of snow in the winter season in most places and frost is common in the whole area.

Buner Region

The climate in this region varies from dry of sub-humid to sub-tropical continental. Rainfall is received both in the summer and winter seasons. The snow seldom falls but in high land more than 1,400 m altitude. Below 1,800 m, the snow does not stay long and melts away rapidly except in cool northern parts and in sheltered places where it melts away completely by the end of April. Frost is common in the whole area in December and January.

### 3.1.5. Rivers and Water Resources

#### 1) Types and Use of Water Resources

The types of water resources used in the Project Area are i) river flows, ii) springs and iii) groundwater, and the use is classified as follows;

- Urban water supply including cottage industry
- Rural potable and domestic use
- Irrigation water for agricultural production
- Hydel power plant
- Fresh water fishery and forest nursery
- Power for water mills
- Tourism and other use

#### 2) Present Utilization of Water Resources

a) River Flow

The river flow is used most widely and largely as the water sources of three types of the resources mentioned above. The situation of the watersheds in the three Sub-Divisions are as follows.

Swat Sub-Division

This Sub-Division lies about 130 km long from north to south, about 40 km wide from west to east in the Swat river basin and covers about 5,100 sq.km. The Swat river flows down the central part of the Sub-Division from north to south collecting the water from seven main tributaries. The water is used for irrigation and rural domestic use as follows.

- The Fatehpur and Nipki Khel large scale national irrigation schemes with new stable head regulators at Patai and Banda, respectively,
- Many civil and private canals with conventional intakes which can not take the water to meet the fluctuation of river flow and have been damaged by every flood,
- Small hydel power plant with 200 Kw capacity at the Ushu river in Kalam,
- Amandara hydel power plant and national irrigation schemes located downstream from the Project Area, and
- Newly commenced Ushuran irrigation scheme.

The yearly utilization of the Swat river water in this Sub-Division is roughly estimated as shown below;

- Average annual discharge at Chakdarra (observed by WAPDA, 1961-1969) ; 5,300 MCM
- Intake of irrigation water in Swat Sub-Division (estimated with present land use) ; 1,200 MCM
- Return flow of above irrigation water ; 200 MCM
- Water right of Amandara hydel power plant and irrigation water in downstream area ; 1,000 MCM
- Therefore, annual water still flowing down without use estimated conservatively ; 3,300 MCM

However, it is not easy to use this water unless providing the reservoir with large storage capacity in order to moderate the seasonal fluctuation of discharge caused by Rabi winter rainfall and Kharif monsoon rainfall.

Shangla Par Sub-Division

This Sub-Division is composed of two watersheds called Khan Khwar basin and Itai Khwar basin, and bordered at west by Swat Sub-Division at the watershed boundary and reaches the Indus river at the east border. It is a watershed of about 1,400 sq.km extending about 50 km from north to south and about 25 km from east to west.

The Khan Khwar river basin covers a northern half of the Shangla Par Sub-Division and the river run toward east to join the Indus river. The river water is used as much as possible by means of traditional intake and conveyance method complying with the life mode and land use in the mountain villages. However, it seems to be quite difficult to introduce the large scale irrigation network or modern water facilities taking into account the mountainous lay of land and the present situation of the local peopel's livings.

On the other hand, the Itai Khwar river is well used for small scale irrigation but still have a potentiality for the water resource of irrigation and micro hydel power works.

The river water is used as below at present.

- 200 KW small hydel power plant at Karora and 100 KW at Damori in the Khan Khwar,
- Many civil and private canals for small scale irrigation works and domestic water use in the Itai Khwar, and
- A power for a lot of water mills in both the rivers.

But, the spring water is used for drinking by village people rather than river water.

Buner Sub-Division

This Sub-Division is bordered at the north-west and north by Swat and Shangla Par Sub-Divisions respectively at the watershed boundaries, and reaches the Indus river and the administrative boundary

with the Mardan Division at the east and south borders, respectively. It extends 45 km in both the directions from north to south and from east to west. The area covers about 1,760 sq.km.

This Sub-Division is clearly divided into three water basins called Baraudu (northern part), Chamla (central part) and Badri (southern part). The areal rates are about 60, 18 and 22 percents respectively in the above mentioned order.

Buner Sub-Division is located in the south and less rainy area even though there are more wider plains compared with the other two Sub-Divisions. However, there is one tributary called Budar Khwar running down from north to south through Chagarzai area and flowing into the Barandu river near Budar village. This is a perennial Nallah having comparatively large discharge even in dry season. It is promising object of reservoir construction plan.

b) Springs

There exist many springs available throughout the year at the mountain foot or valleys in the Project Area. Many of springs are traditionally used for private small scale irrigation water as well as the domestic water including potable water in the mountainous area.

Every spring belonging to individual inhabitant yields outflow in small amount, almost of which is fully and exclusively used by owners or water right holders. And hence, there is no room to develop new springs as water sources in this kind excepting improvement of equipment for effective and economical use of water available at present.

c) Groundwater

There extend many alluvial plains and terraces in the Project Area, and groundwater table is observed relatively high throughout the year. The groundwater originates in Kharif monsoon rain water and thaw in spring. Recently there have been many tube-wells founded besides the traditional drug-wells in the area.

The groundwater is used at present as the source of the following;

- Municipal water supply in Mingora, Saidu Sharif and other populated towns with the installation of tube-wells and pipe distribution systems.
- Lift irrigation schemes in Buner Sub-Divisions.

Since the utilization of the surface water resources is limited in the plain in Buner Sub-Division, some groundwater development schemes have been realized and the similar schemes are now planned.

The potentiality of the groundwater development is quite high in taking into account the high exploitability because of hydrogeological, topographical and meteorological conditions in the Project Area. However, the cost problem can be conquered.

## 3.2. Socio-Economy and Administrative Condition

### 3.2.1. Socio-Economic Condition

#### 1) Land Resources

The total Project Area for the Integrated Rural Development Project is 878,840 ha, of which the farmland occupies about 22 percent, the cultivable waste about 2 percent, the pasture land and grazing land about 27 percent, the forest about 24 percent, and the non-cultivable area (not available for cultivation) 25 percent as shown in the Table 3-2.

Among the cultivated area of 196 thousand hectare in total, the rainfed (Barani) farmland amounts for some 75 percent or 147 thousand hectare and irrigated area forms 25 percent or 49 thousand hectare. While, Barani area occupies 92 percent or 38 thousand hectare of the total cultivated area in Shangla Par Sub-Division.

The forest land occupies 24 percent or 213 thousand hectare of the total land in the Project Area. The pasture land and grazing land occupy largest share in the total area. Those areas are used only for the pasture and grazing land in rainy seasons because the areas are located in the steep south slope and receive strong sunshine so that the effective use may not be easy.

#### 2) Population

According to the 1981 Census, the total population in Pakistan was about 84,253 thousand with the density of 106 persons per square kilometer. In the NWFP it was 11,061 thousand with 148 persons per square kilometer. While the population in Swat District was 1,233 thousand with 140 persons per square kilometer.

The annual rates of increase in population in a decade from 1972 to 1981 are 3.1 percent in the whole Pakistan, 3.3 percent in NWFP and 3.7 percent in Swat District as shown in the following table;

Population Movement in the Project Area

| Item | Swat | NWFP | Pakistan |
|---|---|---|---|
| Area (sq.km) | 8,780 | 74,521 | 796,095 |
| Population | | | |
| - Population, 1961 | 589,604 | 5,730,991 | 42,880,378 |
| - Annual Increase (%) | 3.5 | 3.3 | 3.9 |
| - Population, 1972 | 888,411 | 8,388,551 | 65,309,340 |
| - Annual Increase (%) | 3.7 | 3.3 | 3.1 |
| - Population, 1981 | 1,233,001 | 11,061,328 | 84,253,644 |
| Household | | | |
| - Total Household | 184,030 | 1,626,666 | 12,575,170 |
| - Annual Increase | | | |
| Family Member/Household | 6.7 | 6.8 | 6.7 |

Source: Population Census Organization Government of Pakistan, Islamabad.

The present population (1988) in Swat District is estimated at 1,537 thousand in assuming that the rate of the natural growth is 3.2 percent.

The number of households is about 12,575 thousand in whole Pakistan, 1,627 thousand in NWFP and 184 thousand in Swat District, which were estimated from 6.7, 6.8 and 6.7 persons of the average unit family member, respectively. The total households as of 1988 is estimated at about 229 thousand numbers based on 3.2 percent of the growth rate and 6.7 persons of the unit family member.

3) Situation of Agricultural Production in Swat District

The share of main cropping areas in Swat District shows the high ranking among 13 Districts in NWFP as shown below;

Ranking of Cropped Acreage of Main Crop
(1986/1987, Swat District)

| Item | Wheat | Maize | Fruits | Oil Seed | Sugarcane |
|---|---|---|---|---|---|
| Area (1,000 ha) | 104.9 | 98.3 | 5.3 | 3.1 | 2.4 |
| Ranking in 13 Districts of NWFP | No.1 | No.1 | No.1 | No.3 | No.5 |

Source: Important District Wise Socio-Economic Indicators NWFP 1988, Bureau of Statistics.

Sub-Division-wise gross production value (GPV) of main crop is roughly estimated as shown in the following table:

Gross Production Value of Crop (1986/1987)

(unit: million Rupee)

| Sub-Division | GPV in 1983/1984 | GPV in 1986/1987 | Wheat | Maize | Fruit | Rice | Potato |
|---|---|---|---|---|---|---|---|
| Swat | 1,512 | 1,785 | 140 | 141 | 905 | 185 | 245 |
| Shangla Par | 175 | 209 | 49 | 142 | 14 | 16 | - |
| Buner | 262 | 320 | 111 | 153 | 2 | 3 | - |
| Total | 1,949 | 2,314 | 300 | 436 | 921 | 204 | 245 |

Note: 1. : The cropping area is in accordance with Agricultural Statistics Office, Agricultural Department, Swat.

2. : The farm gate prices by crops are tentatively estimated at 90 percent of average wholesale price at Mingora Central Market of fruits and vegetable in 1978/1988.

The Sub-Division-wise differences in agricultural production are found in Swat District. The situation in both Shangla Par and Buner Sub-Divisions is much lower than that in Swat-Division in view of the level of economy and food production.

4) Landholding System

According to the 1980 Agricultural Census, all agricultural households were about 142 thousand, of which the ordinary farm households were 110 thousand and the livestock holders were 32 thousand. For the others, the permanent hired workers were reported by 4 thousand which corresponds to landless agricultural workers. The farm households of about 110 thousand include owners by 72.2 percent, owner-cum-tenants by 8.6 percent and tenants by 19.2 percent, respectively. The number of agricultural households, livestock holders, and landless agricultural workers in 1988 are estimated at 140 thousand households, 41 thousand households and 36 thousand households, respectively, applying an annual increase rate of 3.2 percent.

The average farmland holding is 1.53 ha (3.77 acres) by owner, 2.00 ha (4.96 acres) by owner-cum-tenant, 1.16 ha (2.86 acres) by tenant, and 1.50 ha (3.70 acres) by total farmer.

### 3.2.2. Regional Industry

The study on industrial structure of Swat District was made through the estimation of distribution rate of employees by industries as shown in the following table. The rural and urban areas show their own structures.

Distribution Ratio of Employment Population by Industry Sector, 1981

(unit: %)

| Sector | Rural Area | | | Urban Area | | |
|---|---|---|---|---|---|---|
| | Swat | NWFP | Pakistan | Swat | NWFP | Pakistan |
| 1. The Primary Industry | (82.1) | (71.0) | (68.8) | (7.5) | (7.6) | (7.4) |
| - Agriculture, Forest, Fishery | 82.1 | 71.0 | 68.8 | 7.5 | 7.6 | 7.4 |
| 2. The Secondary Industry | (3.9) | (6.8) | (10.1) | (18.1) | (14.7) | (16.2) |
| - Mining | 0.3 | 0.3 | 0.4 | 0.3 | 0.1 | 0.3 |
| - Manufacturing | 1.7 | 2.4 | 5.9 | 5.9 | 6.4 | 18.3 |
| -Electricity, Gas, Water | 0.2 | 0.7 | 0.4 | 0.8 | 1.4 | 1.2 |
| - Construction | 1.7 | 3.4 | 3.4 | 11.1 | 6.8 | 6.4 |
| 3. The Tertiary Industry | (12.4) | (18.6) | (17.0) | (72.0) | (71.0) | (59.0) |
| - Wholesale, Retail, Restaurants, Hotel | 3.3 | 5.3 | 5.0 | 26.9 | 21.6 | 21.8 |
| - Transport, Storage, Communication | 1.4 | 2.9 | 2.5 | 17.5 | 9.2 | 8.6 |
| - Finance, Insurance | 0.3 | 0.3 | 0.3 | 1.6 | 1.9 | 2.1 |
| - Community, Social & Personal Services | 7.4 | 10.1 | 9.2 | 26.0 | 38.2 | 26.5 |
| 4. Not Adequately Defined | (1.6) | (3.6) | (4.1) | (2.4) | (6.7) | (7.4) |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Source: Population Census, 1981

As regards the industrial structure in the rural area, the distribution rate of employed population in the primary industry, that is, 82.1 percent, is about 10 percent higher than those in NWFP or Pakistan. The secondary industry sector and the tertiary industry sector are 3.9 percent and 12.4 percent, respectively. These rates are three to six percent and six to 11 percent higher than those in NWFP and Pakistan, respectively. The low growth of the secondary industry sector is due to low investment to roads, electricity and water supply, unfavorable local

conditions for factory sites in the rural and mountainous area with poor transportation, and limited opportunity for local investment.

Those of the urban area are represented by Mingora City. All the employee rates in the secondary industry in the urban areas are not always low as compared to those in NWFP and Pakistan. Especially, the rate of the employed in the sub-sector of construction in Swat District is higher than those in NWFP and Pakistan. The rate of employment population in the tertiary industry is much higher than those in NWFP and Pakistan. The high rate is owing to the high rate in wholesales, retailers, and restaurants & hotels as sub-sectors and the transport, storage and communication sub-sectors. These sub-sectors have been expanded through development of tourism resources in Swat District. In the rural area, the distribution rate of employees in commerce as wholesale, retail, and restaurants & hotels is as low as 3.3 percent. The number of shops is 12,200, and Swat Sub-Division occupies about 70 percent, Shangla Par 16 percent and Buner 14 percent, respectively.

When the purchasing power of the farmers for consumer goods is increased through farm income increase in the future, the rate of employed population or shops by Sub-Division as mentioned above will be changed.

In 1981, the employee by manufacturing sector was about 5,000 persons in the rural area and 1,000 persons in the urban area for the total working population of about 324,000 persons. The manufactured products are silk yarn, textile/woolen products, furniture, milled rice, flour, bakers, etc.

### 3.2.3. Administration and Rural Development Organization

The general administration in Swat District is executed through such organs as Sub-Division, Tehsil, Sub-Tehsil and village. And there are 3 Sub-Divisions, 5 Tehsils, 14 Sub-Tehsils and 1,695 villages in the area. The villages are categorized into Mauza, Deh and Hamlet according to the density of inhabitants. The responsible persons as the administrative heads in Swat District, three Sub-Divisions and Tehsils are Deputy Commissioner, Assistant Commissioners and Tehsildars, respectively.

