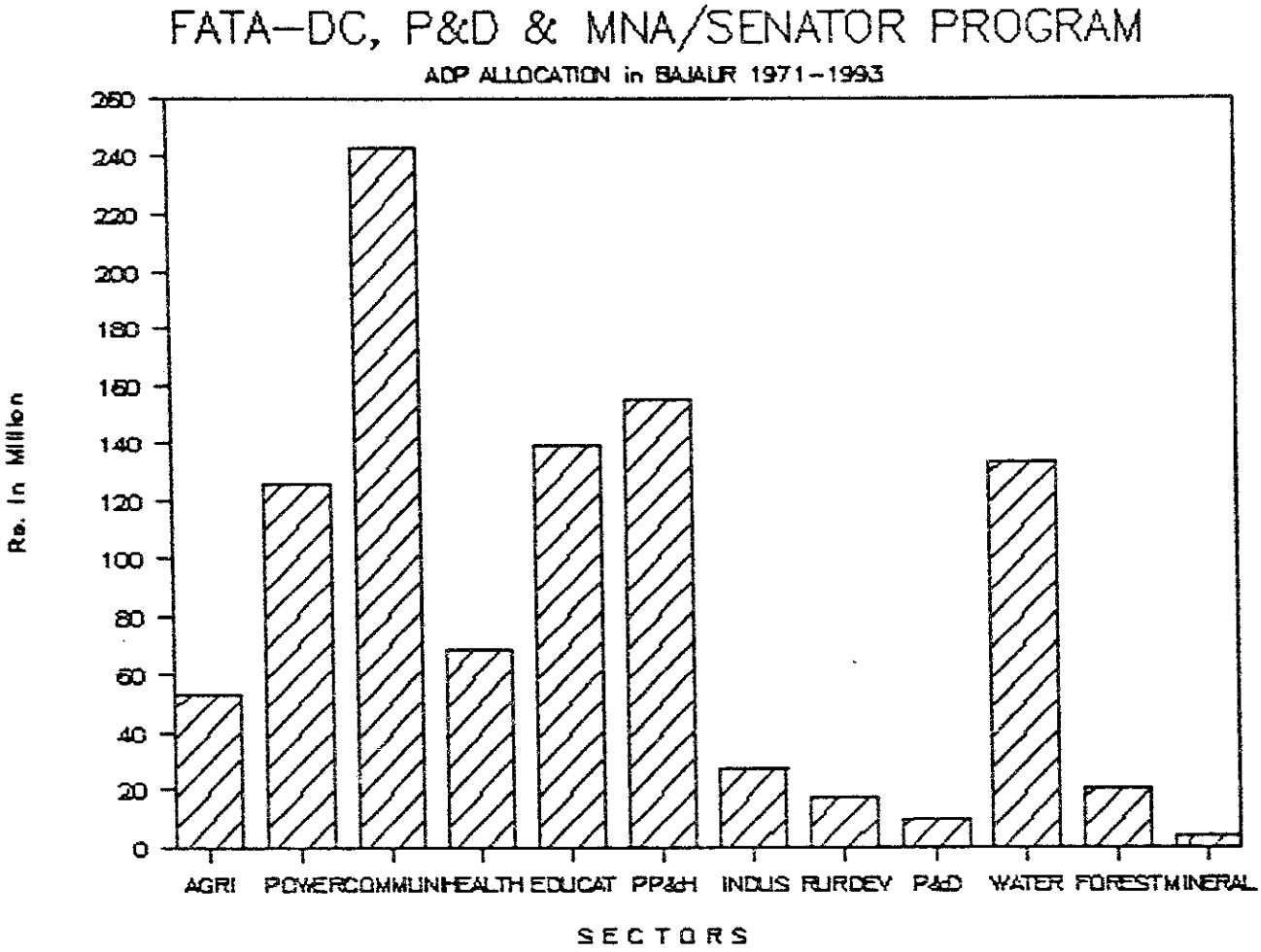


Fig.xiv.2


FATA—DC, P&D & MNA/SENATOR PROGRAM
ADP ALLOCATION in BAJAUR 1971-1993
Rs. In Million
260
240
220
200
180
160
140
120
100
80
60
40
20
0
AGRI
POWER
COMMUN
HEALTH
EDUCAT
PP&H
INDUS
RURDEV
P&D
WATER
FOREST
MINERAL
SECTORS

A P P E N D I X - 1

ANNOTATED BIBLIOGRAPHY FOR THE SOCIO-ECONOMIC PROFILE*

SECTIONS	SOURCES OF INFORMATION	COMMENTS ON ACCURACY
Geography	1. Directorate of FATA Agriculture 2. Metrological Dept. Govt. of Pakistan 3. Geology Section, FATA-DC	This information is generally accurate because climate, rainfall data and geographical features are based on scientific observations.
Administration Economy	1. Office of Political Agent 2. General public	Accurate information about administration. General observations of local area experts are roughly accurate.
	3. The Economic Impact of Afghan Refugees on the Tribal Areas by Richard English Year,	This study provided empirical data on the number of local & Afghan refugee shops in various markets. This is accurate as based on actual investigations.
Population	1981 Population Census	Population Census figures are mostly controversial because of political, methodological and inaccessibility issues.
Refugees	Commissionarate of Afghan Refugees	These figures are generally accurate and are based on actual registration of refugees.
Land use and Agriculture	1. Agriculture Statistics of NWFP 2. Pakistan Census of Agriculture, 1972 3. Directorate of FATA Agriculture	Estimates given in each source are different from others and are not accurate.
Irrigation, Flood Protection and Potable water	1. FATA-DC 2. Local Government and Rural Development	These statistics relating to schemes are accurate because these are based on factual positions in the field, but beneficiary and acreage covered estimates are doubtful.

SECTIONS	SOURCES OF INFORMATION	COMMENTS ON ACCURACY
Animal Husbandry	1. Pakistan Census of Live Stock, 1986 2. Live Stock Dept. Govt. of NWFP	Animal count statistics are not accurate because of inaccessible areas. This information is more reliable than Census data.
Forestry	Forestry Department, Govt. of NWFP	These statistics are based on facts and are generally accurate.
Communications	Communication and Works Department, Govt. of NWFP	These statistics are accurate.
Education	Education Department, Govt. of NWFP	Enrollment figures are not very accurate because various sources give different figures.
Health	Health Department, Govt. of NWFP	The number of patients treated is generally not accurate.
Electrification	Water and Power Development Authority	These are generally accurate as they are based on recorded facts.
Investment and Development	1. Investment Report, FATA-DC 2. P&D, FATA Section	These figures show actual allocations and are correct.

* The annotations are based on the sources listed, or interviews and unpublished documents provided by source officials.

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