The names of Sub-Divisions, Tehsils and Sub-Tehsils are shown as follows;

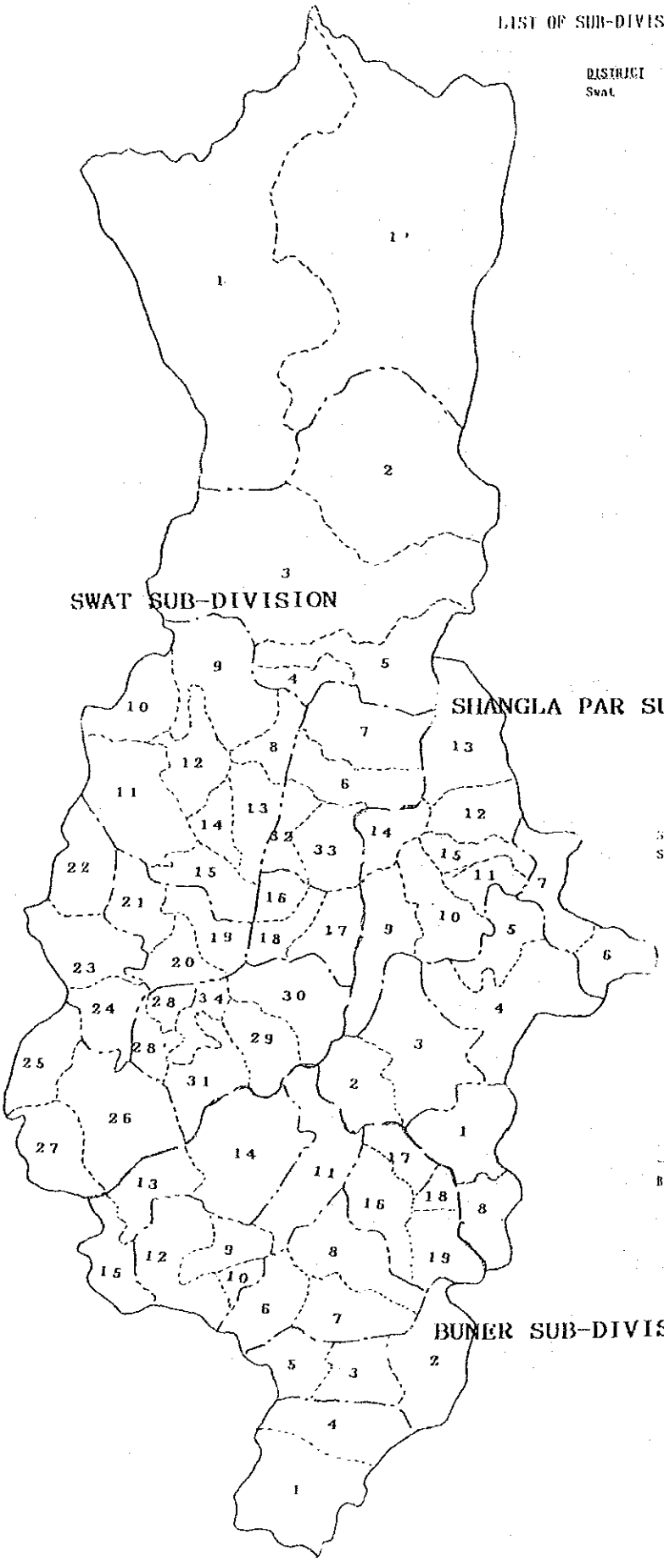
| Sub-Division | Tehsil | Sub-Tehsil |
|---|---|---|
| Swat | Bahrain | Barikot, Kabal, Charbargh |
| | Matta | Khawazakhela, Kalam |
| Shangla Par | Alpuri | Puran, Martung, Chakesar, Besham |
| Buner | Daggar | Gadezai, Gaggra, Chagharzai, Chamla, Totalai |

Note: Administrative boundary in Swat District is shown in Figure 3-4.

The government authorities and others concerned with the Master Plan Study for Swat District Integrated Rural Development Project are as follows;

1) Federal Government of Pakistan:
   - Economic Affairs Division
2) Government of NWFP
   - Local Government & Rural Development (LG & RD) Department
   - Planning & Development Department
   - Food, Agriculture, Livestock & Dairy Development and Cooperative Department,
   - Irrigation Department
   - Forestry, Wildlife and Fishery Department
   - WAPDA
   - Communication and Works Department
   - Education Department
3) University, Institute and Other Authorities in Peshawar
   - Institute of Development Studies, Agricultural University, Peshawar
   - Pakistan Forest Institute, Peshawar
   - Fruit and Vegetable Board
   - Soil Survey of Pakistan, Peshawar Field Office

# FIGURE 3-4 ADMINISTRATION BOUNDARY IN SWAT DISTRICT




LIST OF SUB-DIVISION WISED TEHSIL, SUB-TEHSIL AND UNION COUNCIL

| DISTRICT | SUB-DIVISION | ZONE | TEHSIL/ SUB-TEHSIL | UNION COUNCIL |
|---|---|---|---|---|
| Swat | Swat Sub-Div. | I | Kalam | 1 Utror |
| | | | | 1' Kalam |
| | | | Bahrain | 2 Balakot |
| | | | | 3 Bahrain |
| | | | | 4 Madyan |
| | | | | 5 Chail Shahgram |
| | | II | Matta | 8 Mohammad Khel |
| | | | | 9 Merokhel |
| | | | | 10 Sinakhel |
| | | | | 11 Behlolkhel Matta |
| | | | | 12 Mullahkhel No 2 |
| | | | | 13 Hassan Khel |
| | | | | 14 Mullahkhel No 1 |
| | | | | 15 Nazar Khel |
| | | | Khawazakhela | 6 Fatehpur |
| | | | | 7 Barhampattai |
| | | | | 32 Khadukhel |
| | | | | 33 Barakhel Marli Khel |
| | | | Charbagh | 16 Gulibagh |
| | | | | 17 Malam Jabba |
| | | | | 18 Charbagh |
| | | III | Kanju | 19 Bar Attia Mingolai |
| | | | | 20 Kuz Attia Mingolai |
| | | | | 21 Sahibkhel |
| | | | kabal | 22 Shah Dherai |
| | | | | 23 Totano Bandai |
| | | | | 24 Abakhel Kabal |
| | | | Barikot | 25 Shamozai |
| | | | | 26 Abakhel Baricot |
| | | | | 27 Musakhel Kota |
| | | | Mingora | 28 Abakhel Qasbar |
| | | | | 28' Barath Khel Odigram |
| | | | | 29 Kokarai |
| | | | | 30 Akasaro Bamikjel |
| | | | | 31 Islampur |
| | | | | (34 Mingora/Saidu Sharif) |
| Shangla Par Sub-Div. | | IV | Alpuri | 9 Bar Ghurband |
| | | | | 10 Kuz Ghurband |
| | | | | 11 Kuzkana |
| | | | | 12 Berkana |
| | | | | 13 Pirkana |
| | | | | 14 Lilonai |
| | | | | 15 Shahpur |
| | | V | Chakesar | 4 Kur Pan Chakesar |
| | | | | 5 Bar Pan Chakesar |
| | | | Puran | 2 Makhozai |
| | | | | 3 Puran |
| | | | Martung | 1 Martung |
| | | | | 8 Behlol Khel |
| | | VI | Besham | 6 Dandai |
| | | | | 7 Besham |
| Buner Sub-Div. | | VII | Daggar | 9 Etai |
| | | | | 10 Karapa |
| | | | | 11 Daggar |
| | | | | 12 Torvarsak |
| | | | Gadezai | 13 Malaikhel |
| | | | | 14 Gadezai |
| | | | | 15 Abakhel Salarzi |
| | | | Gagra | 6 Norezai |
| | | | | 7 Bajkata |
| | | | | 8 Gagra |
| | | | Chagharzai | 16 Batara |
| | | | | 17 Gul Bandai |
| | | | | 18 Sorai |
| | | | | 19 Dandir |
| | | VIII | Chamla/ Amazai | 2 Amazai |
| | | | | 3 Navagai |
| | | | | 5 Chamla |
| | | IX | Khudukhel | 1 Totalai |
| | | | | 4 Khudukhel |

4) Local Government of Swat District

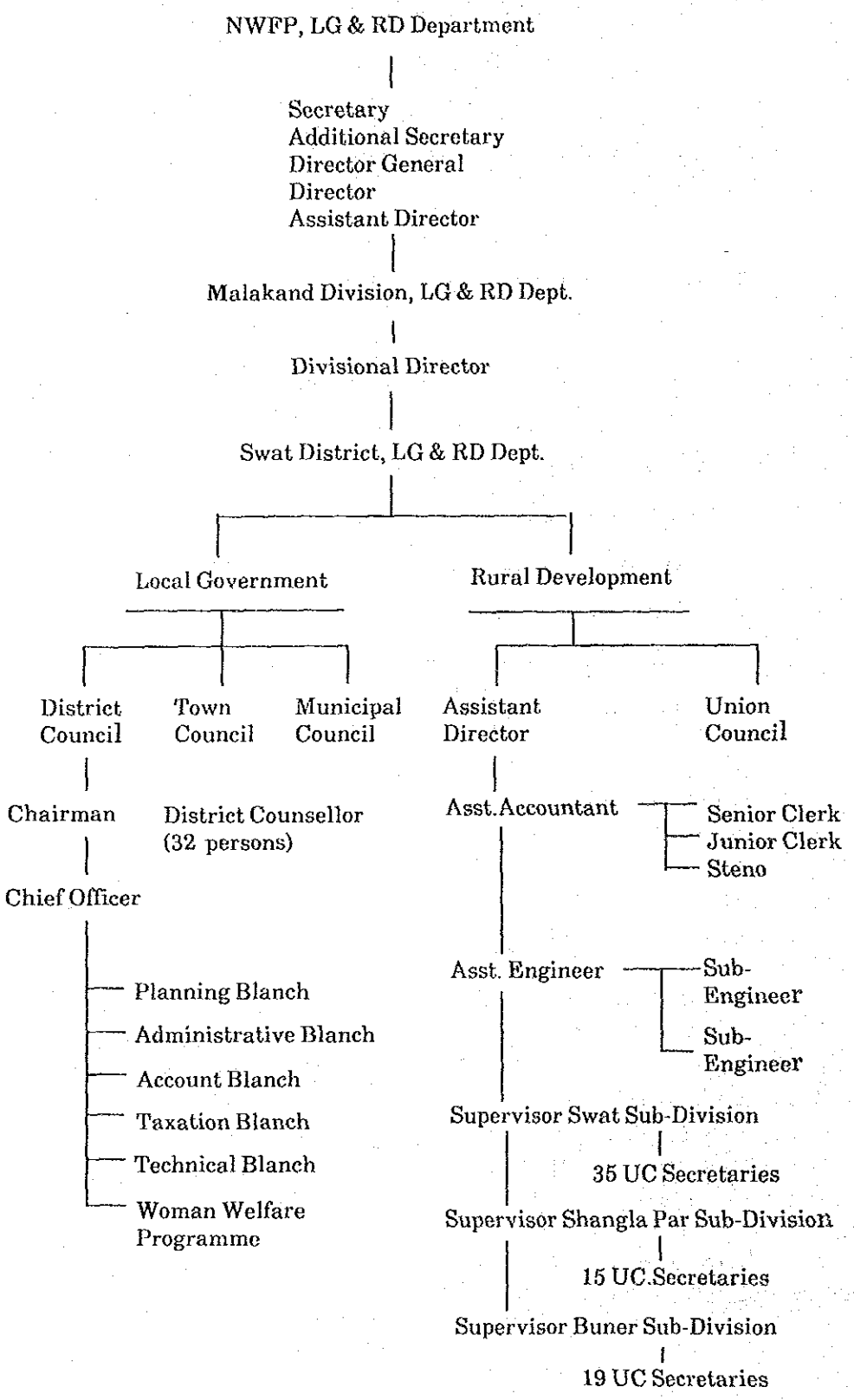
- Services & General Administrative Department
- Local Government & Rural Development Department
- Food, Agriculture, Livestock and Dairy Development and Cooperative Department
- Irrigation Department
- Water Management Department
- WAPDA, Swat
- Forest, Wildlife and Fishery Department
- Communication and Works Department
- Public Health Engineering Department
- Health Department
- Social Welfare Department
- Education Department
- Pakistan Tourism Development Corporation
- Small Industrial Development Board

Some of the rural development works are to be carried out directly by the Government Departments including the Ministry of LG & RD, the Administration of FATA (Federary Administration Tribal Area) etc. on the federal and the local government levels and other departments/agencies on the provincial level.

Union Councils (UCs) are the self-governing organization which is based on the grass-roots level rural people. The total number of UC is 69 in Swat District where 35, 15 and 19 are located in Swat, Shangla Par and Buner Sub-Divisions, respectively. The 539 wards i.e. group of village, are set up as the administrative category between UC and terminal villages for UC to control easily the terminal villages located over a wide area.

The administrative organization of LG & RD Department in Swat District is shown in Figure 3-5.

FIGURE 3-5. ORGANIZATION OF LG & RD DEPARTMENT IN SWAT DISTRICT



The functional activities of UC are performed by the Councilors and Secretaries. The Secretaries appointed to each UC are administrative officers of LG & RD Department in Swat District. The Councilors are selected by one per thousand persons by the regular election. The activities of UC are to execute such development works as the construction of the small scale public facilities within the budget of about Rs.100,000 allocated to each UC, maintenance and repair works of public facilities, planning of development projects and the sanction of each project which may be executed by UC. The organization of UC does not employ own engineers, hence the engineers from LG & RD Department, Swat support the activities of UC. Tehsil Council and District Council exist as the upper class agencies than UC.

District Council is organized by six sections under the Chairman. The development projects founded by the local taxes are approved by the District Counselor House. The technical branch staffs survey, design and supervise such works.

On the other hand, the Provincial Governments set up District Development Committees, which the Chairmans of District Councils join to identify the locations of the development of areas and to assist in the formulation of projects by departments and to supervise the work progress.

In other way, the Provincial Coordination Committees and the Provincial Monitoring Committees are established to serve well for the implementation of the development works on the state level.

## 3.3. Agriculture

### 3.3.1. Land Holding and Land Tenure

According to 1980 Census of Agriculture, the total farm households by land tenure type in Swat District are as follows:

Farm Households by Land Tenure and Farm Size in 1980

| Item | Total | Owner | Owner-cum Tenant | Tenant |
|---|---|---|---|---|
| No. of Farm Households ('000) | 110.0 | 79.5 | 9.4 | 21.1 |
| (%) | (100.0) | (73.5) | (11.7) | (14.8) |
| Farm Size of Total Farm Area (ha) | 1.50 | 1.52 | 2.04 | 1.16 |
| Farm Size of Cultivated Area (ha) | 1.24 | 1.23 | 1.75 | 1.09 |
| - Irrigated Area | 0.38 | 0.38 | 0.54 | 0.34 |
| - Unirrigated Area | 0.86 | 0.85 | 1.21 | 0.75 |

Source: 1980 Census of Agriculture

The census data show the skewed distribution of land holding as follows (see Annex C for the detail). i) about seven percent of total farm households own 35 percent of total farm area as owner cultivators with average size of 7.2 ha, while the remaining number of cultivators are small farmers with average size of 1.1 ha. ii) about 79 percent of total farm households cultivate farmland less than two hectares. In Pakistan it is defined that the farmers with the size of farmland less than five hectare of irrigated land or 10 ha of unirrigated land are small farmers. Therefore, almost all farm households would be classified into small farmers.

The settlement works had been completed by 1986 in the District. The land settlement record is shown in 3.1.3 "Soil and Land Use".

In most cases, the tenants farmers were common before abolishing the traditional land holding system maintained in Swat State. Recently, however, many tenants have come to obtain the land holding right for their own, which are realized by earning money obtained in the foreign countries and by the land reform in the District. The land reform in 1972 resulted in releasing 540 ha of land for 586 tenants to owners in Swat Sub-Division (see Annex C).

### 3.3.2. Crop Production

#### 1) Crops and Cropping Pattern

Wheat and maize are sown in more than 50 percent of the cultivated area in Rabi and Kharif seasons as a basic food crop for the rural families and the straws and stubs are used as fodders for cattle (see Table 3-3). Rice is another important Kharif crop and grown totally under irrigation. Pulses and beans, barley, fodders and rape & mustard are sown in comparatively wide areas. Vegetables and fruits are almost exclusively grown in irrigated fields. Among vegetables, potato and onion are playing an important role in the economic uplift of the area. Tomato, spinach and turnip are other major vegetables. The most extensively planted fruit is apple followed by walnut and apricot.

The overall cropping intensity (total cropped area/total cultivated area x 100) in Swat District is 137 percent in 1986/1987, while those of irrigated and unirrigated fields are 185 and 121 percent in the same year. The higher cropping intensities with larger area coverage of cash crops like vegetables, onion, potato, fruits, etc., rice and fodders are employed in the cropping pattern applied in irrigated areas to compare with the unirrigated areas. The cropping pattern applied in irrigated areas concentrates in Swat Sub-Division, while the one applied in unirrigated area is prevailing in Shangla Par and Buner Sub-Divisions, where wheat and maize are major crops.

The rotation of main crops in the District is as follows;

- Wheat - Maize - Legume, Fodder
- Wheat - Rice - Legume, Fallow
- Wheat - Mustard (rainfed marginal land)
- Onion - Rice or Fodder

The crop calendar of major crops is shown in Figure 3-6.

TABLE 3-3 CROPPED AREA AND CROPPING INTENSITY (1986/1987)
(SWAT DISTRICT)

| Crop | Irrigated Area | | Unirrigated Area | | Total | |
|---|---|---|---|---|---|---|
| | Area (ha) | Intensity (%) | Area (ha) | Intensity (%) | Area (ha) | Intensity (%) |
| 1. Kharif Crop | 51,830 | 106.6 | 81,902 | 55.7 | 133,741 | 68.3 |
| Maize | 25,250 | 51.9 | 73,000 | 49.6 | 98,250 | 50.1 |
| Rice | 20,250 | 42.4 | | | 98,250 | 10.5 |
| Pulses | 1,265 | 2.6 | 5,880 | 4.0 | 7,154 | 3.7 |
| Potato | 2,570 | 5.3 | 410 | 0.3 | 2,980 | 1.5 |
| Vegetables | 1.670 | 3.4 | 73 | 0.0 | 1,743 | 0.9 |
| Fodders and Others | 825 | 1.7 | 2,539 | 1.8 | 3,364 | 1.6 |
| 2. Rabi Crops | 31,480 | 64.8 | 95,141 | 64.7 | 126,561 | 64.7 |
| Wheat | 20,200 | 41.5 | 84,714 | 57.6 | 104,914 | 53.6 |
| Barley | 480 | 1.0 | 4,697 | 3.2 | 5,117 | 2.6 |
| Rape and Mustard | 137 | 0.3 | 2,933 | 2.0 | 3,070 | 1.6 |
| Pulses | 132 | 0.3 | 1,507 | 1.0 | 1,639 | 0.8 |
| Onion | 1,843 | 3.8 | 75 | 0.0 | 1,918 | 1.0 |
| Vegetables | 1,112 | 2.3 | 190 | 0.1 | 1,312 | 0.7 |
| Folders and Others | 7,566 | 15.6 | 1,025 | 0.8 | 8,591 | 4.4 |
| 3. Sugarcane | 1,930 | 4.0 | 460 | 0.3 | 2,390 | 1.2 |
| 4. Fruits | 4,455 | 9.2 | 913 | 0.6 | 5,368 | 2.7 |
| Total | 89,695 | 184.4 | 178,416 | 121.3 | 268,060 | 136.9 |
| 5. Cultivated Area | 48,639 | 100.0 | 147,092 | 100.0 | 195,731 | 100.0 |

Source : Agricultural Statistical Office, Swat District

## FIGURE 3-6 PRESENT CROP CALENDAR

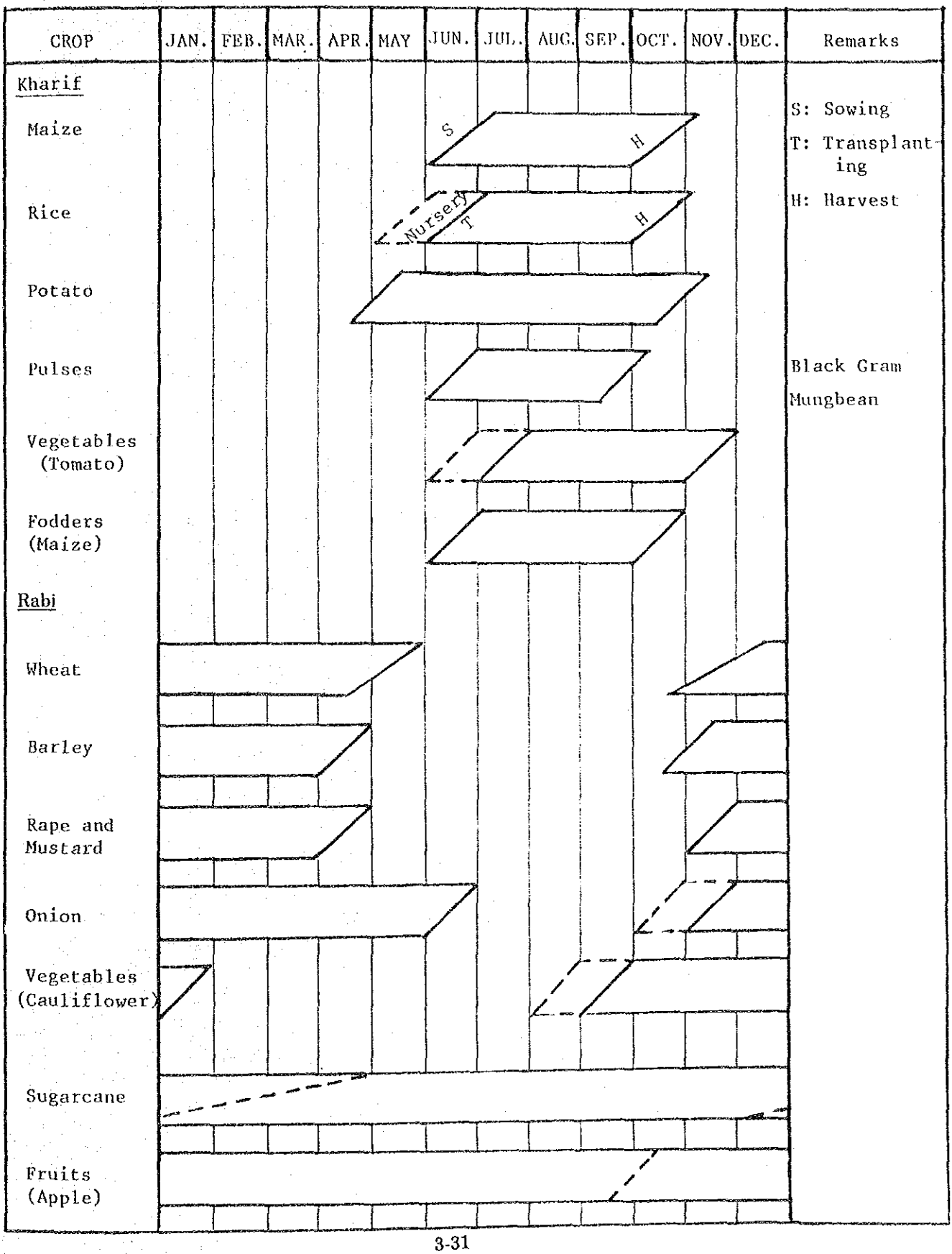


TABLE 3-4 AVERAGE CROP YIELD AND PRODUCTION FOR 5-YEARS (1983/1984-1987/1988)

| Crops | Swat Sub-Division | | Shaugla Par Sub-Division | | Buner Sub-Division | | Swat District | |
|---|---|---|---|---|---|---|---|---|
| | Yield (t/ha) | Production (1,000 t) | Yield (t/ha) | Production (1,000 t) | Yield (t/ha) | Production (1,000 t) | Yield (t/ha) | Production (1,000 t) |
| Wheat (total) | 1.25 | 46.0 | 0.84 | 15.3 | 0.86 | 33.1 | 1.01 | 94.4 |
| Wheat (Irri.) | 1.64 | 29.2 | 1.58 | 1.9 | 1.63 | 5.4 | 1.64 | 36.5 |
| Maize (Total) | 1.59 | 49.4 | 1.18 | 42.7 | 1.21 | 43.3 | 1.28 | 135.4 |
| Maize (Irri.) | 1.71 | 34.2 | 1.80 | 2.2 | 1.69 | 5.9 | 1.71 | 42.3 |
| Rice (Irri.) | 1.59 | 26.0 | 1.60 | 2.6 | 1.60 | 0.6 | 1.59 | 29.2 |
| Potato (Total) | 10.83 | 30.2 | 7.69 | 0.5 | 9.74 | 0.1 | 10.73 | 30.8 |
| Rape & Mustard (Total) | 0.38 | 0.8 | 0.42 | 0.0 | 0.37 | 0.5 | 0.38 | 1.3 |

Source: Agricultural Statistical Office, Swat District, Mingora.

2) Cultivation Practice

Cultivation practice of most small farmers in the area is the most primitive one with traditional implements or by hands. However, the modern agricultural machinery have become popular mainly among the large-scale farmers. Usually a little amount of farm manure is applied prior to field preparation which is made crosswise by tractor mounting field cultivator or an ox-drawn plow. Seeds and fertilizers are broadcasted mainly by hands. Weeding is rarely done and pest control by pesticides is generally not practiced.

The distributed amount of major fertilizers in Swat District in 1987/1988 is as follows:

| | | | |
|---|---|---|---|
| Urea | : 6,550 tons | Di-Amm. Phosphate | : 3,500 tons |
| Amm.Sulf | : 9,050 tons | Amm.Nitrate | : 1,050 tons |
| Others | : 4,900 tons | | |

Source : EADA Office, Swat

At present the rate of fertilizer application is not more than one third to one fourth of the recommended level which is 120 kg/N per hectare and 100 kg/$P_2O_5$ per hectare for both wheat and maize.

3) *Crop Production*

The average yield and production of main crops are shown in Table 3-4. The average wheat production in the District during 1983/1984 to 1987/1988 amounts to 94.4 thousand tons, which is nearly three times as much as that in 1977/1978. About 39 percent of the total wheat are produced under irrigated cultivation in Swat District of which yield is much higher than that under unirrigated.

Maize production is 135 thousand tons which also rose to more than three times as much as that in 1977/1978. Each Sub-Division has nearly the same amount of the production. More than 30 percent of the total production is under irrigated cultivation in Swat District, and the yield is considerably higher than that under non-irrigation.

All rice cultivation in the District is made in the irrigated fields. The total rice production amounts to 29.2 thousand tons, of which about 90 percent is covered by those in Swat Sub-Division.

As seen in Table 3-3, vegetables and fruits are mainly grown by irrigated cultivation. Potato and tomato are major cash crops, and are mostly produced in Swat Sub-Division, of which the cropped areas have been extended to the mountainous belts. Apple is the most extensively planted fruits in the District. As shown in the above, the production of wheat and maize in Swat District has been remarkably increased with expansion of cropped area for the last ten years. However , the yield has been raised very slightly. The yield level of other major crops in Swat District is lower than that of other national average (see Annex C).

### 3.3.3. Farm Mechanization and Input Supply

According to the 1980 Census of Agriculture, about 80 percent of the farm households used only draft animals. The remaining five and fifteen percent of farm households employ the tractor only and the combination of tractors and draft animals respectively. Though the use of tractors has become popular recently in the District, the very limited numbers of farm machinery are used in Shangla Par Sub-Division, due to poor road conditions in the prevailing hilly topography.

The meager supply of quality seeds and seedlings is one of the significant bottle necks to raise crop yield. No regular organizations or industries of seed production/distributions have not been established in the District. The agricultural cooperatives distribute the seeds and fertilizers to the member farmers, and the share to the total sold fertilizers is less than 15 percent. Then, most of the farmers are dependent upon the supply of Agricultural Development Authority (ADA) sales points, though the sales points are few to cater for farmers demand. The average amount of nitrogen off-take per one hectare of cropped area in the District is estimated at about 20 kg in both periods of 1985/1986 and 1986/1987 (see Annex C).

Since the absence of repair shops for machinery owned either by government and farmers has caused much trouble in operation, the Agricultural Engineering Department has started to provide the repair shop in the District so as to minimize the waste time by defected machinery and to ensure the smooth working. The necessary budget for workshop machinery, however, has not been allocated yet.

### 3.3.4. Animal Husbandry

#### 1) Outline of Animal Husbandry

The total population in 1988 in the District is estimated as shown in Table 3-5, based on the 1986 Census of Livestock. Buffaloes are dominant in the area at the altitude less than 1,200 m, while the share of cattle increases in the higher altitude areas. The buffaloes are not raised usually for working but for milking, and about half of the cattle (over 3 year old) are for working .The feed source is limited to the stover/straw of Kharif crops like maize, rice and the stored hays of natural grasses during Rabi season. Such fresh fodders of shaftals and others are available only in the irrigated areas.

During the field survey, the following are found as the major problems of animal husbandry.

- There is no veterinary hospital in Shangla Par Sub-Division, where almost half of total heads of cattle and buffaloes in Swat District are raised.
- Introduction of artificial insemination is only in the initial stage, where the insufficiency in the artificial insemination centers/sub-centers and poor communication/transportation facilities are prevailing.
- The extension activities are not so active especially dull in the improvement of breeding including animal nutrition.

Based on the 1986 Census of Livestock on the Migratory Herds reveals that about 4,000 herds/flocks come between the middle of April and the middle of May from lower plain areas like Mardan area and go back there between the middle of October and the middle of November. One herdsman brings mainly about 100 head of sheep and goats, and thus the total number of livestock brought by herders are estimated at about four lakh.

## TABLE 3-5 ESTIMATED LIVESTOCK POPULATION (1988)

| Animal | No. of Raising Households | | | No. of Animals ('000 head) | | | | No. of Animal per Raiser (head) |
|---|---|---|---|---|---|---|---|---|
| | Total ('000) | Farm Households ('000) | Non-Farm Households ('000) | Total | Farm Households | Non-Farm Households | Migratory Herd | |
| 1. Cattle | 146.4 | 114.7 | 31.7 | 381.5 | 312.1 | 58.4 | 11.0 | 2.8 |
| - Bull / Bullock | | | | 155.5 | 146.1 | 7.9 | 1.5 | 1.3 |
| - Cow | | | | 226.0 | 166.0 | 50.5 | 9.5 | 1.5 |
| 2. Buffaloes | 91.0 | 78.5 | 12.5 | 170.6 | 150.2 | 16.7 | 3.7 | 1.9 |
| - Bull / Bullock | | | | 8.5 | 7.3 | 1.0 | 0.2 | 0.1 |
| - Cow | | | | 162.1 | 142.9 | 15.7 | 3.5 | 1.8 |
| 3. Mules / Donkey | 19.3 | 12.1 | 17.1 | 36.1 | 18.6 | 17.4 | 1.9 | 1.5 |
| 4. Sheep | 13.6 | 10.8 | 2.8 | 108.2 | 85.7 | 22.5 | 118.7 | 7.9 |
| 5. Goats | 46.9 | 33.3 | 13.6 | 437.5 | 210.4 | 60.5 | 166.6 | 6.3 |
| 6. Paultry | 171.2 | 112.7 | 58.5 | 2,194.6 | 1,401.8 | 792.8 | N.A | 12.4 |

Note : The number of cattle and buffaloes .... three years and above
Other animals ..... all ages

Source : 1980 Census of Agriculture (Modified)

2) Supply and Demand Balance of Feed

The total number of livestock and poultry are converted into the number of cow in unit, and are found by about 562 thousand head. The average of cultivated area per cow in unit is estimated at 0.34 ha, which implies that the livestock population is high in relation to the fodder potential amount. The feed sources consist of the crop residuals, hay of natural grass in the natural pasture and the grass of grazing land. The feed balance between the supply of the feed source and the estimated requirement for the above number of cow unit is shown as follows;

Supply and Demand Balance of Feed in Swat District

(unit: thousand ton)

| Item | Dry Matter | TDN | DCP |
|---|---|---|---|
| Supply | 1,182 | 421 | 21 |
| Requirement | 1,250 | 553 | 49 |
| Balance (Deficit) | 68 | 132 | 28 |
| Ratio of Deficiency (%) | 5.0 | 23.9 | 57.1 |

Note: Feed losses are assumed at ten percent of the total supply amount.
TDN: Total Digestible Nutrient
DCP: Digestible Crude Protein

The deficit of TDN and DCP is estimated at 23.9 percent and 57.1 percent, respectively, where the shortage of DCP is very significant. The feed supply of crop residuals as well as other sources of fodder is very unstable, and will vary by seasons and by years with the fluctuation of rainfall. In the high lying areas, the supply of feed is totally not available during winter. Under such conditions, the deficient or unstable supply of feeds is a primary cause of low livestock productivity. For the improvement of the low productivity, it is very important not only to increase fodder supply but also to raise livestock productivity per animal through improving genetic potential of the existing animals and intensifying the health control/vaccination services. Besides, it will be effective to increase the share of poultry production more than that of large and medium size animals, in considering the limited supply of feed in the area.

3) Animal Health Control

The followings are the common infections and parasitic diseases in the area according to the report of Livestock Office;

| | | |
|---|---|---|
| Cattle and Buffaloes | : | Pleuropneumonia, Food and mouth, Enterotoxemia, Black quarter Hemorrhagic septicemia, Liverfluke |
| Sheep and Goats | : | Liverfluke, Ticks and mites |
| Poultry | : | Newcastle disease |

Among the above diseases, the vaccination services are available for the pleuropneumonia, foot and mouth, black quarter, hemorrhagic septicemia and newcastle disease. However, there are a number of livestocks which suffer from the contagious diseases due to i) the limited number of veterinary hospitals and dispensaries, ii) the strains of such virus as foot and mouth disease and causes of other diseases, and iii) limited supply of vaccines.

4) Facilities of Veterinary Health and Artificial Insemination

List of Veterinary Health and Artificial Insemination Facilities
(As of 1988)

| Facilities | Swat | Shangl Par | Buner | Total |
|---|---|---|---|---|
| Veterinary Hospital 1/ | 9 | 0 | 1 | 10 |
| Veterinary Dispensary 2/ | 11 | 4 | 6 | 21 |
| Veterinary Center | 3 | 1 | 3 | 7 |
| Artificial Insemination Center | 1 | 0 | 0 | 1 |
| Artificial Insemination Sub-Center | 7 | 1 | 1 | 9 |

Note: 1/ A veterinary officer stays in each hospital, providing services of disease control, vaccination and parasitic control etc.
2/ A Stock assistant provides the services of vaccination and parasitic control.

Source : Livestock & Dairy Development Office and Artificial Insemination Project Office ( see Annex C for further details).

As indicated in the above table, it is clear that the facilities of veterinary hospitals, veterinary dispensaries and artificial insemination are deficient.

### 3.3.5. Inland Fishery

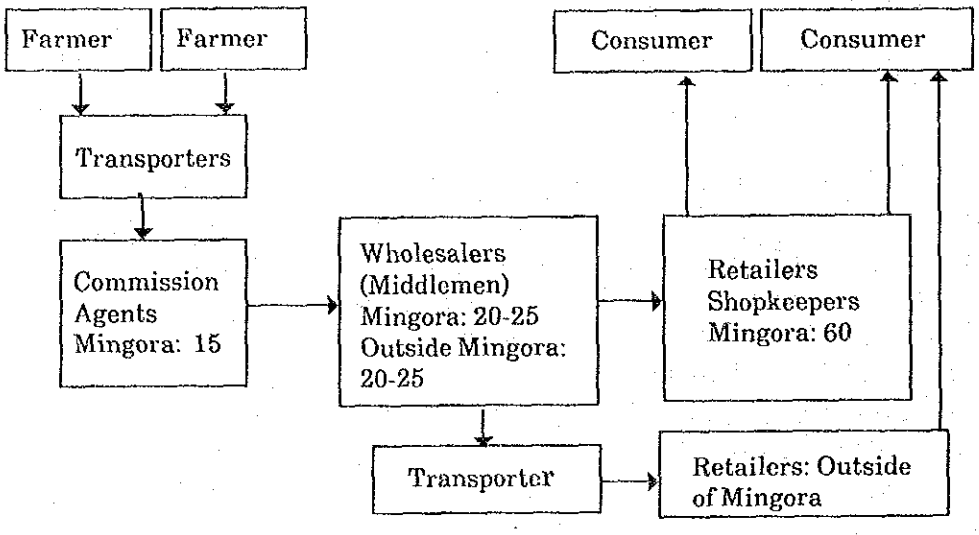
The fish catch of 45 tons in 1986 comes mostly from river fishing and the catches have been increased gradually in these 15 years (see Annex I). A trout hatchery was established in Madyan in 1961, having the annual production capacity of 0.2 million fry. With efforts to introduce trouts in all suitable waters in the District, the Upper Swat river, north of Madyan is teeming with it. Some 14,000 fingerings are supplied to about 13 fishpond operators who have the total operation area of 0.5 ha. However, the slow fish growth and high price of manufactured feeds impede for the trout culture to contribute the protein food supply in the region.

### 3.3.6. Marketing of Agricultural Products

The major agricultural products in Swat District are wheat, maize, tomato, onion, potato, cauliflower, apple, persimmon, and walnut.

The perishable products as vegetables and fruits are sent to the markets and sold to the consumers through wholesalers or commission agents. There are generally three-stage marketing systems for vegetables and fruits trade, i. e, commission agents, wholesalers or middleman and retailers as shown below:

Diagram of Marketing System




Note: Figure shows number.
Source: Food Controller Office, Saidu Sharif.

Commission agents sell with commission and the wholesalers purchase goods by open auction and sometime sell to retailers in small lots at the Mingora marketing (facilities) managed by the Municipal Council.

There are no other marketing facilities in Swat District, expect open market on Saturday at Sawari and Matta. Vegetables and fruits are also sold through preharvest contractors who will buy standing fields and themselves harvest and market the production, especially the marketing of fruits preharvest contractors purchase the standing fruit crops at flowering stage, and harvest the fruit, pack it and sale directly to commission agents in Mingora and wholesalers in the main markets in Peshawar, Rawalpindi and Karachi. Proper physical marketing facilities are insufficient in the Project Area. There is only one public marketing facility in Maingora.

The commodities like food grains of wheat, maize and rice are on the market through the channels of the wholesalers and commission agents without any government support system.

It was a governmental subsidy only for wheat at the rate of Rs. 36.32/100kg (13.6% of cost) since April 1987.

According to the Food Controller Saidu Sharif Office, the imported wheat and flour to Swat District were 22,647 tons from November 1987 to October 1988, and can be shared by government imports of 21,429 tons and other private imports of 1,218 tons respectively. In the same year, 7,832 tons of rice were imported to Swat District by private sector.

Many villages located in the hilly area in Swat District are quite remoted from the market of agricultural products; especially in the Shangla Par Sub-Division, the farm to market roads are provided insufficient at all. It is necessary to improve the Katcha road (rough and /or non-metaled road) to fulfill the socio-economic needs of the people of the main villages in the Project Area.

### 3.3.7. Extension and Research

#### 1) Extension

The agricultural extension services are inadequately rendered to farmers in the most areas of the District due to lack of the stationed extension staff and transportation facilities for the services, etc. However, the situation in the Buner Sub-Division is different from the other areas, because the "Training and Visit" systems have been introduced for an extension staff to cover about 800 farmers. On the other hand, an extension staff covers more than 5,000 farmers in the area outside the Buner Sub-Division. The strengthening of the extension activities is quite essential to improve the farm management , especially in the remote areas.

Although extension and research personnel make their efforts to maintain contact and regular meetings among them, there is no really effective linkage between the extension and research sectors, especially in the other areas than plain areas, where the lack of efficient and effective transfer of technology is one of the major constraints.

#### 2) Research

There are two agricultural research organizations in the District;

Agricultural Research Organization

| | Organization | Location | Activities |
|---|---|---|---|
| - | NWFP Agricultural University, Research Station | Mingora | Research on fruits, vegetables, pulses, potato and rice, oil seeds |
| - | Maize and Millet Research Institute | Pirsabac | Research on maize and millets |

In addition to the activities of the research organizations mentioned above, the following agricultural research and development projects have been carried out in the District;

i) Pakistan-Swiss Potato Development Project,

ii) NWFP Promotion of Fruits and Vegetables Cultivation Project, and

iii) Pakistan-Swiss Malakand Fruits and Vegetables Development Project.

The above-mentioned projects have no objectives for the development of the production technology in the specific areas, but they have their own activities under coordination with the said NWFP agricultural Research Station, Mingora and other various agricultural development institutes.

### 3.3.8. Farmers' Organization

#### 1) Cooperative Societies

Since the Cooperative Societies Office was established in Swat District in 1970, 314 of the cooperative societies have been organized as of 1987/1988 in the District as shown below;

Cooperative Society in Swat District

| Society | Swat | | Shangla Par | | Buner | | Total | |
|---|---|---|---|---|---|---|---|---|
| | A | B | A | B | A | B | A | B |
| Thrift and Credit | 2 | 100 | 7 | 169 | 2 | 60 | 11 | 329 |
| Multipurpose | 213 | 8,902 | 35 | 940 | 40 | 1,200 | 288 | 1,275 |
| Village Farmers | | | | | | | | |
| Dairy Farming | 3 | 65 | 1 | 10 | - | - | 4 | 65 |
| Women Handicrafts | 9 | 215 | 2 | 97 | - | - | 11 | 312 |
| Total | 227 | 9,282 | 45 | 1,216 | 42 | 1,260 | 314 | 11,758 |

Note: A: No. of Society, B: No. of Member
Source: Cooperative Societies Office, Swat District

The multipurpose village farmers' cooperatives render services to provide loans, farm inputs (seeds and fertilizers) and farm equipment (tractors, centrifugal pumps and tube-wells). The number of members in the cooperatives to the total farm households is estimated at only eight percent. The number of societies and the members has increased year by year. Very limited amount of loans, and farm equipment were released by the cooperatives. In comparison of the number of the cooperative in Swat and Shangla Par Sub-Divisions, the latter is considerably smaller (see Annex C).

2) Water Users' Association

During the period from 1982/1983 to 1985/1986, 38 Water Users' Associations were organized in the national irrigation systems by Mingora On-Farm Water Management Office in Swat District, including 36 associations in Swat Sub-Divisions and two associations in Buner Sub-Divisions. The On-Farm Water Management Office also serves to construct water tanks for the irrigation purpose in such areas as no other systematic irrigation systems are available. Despite there are so many farmers wishing to have both the tank irrigation schemes and also water management schemes elsewhere in the District, the allocated budget for the construction to the office is very limited amounts (see Annex C).

### 3.3.9. Agricultural Credit

Traditionally, agricultural credit in the Project Area has been available from the institutional sources as Agricultural Development Bank of Pakistan (ADBP), Cooperative Band and five Commercial Banks. All regional branches are in Mingora and Saidu Sharif, and their branch offices are located in larger towns as shown below;

Branches of Banks located in Swat District (1988)

| Sub-Division | ADBP | Muslim Commercial Bank | United Bank | Habib Bank | National Bank | Allied Bank | Cooperative Bank |
|---|---|---|---|---|---|---|---|
| Swat | Mingora<br>Matta | Mingora<br>Barikot<br><br>Khawaza-Khela | Kanju<br>Madyan | Madyan<br>Sambat<br>Cham Teh | Saidu Sharif<br>Matta<br><br>Aboha | Saidu Sharif | Saidu Sharif |
| Shangla Par | Alpuri | Alpuri-Besham | | | Sharpur | | |
| Buner | Daggar | Daggar | Torwarsak | Sawari<br>Nawagai<br>Anghapur<br>Bazargai<br>Deewana<br>Illai | | | |
| Total | 4 | 6 | 3 | 8 | 4 | 1 | 1 |

The Bank's disbursement of agricultural credit has been expanding year by year in the Project Area; for instance, the ADBP has fourteen special staffs of Mobil Credit Officers (MCO) in Swat District. They contact farmers directly to give the agricultural loans to purchase tractors and other equipment, seasonal inputs like seeds, fertilizer, dairy farming, minor-irrigation facilities, poultry raising, fish farming and so on.

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However, the tenant farmers have no direct access to institutional credit, and their major source of borrowing is their land owners. And most of small farmers borrow the small amount of money from friends, relatives and are usually not willing to disclose this sort of debt.

It should be noted that most of the credit for the tenant farmers and small owner farmer is provided by non-institutional sources, including commission agents, wholesalers or middle men, and large land owners.

In the early 1980s, the institutional banks gave the credit upto Rs 6,000 at the interest-free to those farmers holding land less than 5.0 ha(12.5 acre) for their purchase of various inputs throughout the year (this limit was raised to Rs. 12,000 in 1985). However, the land owners forced tenant farmers to borrow this interest-free loans in order to use the loans for themselves. It was canceled in 1987 because of the above reasons. Nowadays, these banks are charging 12 percent of interest for agricultural credit.

### 3.3.10. Demand and Supply of Agricultural Products

The District-wise demand and supply of agricultural products in Swat District have been studied in using the estimated population of 1,233 thousand in 1981, the production of five main crops and yearly self-sufficient volume per capita in 1986/1987. The result is shown in the following table;

Production and Consumption of Major Crops in Swat

(unit: 1,000 ton /year)

| Crop | Production | Consumption | Demand | Surplus/ Deficit |
|---|---|---|---|---|
| | | (kg/year/capita) | | |
| Wheat | 96.9 | 144.0 | 216.0 | -119.1 |
| Maize | 127.7 | 7.2 | 10.8 | 116.9 |
| Rice | 32.2 | 7.3 | 11.0 | 21.2 |
| Vegetable | 90.5 | 36.1 | 54.2 | 36.3 |
| Fruits | 63.4 | 27.6 | 41.4 | 22.0 |

Source: Agriculture Department, Swat.
Household Income and Expenditure Survey 1984/1985, Swat.

Wheat is the staple food and the consumption per capita is large in quantity in the District. The total production in the area is only about 97 thousand tons a year, while the demand about 216 thousand tons (144 kg/year/capita). Consumption of maize is about 11 thousand tons for the production of about 128 thousand tons. However, the demand of maize in Swat District can be assumed that the consumption per capita may increase more than the above-mentioned estimates. And the rice consumption is found less than the production in the District according to the above table. However, the actual consumption has recently increased and about 8 thousand tons have been imported from Punjab Province in 1987/1988. While, 22 thousand tons of wheat have been imported in the same year, and the 15 thousand Afghan refugees consumed about 2,500 tons in the same year.

Fruits are one of the unique products of Swat District. Most of the fruit products such as apples, persimmons, walnuts, etc. are exported. Particularly, a plenty of apples (about 22 thousand tons a year) are exported to Peshawar and Islamabad.

The production of four kinds of vegetables such as potato, tomato, onion and cauliflower has reached about 90 thousand tons a year and about 40 percent of the products has been exported to the big consumer places.

## 3.4. Rural Industry

Almost all primary products of agriculture, forestry and fisheries are consumed without processing in the District or exported outside because of very few agro-based industries available in the District. For example, a plenty of substandard fruits and strawberries are left rotten in the fields at the peak of harvest seasons. The list of existing agro-based industry units and the prospect on the newly establishment of these industries are shown in Table 3-6. One of the most promising industries is fruit processing unit. Besides the agro-based industries, the development of marble processing will be tapped under the Buner Development Project to utilize the rich deposits.

As previously indicated, 11 primary Women Handicraft Societies and one Association of the societies have been established with a total member of 312 in Mingora and its vicinity. The association members are provided with training and credit for sewing, embroidering, and knitting by the Women Handicrafr Center of Cooperative Society Office in Saidu Sharif. Although the activities of these societies have been expanded every year by the training and credit services provided by the center, those activities are extended only to the limited area around Mingora. There is a great need to create job opportunities for utilizing the women labor in the areas outside Mingora. For this purpose, it is desirable to expand the above-mentioned activities of Women Handicraft Societies. It will be required to promote organizing the societies with provision of building of handicraft works and equipment for sewing, embroidering and knitting, and also to strengthen the activities of the Women Handicraft Center.

Since the raw materials such as marbles, gem stones, wood, etc. are available in the area and also a large number of tourists visit the District, the cottage industry of handicraft works should be developed in the future.

TABLE 3-6 LIST OF AGRO - INDUSTRY (1987/1988)

| Industry | Sub - Division | | | | Prospect of Future Development |
|---|---|---|---|---|---|
| | Swat | Shangla Par | Buner | Total | |
| 1. Food Products | | | | | |
| 1) Flour Mill | 7 | 4 | 2 | 13 | |
| 2) Rice Mill | 6 | 4 | 2 | 12 | |
| 3) Oil Mill | 6 | 4 | 2 | 12 | |
| 4) Sugar Mill | - | - | - | - | |
| 5) Bakers | 14 | 5 | 2 | 21 | |
| 6) Ice Factory | 4 | 2 | - | 6 | |
| 7) Dairy Products | - | - | - | - | |
| 8) Fruit Products | 1 | - | - | 1 | New fruit processing unit at Mingora |
| 2. Others | | | | | |
| 1) Cigarlets | - | - | - | - | |
| 2) Textile/Wollen Products | 89 | 17 | 17 | 106 | |
| 3) Leather Tunning | - | - | - | - | |
| 4) Carpets and Blankets | 1 | - | - | 1 | |
| 5) Silk Yarn | 182 | - | - | 182 | |
| 6) Saw Mill | 14 | 6 | 2 | 22 | |
| 7) Furniture Making | 28 | 6 | 2 | 36 | |
| 8) Match Making | - | - | - | - | |

Source : Industrial Development Office, Swat

## 3.5. Agricultural Infrastructure

### 3.5.1. Irrigation

#### 1) Irrigated Farmland

The present cultivated and irrigated areas by different water sources in the Project Area are as shown below;

Cultivated Land and Irrigated Area by Different Water Source
(1986/1987)

| Sub-Division | Cultivated Area | Irrigated Area | Rate of Irrigated Area | Irrigated Area by Different Sources ('000 ha) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Canal | | Well | | |
| | | | | Govt. | Prive. Civil | Deep Well | Dug-Well | Pump |
| | ('000 ha) | ('000 ha) | (%) | | | | | |
| Swat | 99.1 | 39.3 | 39.7 | 2.1 | 31.2 | 0.0 | 3.7 | 2.3 |
| Shangla Par | 41.5 | 3.3 | 8.0 | - | 3.0 | - | - | 0.3 |
| Buner | 55.2 | 6.2 | 11.2 | 1.4 | 3.3 | 0.1 | 1.0 | 0.4 |
| Total | 195.8 | 48.8 | 24.9 | 3.5 | 37.5 | 0.1 | 4.7 | 3.0 |

There is the flat cultivated land extending on both banks of the Swat river. The irrigated farming has been practiced commonly since old times along the river, and the endeavor has been made to extend the irrigation area in order to steal out of the Barani dry farming.

And, the agricultural productivity hovers around the low level in Shangla Par and Buner Sub-Divisions in comparing with that in Swat Sub-Division, because the disadvantage topographical and water resources conditions impede the development of irrigation and farming activities there.

#### 2) Irrigation Works

In addition to the operation and maintenance of the existing old private and civil irrigation facilities, the governmental schemes and works for consolidation and improvement of the agricultural

infrastructure are executed by the Irrigation Department and the Water Management Department in the following jurisdiction.

a) Irrigation Department (ID)

- Construction, improvement and repairing and maintenance of government canals schemes (from head regulator to Mogha outlet in distributary)
- Improvement of private and civil canals
- Construction, improvement, repairing and maintenance of river protection for flood control and land conservation
- Construction, repairing and maintenance of tube-wells and lift irrigation schemes
- Preparing and maintenance of existing three mini-hydel power plant.

b) Water Management Department (WMD)

- Construction, improvement and reparing and maintenance of water courses, minor canals and Nacca outlets following the Mogha outlets installed in government canals/schemes
- Water storage tanks and the distribution systems for irrigation
- Supervision and technical assistance for construction and maintenance of private and civil canals using spring and stream water for irrigation
- Supervision and technical assistance for land leveling works of irrigated field

The major works to be conducted by the both Departments mentioned above are as follows;

Schemes executed by the Irrigation Department

The irrigation schemes to be carried by ID in the last 10 years have come to be 16 schemes, and the new irrigation area has reached about 4,350 ha in total. In following the above, the six new irrigation schemes have been commenced recently to cover the new irrigation area of about 1,800 ha in total (see Annex D).

In the above-mentioned irrigation schemes, 12 schemes are carried out in Buner Sub-Division and only one improvement scheme has been executed in Shangla Par Sub-Division.

Schemes executed by the Water Management Department

In water respect, the works to have been carried out by the WMD in the last six years are as follows;

WMD Irrigation Works

| Sub-Division | Water Course Lining | Reservoir Tank | | Expenditure |
|---|---|---|---|---|
| | | Tank | Pipeline | |
| | (m) | (No.) | (m) | ('000 Rs) |
| Swat | 12,201 | 20 | 5,194 | 4,982 |
| Shangla Par | - | - | - | - |
| Buner | 745 | - | - | 220 |
| Total | 12,946 | 20 | 5,194 | 5,202 |

3) Current Problems on the Existing Irrigation Facilities

The problems faced at present in irrigation activities are pointed out as follows;

- Conventional type of water intakes can not take in the regular quantity of water, since it is always damaged by the flood.

- Large conveyance losses occur with leakage and collapse of unlined canals.
- Crossings of canals on the streams and gullys are damaged by the sharp water flow.

### 3.5.2. Farmland Consolidation

#### 1) Barani Farmland

There are many rainfed dry farming (Barani) fields developed up to the top of the hills in Shangla Par and Buner Sub-Divisions. The fields do not receive irrigation water in the farming season because of the higher locations than water sources. The productivity in such lands is very low. While the fields are exposed to the severe rainfall in the Rabi (winter) and Kharif monsoon seasons, and eroded and collapsed despite protected with terraces, trenches and vegetations by the individual farmers' efforts.

The land consolidation works with the unification and leveling of the existing small pieces of land have not yet been carried out both in the irrigated farmland and Barani field due to lack of adequate work technics, machinery and labour.

#### 2) Farm Road

There are no farm roads provided even for a handcart or bullcart, excepting for the small access roads from main road to villages, passing through the cultivated areas. The levees and field boundaries are used for footpaths. This condition causes inconvenience and inefficient in farming activities.

### 3.5.3. Flood Control and River Protection

Since the natural reservability (water holding capacity) is low in the watersheds in the Project Area, the Swat river, the Barandu river and their tributaries rapidly increase in the discharge immediately after heavy rainfall in the rainy seasons (Rabi and Kharif). The river discharge changes into a mud flow or sometimes an avalanche of earth and rocks,

and it makes severe damage to farmlands,residential area, public utilities such as irrigation facilities, buildings and roads etc.

The flood control and protection works of the farmland and irrigation facilities along with the rivers fall into the jurisdiction of the Irrigation Department. However, except for the locally executed small works, most of the works have been carried out only along the Swat river (see Annex D).

The works are to cover and protect the curved parts of main streams and the confluences of the tributaries by installing the gabions and stones/wire mattresses, etc. and to make spurs with stone masonry works and gabions in order to stop erosion and flush of river banks and farmlands caused by the sharp flows. However, neither prevention of land from inundation by means of waterproof dikes, nor increase in flowing capacity by means of reforming and trimming of the sectional area of the rivers has yet executed.

In the Swat river, the river protection works have been carried out at three places in spending about one million Rupees. The new large scale scheme will be commenced soon at the site between Bagh Derai and Shamozai bridge along the Swat river.

## 3.6. Road and Transportation

### 3.6.1. Road

In Swat District, Highway Division, Communication & Works Department is responsible for the construction and maintenance of roads. The length of roads maintained by the Communication & Works Department in Swat District is shown below in comparison with that of NWFP.

Road Condition in Swat and NWFP (1988)

| Item | Class | Length (km) | Road Density (km/sq.km) | Percentage of High Type Roads (%) |
|---|---|---|---|---|
| Swat | High Type | 593.7 | 0.073 | 58.1 |
| | Low Type | 427.4 | 0.052 | |
| | Total | 1,021.1 | 0.125 | |
| NWFP | | | | |
| | High Type | 3,289.6 | 0.061 | 51.5 |
| | Low Type | 3,094.1 | 0.057 | |
| | Total | 6,383.7 | 0.118 | |

Source: Communication & Works Department, NWFP

Notes: High type road includes the following kind of surface:
i)black top, ii) concrete and iii) macadam.

Low type road includes:
i) black top, ii) stabilized, iii) natural surface,
iv) banked earth, v) brick paved and vi) other track way.

The road density and percentage of high type roads to the total road length in Swat District are slightly higher than those of NWFP. However, the road density in the District is equivalent to only one fifth of the prescribed minimum of 0.64 km/sq.km of the area, which is the target of rural development in Pakistan (Sixth Five-Year Plan 1983-1988).

The main roads in the District are mentioned below;

- The traversed road from Malakand to Kalam along the Swat river (Provincial Primary Highway);

  The road runs through Swat Sub-Division and is the most important road in the District. Improvement works are carried out in the Upper Swat area, from Bahrain to Kalam, by foreign finance. In the part of the Lower Swat area, there is a paved road from Kabal to Matta, which runs parallel to the main road on the opposite bank of the Swat river.

- Barikot - Daggar - Totalai road (Provincial Secondary Highway);

  The road connects Barikot, on the main road of Swat Sub-Division and Daggar which is the center of Buner Sub-Division. The road is the trunk road of Buner running through the Sub-Division and reaches Mardan.

- Khawazakhela - Alpuri - Besham road (Provincial Primary Highway);

  The road connects Khawazakhela on the main road of Swat Sub-Division,and Besham on the Karakoram National Highway, via Alpuri which is the capital of Shangla Par Sub-Division. The road is the trunk road of Shangla Par Sub-Division.

The above-mentioned three trunk roads form the key network of roads in Swat District and are paved and fairly maintained. Although Shangla Par and Buner Sub-Divisions are neighbours, there is no road to connect them directly. The trunk roads have branch roads (Provincial Secondary Highways, District roads and others) which connect individual villages. The majority of branch roads are neither paved nor linked with another trunk or branch road. In the Upper Swat area and Shangla Par Sub-Division, the road density is relatively low due to their geographical features with mountainous areas.

The problems of the existing roads in Swat District are summarized below;

- Main Roads:

  The Highway Division indicates that the present trunk roads would not be safe from traffic accidents due to their

inadequate alignment and insufficient width although there is a lot of traffic on the roads.

- Branch Roads:
  Non-paved branch roads always required the thorough maintenance works, and therefore it would be difficult to secure traffic in the rural area. They can provide only low speeds of 10 to 15 km/hr, and is uncomfortable for transportation. It is strongly requested to pave the roads by the related villages.

### 3.6.2. Transportation

There are daily flights of PIA between Saidu Sharif and Islamabad and between Saidu Sharif and Peshawar. The transportation in Swat District, however, mainly depends upon motor vehicles. The table below shows the number of motor vehicles in Swat District and in NWFP.

Number of Motor Vehicles in Swat District and NWFP (1985)

| Classes | Swat District | | NWFP | |
|---|---|---|---|---|
| | Number | Percent (%) | Number | Percent (%) |
| Motor Cucles and Scooters | 1,788 | 17.9 | 26,780 | 20.2 |
| Motor Cars, Jeeps and Station Wagons | 3,451 | 34.5 | 39,858 | 30.1 |
| Tractors | 1,198 | 12.0 | 14,804 | 11.2 |
| Buses | 341 | 3.4 | 7,224 | 5.5 |
| Motor Cabs (Taxis) | 1,260 | 12.6 | 8,484 | 6.4 |
| Motor Cabs (Rickshaws) | 521 | 5.2 | 6,001 | 4.5 |
| Delivery Vans | 726 | 7.3 | 5,661 | 4.3 |
| Private Trucks | 33 | 0.3 | 375 | 0.3 |
| Public Trucks | 681 | 6.8 | 16,643 | 12.6 |
| Others | - | 0 | 6,482 | 4.9 |
| Total | 9,999 | 100.0 | 132,312 | 100.0 |

Source: Statistic Data, NWFP

The number per motor vehicles per capita was estimated about 150 and 120 in Swat District and NWFP, respectively. It can be said that the number of motor vehicles in the District will not reach that of the provincial level, especially the number of large-size vehicles such as buses and trucks. The unfavourable road conditions would be one of the reasons. As for tractors, they are used not only for farm land cultivation but also for transportation with trailers..

## 3.7. Power Supply

### 3.7.1. Electric Power Supply

The electric power supply is made by WAPDA (Water and Power Development Authority) in charge of large scale systems and Irrigation Department in charge of small scale systems. SHYDO (Small Hydel Development Organization) is under Secretary Irrigation and Public Health Engineering ,Government of NWFP. Their activities are summarized as follows;

WAPDA: WAPDA is working on national level with responsibility for construction and management of large power stations and transmission networks. In Swat District, WAPDA controls two transmission stations with 132 KV power-lines. It supplies electricity to Swat and Buner Sub-Divisions divided into following seven areas.

| | | |
|---|---|---|
| Amankot; | Khawazakhela | 159 villages |
| (Swat) | Matta | 34 |
| | Kabal | 50 |
| | Urban Saidu Sharif | 41 |
| | Rural /Amankot | 34 |
| Karapa; | Daggar-1 | 47 |
| (Buner) | Daggar-2 | 39 |
| | Total | 404 |

SHYDO: In order to carry out small-hydel power schemes, SHYDO has been established recently. It does not have any completed scheme yet, but is planning schemes with the capacity of 200 KW or more up to 5MW.

Irrigation Department:

Irrigation Department (Power Wing) is in charge of operation and maintenance of the existing power schemes. In Swat District it is operating three systems, of which two are in Shangla Par Sub-Division, Damorai (100 KW) and Karora (200 KW) and one is in Swat Sub-Division, Kalam (200KW) as follows.

Present Mini-Hydel Power in Swat District

| Item | Damorai | Karora | Kalam |
|---|---|---|---|
| Completion Year | Dec.1982 | Dec.1984 | Jun.1984 |
| Capacity (KW) | 100 | 200 | 200 |
| Construction Cost (million Rs) | 7.76 | 20.00 | 6.06 |
| Installation Cost, ($10^3$ Rs/KW) | 77.6 | 100.0 | 30.3 |
| Agency Concerned | MWP1/ | MWP | ID 1/ |
| Population Served | 3,000 | 6,000 | 8,000 |

1/: MWP; Ministry of Water and Power
ID; Irrigation Department (Power Wing)

### 3.7.2. Power Demand and Supply

The electricity consumption by domestic and commercial use occupies 97 percent of the total in the District and that by industry and irrigation such as tube-wells and lift pumps occupies two and one percent, respectively. A coverage of electrification was estimated at about 30 percent of the total households. Electricity supply to lift pumps for irrigation and drinking water is very important. However, that for drinking water supply is a problem for the expansion of water supply schemes, due to the negative aptitude of the public to paying the charges. The schools, hospitals and other public facilities in rural area are behind in electricity supply.

The electricity supply system of WAPDA covers midstream and lowerstream areas of the Swat river and Buner Sub-Division, which are fairly maintained. Electricity supply in the Upper Swat area and Shangla Par Sub-Division, however, depends upon mini-hydel power schemes which have very limited coverage.

### 3.7.3. Rural Electrification

The number of the villages (Mauza, Deh, Hamlet) in Swat District is 1,695, of which 404 are electrified, and the coverage is estimated at only 24 percent, which is lower than that of the Sixth Five-Year Plan's target of 38.3 percent in 1987.

The electrification coverage in each area which is estimated from the inquiry survey conducted by JICA Study Team is summarized as follows;

- Mid and down stream areas of Swat Sub-Division ; 40 - 50%
- Upstream area of Swat Sub-Division and Buner Sub-Division ; 20 - 40%
- Shangla Par Sub-Division ; 10% or less

This local difference comes from their topography, population distribution, and location of transmission networks. Non-electrified villages, especially in Shangla Par Sub-Division, are constrained in various fields which are health care, education, irrigation and village water supply, industries and household matters.

## 3.8. Rural Water Supply

The Government of NWFP recognizing the importance of water supply facilities which are one of the basic infrastructures, is providing water supply system for the rural area to secure hygienic and potable drinking water through the Public Health Engineering Department (PHED). The water supply schemes in Swat District are controlled by the Executive Engineer of PHED in Mingora. The Department is handling water supply schemes with 400 to 500 houses covered on an average and responsible for planning, designing, implementation and maintenance of completed schemes. Also they collect the water charge from consumers through house connections. Every house connection is charged with 20 Rupees per month but the revenue return position is not encouraging due to reluctance aptitude of the public to payment. On the other hand, water supply service through community stand posts is at free of charge and, therefore, distance for fetching the drinking water will be reduced to alleviate the hard works especially for girls and women.

According to the Sixth Five-Year Plan of the Government of NWFP, population served by water supply in the rural and urban areas would be increased from 35 and 70 percents to 45 and 80 percents, respectively. The population coverage in Swat District was reported in 1986 to be 26 and 83 percent on the average in the rural and urban areas, respectively. The coverage in the Swat rural area was far from the target set in the Sixth Five-Year Plan of NWFP.

The Sub-Division-wise population coverages in Swat District upto June 1988 are shown as follows;

Coverage of Water Supply Schemes in Swat

| Sub-Division | No. of Schemes Completed | Total Expenditure | Population Coverage |
|---|---|---|---|
| | | (million Rs) | (%) |
| Swat | 59 | 39.2 | 31.0 |
| Shangla Par | 38 | 3.9 | 28.5 |
| Buner | 46 | 34.0 | 43.6 |
| Total | 143 | 77.1 | 33.4 |

The above table indicates the gap among the development levels of the Sub-Divisions, because the coverage of water supply schemes in Shangla Par Sub-Division shows the lowest figures with a small amount of investment which is equivalent to only one tenth of each one for Swat and Buner Sub-Divisions. Also the number of on-going and new water supply schemes in Annual Development Programme, 1988-1989 in Swat District is 39, of which 25 are in Swat Sub- Division, 8 are in Buner Sub-Division and only 6 are in Shangla Par Sub-Division. And hence, the gap would remain.

The gap has been brought about from the fact that pumping systems have become unavoidable for planning of the water supply schemes, since the potential sites for gravity system have become decreased in number.

The following table shows the present conditions of water supply in Shangla Par Sub-Division, suggesting that power supply will become vital important to develop the water supply system by pump in the said Sub-Division.

Existing Water Supply Schemes by Water Sources

| Sub-Division | Spring | Infiltration Gully | Tube-Well | Collector Well | Total | Pumping 1/ |
|---|---|---|---|---|---|---|
| Swat | 14 | 2 | 26 | 8 | 50 | 24 |
| Shangla Par | 29 | 2 | - | - | 31 | - |
| Buner | 18 | 3 | 14 | 7 | 42 | 11 |
| Total | 61 | 7 | 40 | 15 | 123 | 35 |

Note: 1/ Pumping by electric power

Source: Public Health Engineering Department, Swat

## 3.9. Soil Conservation and Forestry

### 3.9.1. Soil Conservation

According to the data of the cultivated and range land by slope in each Sub-Division, about 80 percent of cultivated land has the slope less than 50 percent in Swat and Buner Sub-Divisions,while about 70 percent of cultivated land in Shangla Par Sub-Division is more than 50 percent. The areas of the range land which has the slope more than 50 percent is covering about 60 to 90 percent of the total range land in each Sub-Division.

Cultivated Land and Range Land by Slope

(unit: '000 ha)

| | Cultivated Land | | | Range Land | | |
|---|---|---|---|---|---|---|
| Sub-Division | Less than 50% | More than 50% | Total | Less than 50% | More than 50% | Total |
| Swat | 88.7 | 10.4 | 99.1 | 51.2 | 69.5 | 120.7 |
| | (89.5) | (10.5) | (100.0) | (42.2) | (57.6) | (100.0) |
| Shangla Par | 12.1 | 29.4 | 41.5 | 6.1 | 39.8 | 45.9 |
| | (29.3) | (70.7) | (180.0) | (13.3) | (86.7) | (100.0) |
| Buner | 51.4 | 3.8 | 55.2 | 21.6 | 49.2 | 70.8 |
| | (93.1) | (6.9) | (100.0) | (30.5) | (69.5) | (100.0) |
| Total | 152.2 | 43.6 | 195.8 | 78.9 | 158.5 | 237.4 |
| | (77.7) | (22.3) | (100.0) | (36.4) | (63.6) | (100.0) |

In 1987/1988, the Soil Conservation Project Office in Swat was established under the Department of Agriculture and takes charge of overall soil conservation activities in the District under the Provincial Soil Conservation Project (1986/1987 to 1988/1989). At least 23 percent of the total cultivated areas with slope more than 50 percent would be severely affected by water erosion due to highly intensive monsoon rainfall. Similarly, about 100 ha of fertile alluvial land is washed away by river flow during monsoon seasons. Statistically, there are about 185,000 ha of cultivable waste land, which could be converted into productive

farm land by taking adequate conservation measures in Malakand Division.

Under the circumstances, the above-mentioned Project Office has implemented the following soil conservation works in the District;

Soil Conservation Works (1986/1987-1988/1989)

| Item of Works | Target Area (ha) |
|---|---|
| - Pacca cemented structures 1/ | 82 |
| - G.I wire netting structures 2/ | 140 |
| - Pond development 3/ | 5 |
| Total | 227 |

Source: PC-1 Proforma on Scheme for Soil Conservation Project for Central and Northern District of NWFP.

Note: 1/ Including the following structures:
cemented outlet, inlet and spillway and check dam for controlling velocity of water flow in a gully.

2/ The structures to protect bank erosion from flood.

3/ The structures to plugg narrow passage of torrents over rocky portion and stock water in the upper reaches.

Among the above structures, the pond is very useful and effective for soil conservation in the eroded areas, because of its multiple advantages of decreasing runoff and checking erosion, also storage of water, plugging gully, conservation of under groundwater for water supply, and fish breeding.

According to the Project Office, the above soil conservation activities will be expanded to a plenty of potential applicants to the conservation schemes, if bulldozers and other related equipment are available. The bulldozers could be used for land leveling works in the fields.

## 3.9.2. Forestry

### 1) Present Situation of the Forest

The forests in Swat District are divided into two forest Divisions in terms of management as the Swat Forest Division and Alpuri Forest Division, which are different from each other in the administrative Division in Swat District. The former Division covers Swat and Buner administrative Sub-Division. Each Division is managed by Divisional Forest Officer.

The total forest areas in Swat District in 1988 are 2,160 sq.km, consisting of Swat Forest Division of 1,720 sq.km and Alpuri Forest Division of 440 sq.km, which is equivalent to about 25 percent of the total area of 8,788 sq.km.

The ownership categories of the forests in the Pakistan are generally classified into three types of reserved forest, protected forest and private forests, and the following table indicates the ownership of forests in Swat District.

Ownership of Forests in Swat District (1988)

(unit: sq.km)

| Division | Reserved Forest 1/ | Protected Forest 2/ | Private Forest 3/ | Total |
|---|---|---|---|---|
| Swat Div. | - | 1,720 | - | 1,720 |
| Alpuri Div. | - | 440 | - | 440 |
| Total | - | 2,160 | - | 2,160 |

Source: *Forest Department, Malakand Division*

Note: 1/ Reserved Forest;
The government has the complete ownership. But the villages adjoining these forests have the rights for grazing.

2/ Projected Forest;
The Government has taken over the legal ownership from the Ruler (wali) of Swat in 1969. At present these forests are communal forests under the management of the Forest Department. The local peoples receive upto 60 - 80 percent of the proceeds of timber, and there is a long tradition of right for grazing, firewood and domestic timber.

3/ Private Forest;
This type of forests is owned by the local peoples (individuals, family groups or villages), but are managed by the Forest Department, which keep 20 percent of the revenue to cover the cost of the management.

Under these existing forest conditions, the total annual harvesting volume of timer for the past three years (1985/1986 to 1987/1988) in Swat District is summarized as follows;

Annual Harvesting Volume of Timber

(unit: '000 cu.m)

| Year | Commercial Concession | Local Concession | Total |
|---|---|---|---|
| 1985/1986 | 30.3 | 4.0 | 34.3 |
| 1986/1987 | 25.9 | 10.9 | 36.8 |
| 1987/1988 | 27.2 | 12.5 | 39.7 |
| Average | 27.8 | 9.1 | 36.9 |

Source: Forest Department, Malakand Division

Expecting the scientific management, the forests are marked under the approved Working Plans by the Forest Development Corporation (FDC), which was established in 1977 for timber harvesting, sale of forest procedure, and establishment of primary wood processing units. Annual revenue from the forests is amounted at Rs.33.65 million on an average in Swat District, and on the other hand, afforestation programme by the Forest Department is increasing year by year as shown below, owing to the on-going afforestation schemes.

Annual Revenue and Afforestation Area

| Year | Annual Revenue (million Rs) | Afforestation | | |
|---|---|---|---|---|
| | | Normal Budget (ha) | Development Scheme 1/ (ha) | Total (ha) |
| 1985/1986 | 46.15 | - | - | - |
| 1986/1987 | 31.58 | 527 | - | 527 |
| 1987/1988 | 23.23 | 49 | 1,418 | 1,467 |
| Average | 33.65 | 192 | 473 | 665 |

1/: On-going afforestation schemes:
- Kalam Integrated Rural Development Project
- Income Generating Project in Buner

Out of the annual revenue mentioned above, the public concession (adjoining land owner) would be entitled by 60 percent of the

sale proceeds from the forests in Swat and Shangla Par Sub-Divisions and 40 percent would be shared for government for bearing expenses of maintenance and development of forests, while 80 percent of the public and 20 percent of the government respectively in Buner Sub-Division, in accordance with rules for the management of forests issued by the Government of NWFP in 1975.

The privileges enjoyed by the local peoples are as follows:

- Free grazing of domestic animals
- Grass cutting and lopping of trees for fodder
- Free collection of brush-wood and fire wood
- Free grant of constructional timber to the concessionaire
- The land owners are free from nomads for grazing cattle, sheep and goats in the high hill pastures

## 3.10. Rural Infrastructures

### 3.10.1. Education

In education in Pakistan it is very important to improve the participation rate of primary education and the literacy rate. According to the National Census 1981, the literacy rate of Swat District by 15.1 percent for men and 1.7 percent for women has been lower than that of the average in NWFP. The literacy rate of the rural area by 7.6 percent was especially as low as about a half of the provincial figures of 13.2 percent for both men and women. Shangla Par Sub-Division with the rate of 4.8 percent is the lowest rate in Swat District.

The following table indicates that the estimated participation rate of schools in 1987 in Swat District are derived from the available statistic data.

Participation Rate of School in 1987

(unit: %)

| Sub-Division | Boys | Girls | Total |
|---|---|---|---|
| Swat | 45 | 6 | 26 |
| Shangla Par | 28 | 2 | 15 |
| Buner | 43 | 3 | 23 |
| Total | 41 | 5 | 23 |
| NWFP (Rural) | 83 | 19 | 52 |

With the Pakistan national policy, the participation rate of children at primary schools in the Sixth Five-Year Plan has been targeted to increase from 50 percent in 1982/1983 to 75 percent in 1987/1988. The rate of Swat District, however, would be 23 percent (41 percent for boys and 5 percent for girls) which is extremely lower than that of the provincial average in rural areas and of the national target.

Based on the catchment area of schools, a reciprocal number of the density of schools which would be calculated from available data can be said that there is a shortage in number of schools in the case of primary schools for both boys and girls (Swat; 10.0, 38.3 sq.km/school, NWFP; 8.0, 24.9 sq.km/school) and of middle and high schools for girls. The latter case

is very severe, and it is possibly one of the reasons of the very lower participation rate.

The low literacy rate of the rural people may be another reason of the lower participation rate. The data of a previous investigation shows that only educated parents send their children to school, whereas the illiterate parents wish their children to join them in their professions due to family traditions or economic reasons.

The facilities of schools are generally insufficient. In accordance with the statistic data on the 79 boys high schools, they do not have water supply systems, play ground, science education facilities, workshops and examination hall, and one-third of them are not served with electric supply. In the case of the four girls high schools, such kind of data is not available.

The problems in the education sector in Swat District can be summarized as follows:

- The shortage of number of schools causes a long distance walk between schools and children's houses (average of one to eight kilometer). The shortage of girls schools is a serious problem. Also, the poor road condition in the rural area is being obstacle to children's easy accessibility.
- The shortage of number of teachers, and
- The poor facilities, teaching materials and others can not be improved due to the insufficient education budget.

The Government of NWFP has been making efforts to raise participation rate at primary school for local children by providing the school buildings increasingly in Swat District. The children's connecting distance can be decreased considerably to result in encouraging the parents to send their children to school. An establishment of 178 new primary schools (on-going and new) is planned in Annual Development Programme (1988-1989) of NWFP. The ratio of establishment of boys primary schools to that of girls primary schools is almost one to one. The proportion among three Sub-Divisions, however, is 4 : 1 : 1 for Swat, Shangla Par and Buner Sub-Divisions, respectively. Consequently, the unfavourable conditions of primary education in Shangla Par and Buner

Sub-Divisions will not be improved immediately, and the primary education for girls still suffers from lack of opportunity.

### 3.10.2. Health Services

The medical services in Swat District consists of a District Headquarter Hospital, three Tehsil Headquarter Hospitals, Civil Hospitals, Rural Health Centre (RHC), Basic Health Units (BHU), Dispensaries and others. The activities of those health institutions are originally defined as follows:

Five to ten BHUs are linked with a RHC. A BHU is provided to serve about 5,000 to 10,000 people with one doctor. A BHU is responsible for comprehensive health care which, among other things, includes midwifery, child immunization, control of diarrhocal diseases and malaria, child spacing, mental health and school health services within its area. A RHC provides medical care to a population of 10,000 to 50,000 with three doctors, including a dentist and a lady doctor. A RHC may have beds upto 25 with laboratory, X-ray and minor surgery. RHCs are linked through Tehsil Hospitals to District Headquarter Hospitals which have all medical facilities. Dispensaries are the lowest class of health institution although their activities are not efficient due to lack of doctors.

The population per health institution in Swat District was estimated at 13,900 on an average. In considering the inadequate functions of the existing dispensaries, the above figures are probably far from the targets of the basic health care by 9,820 people per health institution in the Sixth Five-Year Plan. The shortage of doctors in numbers is one of the most serious problems in the health care in Swat District. The population per one health institution in the District is less than that in NWFP by 20,136, although it is still big. The population per one doctor in the District, however, was bigger than that in NWFP. They can be estimated at 14,500 and 10,800 in Swat District and NWFP, respectively.

As for the serious obstruction factor of the health care development in Swat District, the present health care activities are suffering from lack of the infrastructure such as roads, electricity, and water supply, especially in the rural areas. In order to improve the health

care, the establishment of the above mentioned rural infrastructures should come in the first place.

### 3.10.3. Sanitation

During the Fifth Five-Year Plan, no significant work has been done in the rural sanitation improvement. The coverage of rural sanitation schemes was only 0.3 percent of the rural population in NWFP by the end of the Fifth Five-Year Plan, 1983. In order to improve such unfavourable conditions of the rural sanitation, the Government of NWFP is carrying out construction of the rural sanitation systems through the Public Health Engineering Department (PHED). According to the target of the Sixth Five-Year Plan, the sanitation facilities will be provided in NWFP with the population coverage of 1.5 and 28.3 percents for rural and urban respectively by the end of the Sixth Five-Year Plan, 1988. Although the coverage of rural sanitation can be expected to rise from 0.3 percent to 1.5 percent during the Sixth Five-Year Plan, the rural living condition would be still far from the hygienic environment.

The Annual Development Programme 1987-1988 of NWFP contains only three on-going sanitation schemes in Swat District, but none of new schemes, and the allocated budget was 1.2 million Rupee, which is equivalent to seven percent of the total budget for the Public Health Engineering Department in Swat District. Most of the budget for the Department is spent to provide water supply facilities which are not given priority in the improvement works for rural infrastructures. Although it is recognized that the better hygienic living conditions is important through sanitation facilities, sanitation works is poorly introduced at present. Based on the results of the inquiring survey conducted by JICA Study Team, it can be said that people's requirements on sanitation are not so serious as providing as other social infrastructures, such as roads, water supply, electricity supply, etc.

### 3.10.4. Social Welfare

According to the available data of Social Welfare Office, Swat, there are four government sponsored industrial training centers and 44 community sponsored various institutions such as Industrial Training Centre for Women, Religious Classes for boys, Commercial Training

Centre for boys and others in Swat District in 1988. Out of the 44 institutions, 40 institutions are located in Swat Sub-Division, three in Shangla Par Sub-Division and one in Buner Sub-Division. Most of them are concentrated in Swat Sub-Division at present. One of the important activities of those institutions is teaching handicrafts to women in order to increase the job opportunities for them. The majority of these institutions have been established and maintained by voluntary social welfare organizations. They are working on the self-help basis for each community. The government, however, gives them a little grant in aid which is not sufficient to carry out their activities effectively. Consequently, their activities are facing to much difficulties to become dull.

### 3.10.5. Communications

The present communication systems of post office, telegram and telephone offices in Swat District are summarized as follows depending on the statistical data in 1986.

#### 1) Post Offices

The number of post offices in the District is estimated at 106, of which one is the head post office in Saidu Sharif, 21 are the sub-post offices and 84 are the branch post offices. The branch post office services are managed by substitutes who are teachers, doctors and others in each area. In Swat District each post office, on average, serves an area of 74.2 sq.km and the population of about 14,000. According to the United Postal Union, the area and population served by the post offices should be between 20 to 60 sq.km and about 3,000 to 6,000 population. Consequently, the opening of about 100 new post offices will be required to reach the standard.

#### 2) Telegram Offices

In the District only two telegram offices are available, one in Saidu Sharif and the other in Mingora. However, there is no telegram office in rural area.

3) Telephones

There are three automatic relaying offices in Swat District, of which one in Saidu Sharif with 1,500 lines, and in Mingora with 1,000 lines and one in Daggar with 300 lines. The number of other relaying offices available is 36 in the District. The number of telephone unit available is estimated at 2,982 units of which 2,268 units are connected with the automatic relaying offices and 714 are with others. The population served by each telephone can be calculated at about 540. According to the results of the inquiring survey, about half of all the villages do not have telephone and direct dialing and increasing telephone lines are requested.

## 3.11. Tourism

### 1) Tourism Resources

In the period of Buddhism Civilization, Swat was well-known as Udyan, which means a garden or park, while during the time of the Great Alexander, Swat was known as "Sawatu"with the Swat river. The word "Sawatu" has been derived from the terms in "Swets", which means white. It well matches to the name of the Swat river, because of its crystal clean water. Tourism resources in Swat District, therefore, has been exploited with its history and beautiful scenery. The territory of Swat District ranges from about 1,000 m above sea level at its capital, Saidu Sharif, to the top of Falakser.

The Swat District is blessed with many tourism resources as fruitful orchards, meandering rivers, tumbling streams, Himalayan ranges, many other peaks for mountain climbers, pine forests for trekkers and ski-cum-summer resorts for those who are sports lovers (see Figure 3-7).

### 2) Main Tourism Routes 1/

The main tourist spots in Swat District can be listed as follows:

i) Buddists remains spreaded in near Saidu Sharif and over the southern par of the valley

ii) Golf course in Kabal

iii) Exciting tourist resort of great natural beauty at Miandam

iv) Madyan located on the heart of the upper Swat valley

v) Excellent valley for hiking at Bahrain

vi) Breath-taking view of snow - capped Mount Falakser 5,918 m and 6,096 m high peak at Kalam

vii) Exploring of sightseeing or brown trout fishing at valleys of Ushu, Utror and Gabral beyond Kalam

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1/ Japanese tourism agent exploits several routs, and one of them is "Silk Road Trip" which consists of the following routes; China - Karakuram Highway - Gilgit - Chilas - Saidu Sharif - Kalam - Peshawar - Rawalpindi - Islamabad.

3) Tourism Service Facilities and Tourist

There are reasonably comfortable hotels and motels in the area; two in Saidu Sharif, one in Marghuzar, five in Mingora, one in Bagh Dehri, two in Baharain, three in Madyan, three in Miandam and four in Kalam and plenty of adequately furnished and conveniently located cottages /hotes. Pakistan Tourism Development Corporation (PTDC) offers also motel accommodation in Miandam, Kalam and Besham. There are 28 resthouses managed by the Government. All the resthouses are equipped with crockery, cutlery and cooking facilities.

The number of tourists to have visited Swat, according to the Tourism Information Centre of the PTDC in Swat, are tabulated as follows:

| Year | Foreigner | Pakistani |
|---|---|---|
| | (person) | (person) |
| 1987 (Jan. -Dec.) | 3,940 | 4,502 |
| 1988 (Jan. - Oct.) | 3,385 | 5,272 |

4) Problems on Tourism Development

The tourist attraction will greatly contribute to the increase of revenue in Swat District and will increase in the local employment opportunities in the area. The Tourism Information Centre, Swat pointed out the following problems encountered at present;

i) A part of 28 resthouses requires a little renovation.

ii) During summer season, a number of tourists visit the Information Centre Office driving their big vans and cars. Although they want to go camping, there are not enough caravan parks.

iii) Youth hostel facilities for foreign and Pakistani tourists are required.

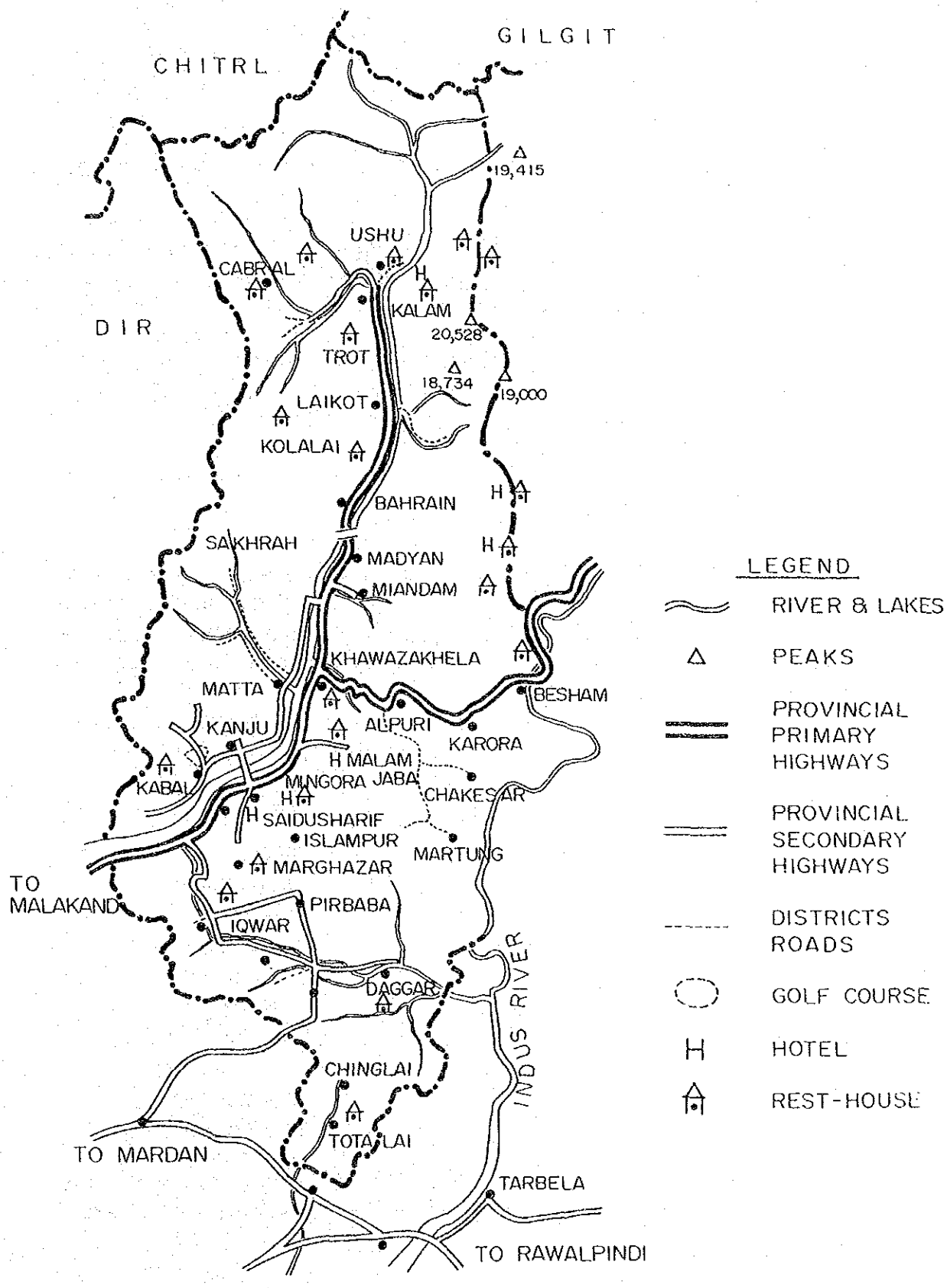
iv) Construction of a good and decent restaurant in Mingora, Malam Jabba, Gabral, Ushu and Matiltan at the upper part of the Swat valley are required for foreign tourists.

v) There is not a single decent toilet available in the area from Malakand Pass onward upto Kalam. Priority would be given to provision of the modern toilet in this area.

vi) The funds to preserve an archaeological remains and survivals are insufficient.

vii) New exploitation of tourism resources in Sakhrah valley is necessary in order to attract more tourists.

## FIGURE 3-7 TOURISM MAP IN SWAT DISTRICT



## 3.12. Inquiry Survey

### 3.12.1. Farm Economic Survey

#### 1) Objectives of Survey

The objectives of farm economic survey is to identify the following subjects;

i) The present family structure, employment, crop production, social conditions, domestic problems faced by farmers themselves and their families,

ii) Major community problems perceived by farmers,and

iii) Suggestion for the solution of such problems.

#### 2) Survey Method

The first step of the farm economic survey was to select sample village based on the village groups listed by Swat Regional Statistic Office in Mingora. The total number of the samples of 60 in 10 villages with six samples per village were chosen considering the short survey period. Sampled 10 villages are as shown follow.

Name of Sampled Villages

| Sub-Division | Union Council | Village Name |
|---|---|---|
| Swat | Malam Jabba | Sair |
| | Behrain | Zor-Kalai |
| | Khadukhel | Kotanai |
| | Hassan Khel | Kuz Dursh Khela |
| Shangla Par | Dandai | Mera |
| | Shahpur | Shahpur |
| | Puran | Aloch |
| | Martung | Martung |
| Buner | Karapa | Gagra |
| | Amazai | Ambela |

As the second step for selecting sample farmers, the size of land held by farmers was taken into consideration in the way that selected

ssamples should be small size and average size classes. The former size class is of less than 1.0ha (2.5 acre) and the letter is of 1.0 - 4.0 ha (2.5 - 10.0 acre). The large size classes of farmers holding the land more than 4.0 ha (10 acre) were excluded from the survey.

### 3) Results of the Survey

Farm economic survey has been conducted by the Institute of Development Studies, Agricultural University, Peshawar, from November to December 1988. Questionnaires are 24 samples in Swat Sub-Division, 24 samples in Shangla Par Sub-Division, and 12 samples in Buner Sub-Division. The results are interpreted using actual information collected from above 60 samples as follows;

Domestic Problems faced by Respondents

| | | Response |
|---|---|---|
| - Unemployment | : | 50 |
| - Lack of Finance | : | 40 |
| - Poor Health | : | 38 |
| - Housing Shortage | : | 21 |
| - No Problem | : | 2 |

Major Community Problem observed by Respondents

| | | |
|---|---|---|
| - Health & Sanitation | : | 51 |
| - Rural Electricity | : | 36 |
| - Education | : | 30 |
| - Communication | : | 25 |
| - Road Condition in Rainy Season | : | 19 |
| - Further Extension of Road | : | 18 |
| - Waterlogging | : | 14 |
| - Drainage | : | 8 |

Suggestion for the Solution of the Problems by Farmers

| | | |
|---|---|---|
| - Upgrading of School | : | 50 |
| - Irrigation Facilities | : | 40 |
| - Loan for Agricultural Inputs | : | 34 |
| - Electrification | : | 32 |
| - Road Improvement | : | 30 |
| - Water Tank Construction | : | 30 |
| - Dispensary Construction | : | 30 |
| - Drainage Improvement | : | 13 |

Future Plan in Aspect of Farm Management within Five Years

| | | | |
|---|---|---|---|
| - | Expansion of Crop Production | : | 58 |
| - | Expansion of Forest | : | 22 |
| - | Expansion of Animal Husbandry | : | 3 |
| - | Expansion of Fishery | : | 3 |

Farm Economy

- Average size of land in 60 sampled farmers is 1.78 ha (4.37 acres).
- About 21 percept of population of over 10 year-old is unemployed and under seeking employment.
- Land market is comparatively active. 15 farmers sold or purchased the fields during last one year.
- Outline of an average farm economy per annum is as follows;
  - Farm Income : Rs 8,236 (36%)
  - Non-farm Income : Rs 14,650 (64%)
  - Total : Rs 22,886 (100%)
  - Expenditure of Household : Rs 22,100 - 25,300 (average Rs 23,700)
  - Cultivated Land Value sold (average of samples farmlast one year) : Rs 14,270
  - Total value sold for 15 farmers: Rs 856,000/13,385 acres

### 3.12.2. Inquiry Survey for Union Council Level

#### 1) Objectives of Survey

The inquiry survey for Union Council (UC) level aims at identifying the grass-root people's needs on those items such as agricultural and socio-economic development and improvement.

2) Survey Item

The survey items can be divided into two parts, Part I and Part II. Part I is inquiry survey for the Union Councilor to choose ten most required items from 60 items. Part II is the rural infrastructure aspects such as road, post and telephone, water supply, health, sanitation, education, social welfare facilities and electrification.

3) Survey Method

The JICA Study Team requested the Local Government and Rural Development (LG & RD) Department, Swat to carry out the said survey. On November 12, 1988, LG & RD Department called the Secretaries of 69 UCs to answer the questionnaires prepared by JICA Study Team.

4) Collection of Answers to Questionnaires

Out of 69 UCs, 66 UCs by about 96 percent responded the questionnaires. They include 35 UC in Swat, 15 UCs in Shangla Par, and 19 UCs in Buner Sub-Divisions. These UCs chose ten items of the most requirements having the multiple contents of four categories of improvement, new development, more increase and upgrading.

5) *Information Collected on Part I Survey (General Inquiry Survey)*

The answers to the development requirements are different by Sub-Divisions. As each Sub-Division is located under different topographical, agro-climatical and socio-economical environment, the development requirements are not the same. Therefore, the answers should be studied on the basis of classified Zone. Table 3-7 shows the zoning of Sub-Tehsil and UCs. The 60 items of requirements by the questionnaire are classified by development themes of 18 subjects. Table 3-8 shows the detail of development requirements in each Zone.

The development themes mentioned above are roughly classified into three categories of agriculture, rural life and rural industry. The itemized ratio of the answers with the high priorities to total number of UCs is estimated in each category. As the results of study, an intensity of development requirements by Sub-Division is different as shown in Table 3-8.

Intensity of Development Requirements

| Development Themes | Swat | Shangla Par | Buner |
|---|---|---|---|
| Agriculture | Higher than others | Lower than rural life | Higher than rural life |
| Rural Life | Higher than others | Higher than agriculture | Lower than agriculture |
| Rural Industry | Higher than others | Lower than Swat | Lower than Swat |

The results of analysis on Part I survey are summarized as follows:

- The major requirements in six items such as irrigation, road, electrification, village water supply, health and education are shown in Table 3-9, in which such requirements are classified into four categories, namely, improvement, new development, more increase and up-grading.
- The requirements of Swat Sub-Division cover all categories of the project works. This fact can be considered that Swat Sub-Division is the relatively developed area in view of the agricultural and social infrastructure in comparison with that in other two Sub-Divisions.
- Shangla Par Sub-Division, especially Zone VI, requires a number of new project works.
- Irrigation works required by Buner Sub-Division are of new schemes.

6) Results of Part II Survey (Rural Infrastructure Aspects)

The results on Part II survey are totaled based on the number of facilities such as road, post, telephone, village water supply, health, sanitation, school, community facilities and electrification as shown in Table 3-10. These figures are surveyed based on all the requirements apart from the priority in Part I survey.

### 3.12.3. Village Profile Survey

1) Objectives of Survey

The village profile survey aims at collection of the updated figures and information on socio-economic and agricultural situation and requirements on rural infrastructure.

2) Survey Items

The survey items are population, land area, farm household, livestock, road, village water supply, health, education, electrification, and irrigation.

3) Survey Methods

LG & RD Department in Swat was requested to carry out the survey in the same manner as the inquiry survey for the UC level. Although the number of villages in Swat District is 1,695 according to the information of LG & RD Department, Swat, the actual village profile survey was conducted in 541 wards which control several terminal villagers

4) Collection of Questionnaire

Out of 539 wards, 509 wards responded the questionnaire, and the response rate is 94 percent. The responded number in each Sub-Division is as follows;

Number of Wards Responded

| Sub-Division | No. of UC | No. of Wards | No. of Wards responded |
|---|---|---|---|
| Swat | 35 | 296 | 296 |
| Shangla Par | 15 | 119 | 119 |
| Buner | 19 | 124 | 94 |
| Total | 69 | 539 | 509 |

TABLE 3-7 LIST OF SUB-DIVISION WISED TEHSIL/SUB-TEHSIL AND UNION COUNCIL

| Sub - Division | Zone | Tehsil / Sub - Tehsil | Union Council |
|---|---|---|---|
| Swat | I | Kalam | 1. Utror l'Kalam |
| | | Bahrain | 2. Balakot 3. Bahrain 4. Madyan 5. Chail Shahgram |
| | II | Matta | 8. Mohammad Khel 9. Merokhel 10. Sinakhel 11. Behlolkhel Matta 12. Mullahkhel No. 2 13. Hassan Khel 14. Mullahkhel No.1 15. Nazar Khel |
| | | Khawazakhela | 6. Fatehpur 7. Barhampattai 32. Khadukhel 33. Barakhel Marli Khel |
| | | Charbagh | 16. Gulibagh 17. Malam Jabba 18. Charbagh |
| | III | Kanju | 19. Bar Attia Ningolai 20. Kuz Attia Ningolai 21. Sahibkhel |
| | | Kabal | 22. Shah Dherai 23. Totano Bandai 24. Abakhel Kabal |
| | | Barikot | 25. Shamozai 26. Abakhel Baricot 27. Musakhel Kota |
| | | Mingora | 28. Abakhel Quamber 28. Barath Khel Odigram 29. Kokarai 30. Akamaro Bamikjel 31. Islampur |
| Shangla Par | IV | Alupri | 9. Bar Ghurband 10. Kuz Ghurband 11. Kuzkana 12. Berkana 13. Pirkana 14. Lilonai 15. Shahpur |
| | V | Chakesar | 4. Kur Pam Chakesar 5. Bar Pam Chakesar |
| | | Puran | 2. Makhozai 3. Puran |
| | | Martung | 1. Martung 8. Behlol Khel |
| | VI | Besham | 6. Dandai 7. Besham |
| Buner | VII | Daggar | 9. Klai 10. Karapa 11. Daggar 12. Torwarsak |
| | | Gadezai | 13. Malaikher 14. Gadezai 15. Abakhel Salarzi |
| | | Gaggra | 6. Norezai 7. Bajkata 8. Gagra |
| | | Chagharzai | 17. Batara 17. Gul Bandai 18. Sorai 19. Bandir |
| | VIII | Chamla/Amazai | 2. Amazai 17. Nawagai 5. Chamla |
| | IX | Khidukhel | 1. Totalai 4. Khudukhel |

TABLE 3-8 DETAILS OF DEVELOPMENT NEEDS OF UC BY ZONE

(Unit: Number of UC)

| Development Theme | Needs | Swat Zone I | Swat Zone II | Swat Zone III | Swat Total | Shangla Par Zone IV | Shangla Par Zone V | Shangla Par Zone VI | Shangla Par Total | Buner Zone VII | Buner Zone VIII | Buner Zone IX | Buner Total | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Agricultural Infrastructure | Irrigation | 8 | 18 | 12 | 38 | 4 | 1 | 2 | 7 | 10 | 1 | 3 | 14 | 59 |
| | Drainage | 1 | 1 | 4 | 6 | 2 | 1 | 1 | 4 | 4 | – | 2 | 6 | 16 |
| | Water Resources | 1 | 2 | 1 | 4 | – | – | – | – | 1 | – | – | 1 | 5 |
| | Land Consolidation | 1 | – | – | 1 | – | 1 | – | 1 | 3 | – | – | 3 | 5 |
| 2. Vacant Land | Pasture Land | 2 | – | – | 2 | – | – | – | – | – | – | – | – | 2 |
| | Orchard | – | – | – | – | – | – | – | – | – | 1 | – | 1 | 1 |
| 3. Farm Land / Forest Land Conservation | Protection of Soil Erosion | 2 | – | – | 2 | 1 | – | – | 1 | – | – | – | – | 3 |
| 4. Agricultural Modernization | Seedling: Fruits | 1 | – | 2 | 3 | 3 | 1 | – | 4 | 1 | – | – | 1 | 8 |
| | & Nursery Vegetable | 1 | – | – | 1 | – | – | – | – | 1 | – | – | 1 | 2 |
| | Afforestation | – | 2 | – | 2 | 5 | 1 | 1 | 7 | 3 | – | 2 | 5 | 14 |
| | Fodder Tree | 1 | 1 | – | 2 | 1 | – | – | 1 | 1 | – | – | 1 | 4 |
| | Flower | – | – | – | – | – | – | – | – | – | – | – | – | – |
| | Vegetable Grow Facility | 3 | 1 | – | 4 | – | – | – | – | 3 | – | – | 3 | 7 |
| | Forticultural Facility | – | – | – | – | – | – | – | – | – | – | – | – | – |
| | Agri. Machinery | 3 | 6 | 4 | 13 | 5 | – | 1 | 6 | 6 | 1 | 2 | 9 | 28 |
| 5. Livestock Development | Poultry Farm | – | 5 | 1 | 6 | 2 | – | 2 | 4 | 5 | 1 | – | 5 | 16 |
| | Young Cows / Buffalos | – | 4 | 2 | 6 | 4 | 1 | 1 | 6 | – | – | – | – | 12 |
| | Young Goats | 1 | – | – | 1 | 1 | 1 | – | 2 | – | – | – | – | 3 |
| | Bee-Keeping | 2 | 1 | – | 3 | – | – | – | – | – | – | – | – | 3 |
| | Young Poultry Birds | – | – | – | – | – | – | 1 | 1 | – | – | – | – | 1 |
| | Veterinary Center | 3 | 6 | 8 | 17 | 5 | 5 | | 10 | 4 | – | – | 4 | 31 |
| 6. Agricultural Extension | Technical: Agriculture | – | 1 | 1 | 2 | – | 1 | – | 1 | 3 | – | – | 3 | 6 |
| | Guidance: Horticulture | 1 | – | – | 1 | – | – | – | – | 2 | – | – | 2 | 3 |
| | Agri. Extension Service | 2 | – | – | 2 | 1 | – | – | 1 | – | – | – | – | 3 |
| 7. Farmers Organization | Agri. Cooperative Associ. | 6 | 1 | 1 | 8 | – | – | – | – | 1 | – | – | 1 | 9 |
| | Irrigation Association | – | – | – | – | – | – | – | – | – | – | – | – | – |
| 8. Agriculture Credit | Loan for Agri. Inputs | 6 | 8 | 4 | 18 | 1 | 4 | 1 | 6 | 8 | – | 1 | 9 | 33 |
| 9. Marketing Facility | Fruits, Vegetable & Flower | 3 | – | – | 3 | 1 | – | – | 1 | 2 | – | – | 2 | 6 |
| | Storage for Products, Inputs | 2 | – | 1 | 3 | – | – | – | – | – | – | – | – | 3 |
| | Suzuki Trucks | – | – | – | – | – | 1 | 1 | 2 | – | – | – | – | 2 |
| | Cold Storage | – | – | – | – | – | – | – | – | – | – | – | – | – |
| | Slaughterhouse | 3 | 3 | 2 | 8 | – | – | – | – | – | – | – | – | 8 |
| | Direct Sales Shop | 1 | 1 | – | 2 | 1 | – | – | 1 | 2 | – | – | 2 | 5 |
| 10. Small Industry | Processing Plant, Agri Prod. | – | – | – | – | 1 | – | – | 1 | – | – | – | – | 1 |
| | Flour Mill | 1 | 5 | 1 | 7 | 1 | 1 | 1 | 3 | 2 | 1 | 1 | 4 | 14 |
| | Woodworking Plant | 4 | 3 | 3 | 10 | 1 | 1 | 1 | 3 | – | – | – | – | 13 |
| | Charcoal Ball & Brick Fact. | – | – | – | – | – | – | – | – | – | – | – | – | – |
| | Cooperative: Textili & Workshop Handicraft | 2 | 1 | – | 3 | – | 1 | – | 1 | – | – | – | – | 4 |
| | Agri. Mchinery | – | – | – | – | – | – | – | – | 1 | – | – | 1 | 1 |
| 11. Fishery | Fish Hatchery | – | 1 | – | 1 | – | – | – | – | – | – | – | – | 1 |
| | Fish Pond | – | – | – | – | – | – | – | – | – | – | – | – | – |
| 12. Electrification | Electricity | 8 | 12 | 8 | 28 | 3 | 6 | 1 | 10 | 9 | 1 | 2 | 12 | 50 |
| 13. Water Supply & Sewerage | Well (Shallow, Tube) | – | 4 | 2 | 6 | – | – | – | – | 5 | – | – | 5 | 11 |
| | Water Supply System | 5 | 9 | 8 | 22 | 3 | 2 | – | 5 | 6 | 3 | – | 9 | 36 |
| | Sewerage | – | – | – | – | – | – | – | – | – | – | – | – | – |
| 14. Health | Health Centre | 5 | 10 | 16 | 31 | 5 | 5 | – | 11 | 10 | 2 | 2 | 14 | 56 |
| | Vehicles for Patients | 3 | 2 | 4 | 9 | 3 | – | – | 3 | 2 | – | – | 2 | 14 |
| 15. Education | School (Prima, Middle High) | 4 | 15 | 11 | 30 | 5 | 8 | – | 13 | 3 | 4 | 4 | 11 | 54 |
| | Nursery (Children) | 1 | 2 | 1 | 4 | 2 | 2 | – | 3 | – | – | – | – | 7 |
| 16. Transportation | Katcha (Farm to Market) | 4 | 10 | 10 | 24 | 8 | 6 | 2 | 16 | 5 | – | – | 5 | 45 |
| | Bridge | 5 | 5 | 9 | 19 | 4 | 3 | 1 | 8 | 2 | 2 | 2 | 6 | 33 |
| | Buildozer | – | 5 | 5 | 10 | 1 | 3 | 2 | 6 | 6 | 1 | 2 | 9 | 25 |
| | Traffic Signal, Mark Facilities | – | – | – | – | – | – | – | – | – | – | – | – | – |
| 17. Communication | Post Box & Office | 3 | 4 | 7 | 14 | 1 | 2 | – | 3 | 5 | – | – | 5 | 22 |
| | Public Telephone | 2 | 8 | 9 | 19 | 4 | 3 | – | 7 | 6 | – | – | 6 | 32 |
| | Telegram | 1 | 1 | 2 | 4 | – | – | – | – | 2 | – | – | 2 | 6 |
| | Cableway, Ropeway | – | 1 | 1 | 2 | – | 1 | – | 1 | – | – | – | – | 3 |
| | Community Centre | – | – | – | – | – | – | – | – | – | – | – | – | – |
| 18. Fire Prevention Security System | Small Water Tank Lorry for Fire & Drink | 1 | 4 | 1 | 6 | – | – | – | – | 3 | – | – | 3 | 9 |

TABLE 3-9 CATEGORY-WISE REQUIREMENTS

(Unit: Number of UC responded)

| Requirement | Category | Swat Zone I | Swat Zone II | Swat Zone III | Shangla Par Zone IV | Shangla Par Zone V | Shangla Par Zone VI | Buner Zone VII | Buner Zone VIII | Buner Zone IX |
|---|---|---|---|---|---|---|---|---|---|---|
| Irrigation | 1 | 2 | 1 | 2 | 1 | 1 | 0 | 0 | 0 | 0 |
| | 2 | 3 | 6 | 4 | 3 | 0 | 2 | 9 | 2 | 2 |
| | 3 | 3 | 5 | 2 | 0 | 0 | 0 | 1 | 0 | 1 |
| | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Road (Katcha) | 1 | 0 | 1 | 1 | - | 1 | 0 | 1 | 0 | 0 |
| | 2 | 1 | 4 | 8 | 5 | 5 | 2 | 4 | 0 | 0 |
| | 3 | 3 | 4 | 1 | 2 | 0 | 0 | 0 | 0 | 0 |
| | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Electrification | 1 | 2 | 1 | 2 | 1 | 0 | 1 | 2 | 0 | 0 |
| | 2 | 3 | 5 | 4 | 1 | 5 | 0 | 4 | 1 | 2 |
| | 3 | 3 | 5 | 2 | 1 | 0 | 0 | 3 | 0 | 0 |
| | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Water Supply System | 1 | 2 | 3 | 2 | 0 | 0 | 1 | 0 | 1 | 0 |
| | 2 | 3 | 3 | 5 | 2 | 6 | 0 | 5 | 1 | 0 |
| | 3 | 0 | 3 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Health Centre | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| | 2 | 2 | 11 | 8 | 5 | 5 | 1 | 8 | 1 | 0 |
| | 3 | 1 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Education (Primary, Middle, High School) | 1 | 1 | 3 | 2 | 0 | 1 | 0 | 0 | 1 | 0 |
| | 2 | 0 | 4 | 8 | 4 | 3 | 0 | 3 | 1 | 1 |
| | 3 | 2 | 7 | 1 | 1 | 3 | 0 | 0 | 1 | 2 |
| | 4 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |

Note: Category: 1. Improvement
2. New Development
3. More Increase
4. Up-grading

Figures include multiply answers.

TABLE 3-10 PART-II RURAL INFRASTRUCTURE ASPECTS

(Unit: Number of facilities required)

| Item | | Swat | Shangla Par | | Buner |
|---|---|---|---|---|---|
| Road | | | | | |
| Construction | | 23 | 4 | | 8 |
| Improvement | | 22 | 8 | | 9 |
| Pavement | | 15 | - | | 4 |
| Drainage | | 12 | 5 | | 3 |
| Bridges | | 21 | 9 | | 7 |
| Post, Telephone | | | | | |
| Post Offices | | 7 | 3 | | 8 |
| Telephone Office | | 17 | 3 | | 1 |
| Telegram Office | | 4 | - | | 6 |
| Water Supply | | | | | |
| Well with Bucket | | 11 | - | | 3 |
| Well with Pump | | 12 | 2 | | 3 |
| Distribution System | | 16 | 5 | | 2 |
| Others | Water Supply System | 9 | Taps 1 | Water Supply System | 1 |
| Health | | | | | |
| BHU | | 17 | 9 | | 5 |
| RHC | | 11 | 2 | | 2 |
| Dispensary | | 7 | 3 | | 2 |
| Hospital | | 5 | 1 | | 1 |
| Doctor | | 9 | 8 | | 2 |
| Midwife | | 8 | 5 | | 2 |
| Sanitation | | | | | |
| Temporatry Pit | | 12 | 3 | | - |
| Pit/Bucket Latrine | | 8 | 4 | | 1 |
| Water Flush | | 11 | 4 | | 1 |
| Not Water Flush | | 8 | 1 | | - |
| Schools | | | | | |
| Class Room | | 26 | 13 | | 11 |
| Play Field | | 28 | 13 | | 10 |
| Drinking Water | | 23 | 11 | | 9 |
| Toilet | | 25 | 11 | | 7 |
| Others | Girls High School | 3 | - | Girls High S. | 2 |
| | | | | Boys High S. | 1 |
| | Boys High School | 1 | | Primary S. | 1 |
| | College | 1 | | College | 1 |
| Community Facilities | | | | | |
| Community | | 19 | 3 | | 6 |
| Mosque | | 15 | 2 | | 5 |
| Recreation | | 17 | 4 | | 3 |
| Others | | 2 | - | | - |
| Electrification | | | | | |
| Partially | | 27 | 3 | | 6 |
| Not | | 5 | 10 | | 8 |

## 3.13. Development Problems

### 3.13.1. Natural Resources

#### 1) Land Resources

From the view point of the land resources extending in Swat District, the followings are pointed out as problems and restricting factors for development;

- There exists a limited flat land to be used for crop cultivation, that is, high mountain areas with steep slope and glacier and exposed rocks in a part are predominant the District.
- The soil layers of these mountainous area are generally found shallow due to severe soil erosion on the steep slope. Especially, the mountainous areas consisting of metamorphic rock are not suitable for even forests due to shallow soil layers, which are presently covered with shrubs and grasses and used for grazing cattle and sheep.
- Under these conditions, in order to meet urgent requirements of food for the increasing population in the rural area, the local people have been expanding cultivation fields in the narrow terraced not only at relatively gentle slope areas but also at the steep slope area of the mountains. These terraced fields are remarkably observed in Shangla Par Sub-Division, in which flat land exists very scarcely.
- The aforesaid over development of farm land in the mountain areas has caused reduction of forest in acreage to result in serious social problems of soil erosion in the related watershed as well as decrease in the water holding capacity of the land.

#### 2) Water Resources

##### a) Surface Water

There exist perennial and intermittent rivers in the Project Area, and the seasonal fluctuation of their discharge is extremely large, and this has brought about many problems and restrictions in the development and utilization of the water resources as explained below.

The major river systems in the Project Area are;

- Swat Sub-Division:
  Mainstream of Swat river, and chief tributaries such as Deolai, Harnoi and Barwai Khwars
- Shangla Par Sub-Division:
  Khan Khwar and Itai Khwar
- Buner Sub-Division:
  Barandu river, Chamla Khwar and Badri Khwar

Swat Sub-Division

The main stream of the Swat river has enough amount of discharge for large scale development. Annually, about 3,000 MCM of water is flow uselessly in a conservative estimation. This is the potential water for new utilization. However, it is necessary to make peak-cut and periodical balance of the discharge. Otherwise, it is quite difficult to use the water effectively in the present situation. And, problems and restrictions shall be solved, and these problems are caused by the topographical and geological aspects, high construction cost, disappearance of existing social capitals and properties under water.

In the development of the tributaries to cope with the larger seasonal fluctuation, the river protection is required for flood control and land conservation as well as the installation of stable water intake facilities (head regulators). It is also important to observe the river discharge to grasp the quantity available for water utilization.

Shangla Par Sub-Division

The Khan Khwar has relatively large discharge to install the micro hydel-power plant in similar scale to that is commissioned now in Damori and Karora. The Itai Khwar has less discharge in the dry season than in the wet season.

There are very severe restrictions and difficulties for the water resources development due to the same events as found above in Swat Sub-Division.

The terrace farms developed on the hillside can be irrigated by installation of small scale water intakes followed by the conveyance canals in the Khan and Itai Khwars.

Buner Sub-Division

The land and rivers are more gentle than those in other two Sub-Divisions. There are not deep back mountainous areas in the watershed. The lower parts of catchment area form the beneficial area of the development scheme.

The basin is poor in natural surface water. Therefore, a large amount of water flows out in short period and the discharge becomes small in the dry season. This makes it quite difficult to take in the water more than that of present use even though the head regulator is installed. However, the surface water penetrates into groundwater in the well-developed alluvial fans.

Intermittent Rivers in Three Sub-Divisions

It is possible to use the water which is taken in and stored in small dams, when the intermittent river is flooded due to Rabi season rainfall and Kharif monsoon rainfall. However, the river protection works are required at first to prevent the farmland from flood.

b) Groundwater

Since the seasonal fluctuation is small, the groundwater is one of the easiest water sources to be utilized if the cost problem can be conquered.

In Swat and Buner Sub-Divisions, the potentiality of groundwater development is very high at the alluvial fans which widely extend on both banks of the Swat and Barandu rivers. If the groundwater is to be developed in large scale, it is required first to make review of the results and data obtained through the previous investigations and studies in order to grasp the existing quantity, quality, aquifer condition and short and long term movement etc. of the groundwater.

In other respect, the large scale development of groundwater is not feasible in the Khan Khwar basin because the groundwater must be extracted from the nallow aquifer, fault and fracture zones locally existing

in the mountainous area. However, further investigation is necessary to find the possibility of the tube-well irrigation scheme in Aloch and Martung in the Itai Khwar basin.

### 3.13.2. Employment and Farm Economy

According to the statistics of the employment population and employment opportunity, 81 percent of employment population is engaged in agriculture, livestock farming and forestry, nine percent for the related agricultural production, and three percent in the business activities.

According to the Population Census in 1981, working population is about 324 thousand, and the people looking for job are about 15 thousand, and these are equivalent to 40.4 and 2 percents of the total people of about 802 thousand with the age of 10 years and above.

Recently, however, the job hunters have shown an increasing trend in number, and most of these jobless are the sons of the farmers with the average scale in land holding or the smaller. In the contrary, those who have the large scale farm land can do well balanced farm management with their products together with a variety of other business lines such as groceries, transportation with pick-up trucks and minibuses, so that their sons can have working opportunities very easily.

The problems arising from employment for the farmer in the Project Area are the difficulty in self-sufficient of agricultural production and in income increase of the small farmers. Especially, the farmers belonging to the area of Barani farming are working away from home to big cities or towns for five to six months a year, usually from November to March in winter season, and such farmers are about a half of the small farmers. Such major towns are mostly outside of Swat, as Peshawar, Rawalpindi, Lahore and Karachi. There are some farmers who go far to the Middle East.

The problems of the farm economy are a small share of annual farm income of about Rs 8,200, while an average annual expenditure is about Rs 22,100 to Rs 25,300. And other income depends wholly on the seasonal non-farm income of about Rs 14,650 by householder themselves or their sons. Under such situation, it can be considered that agricultural productivity of the farm households is low and the farmers are obliged to

obtain non-farm income. The details of farm income and family expenditure are shown as follows;

Farm Income and Family Expenditure

| Item | Maize | Wheat | Vege-tables | Fruits | Others | Total | Non-farm Income | Total |
|---|---|---|---|---|---|---|---|---|
| Farm Income (Rs/year) | 1,945 | 2,088 | 2,566 | 125 | 1,512 | 8,236 | 14,650 | 22,866 |

| Item | Cereal | Other Foods | Fuel, Material | Clothing | Education | Health and Other | Total |
|---|---|---|---|---|---|---|---|
| Family Expenditure (Rs/year) | 6,530 | 4,410 | 3,410 | 2,650 | 2,060 | 4,640 | 23,700 |
| % | 27.5 | 18.6 | 14.4 | 11.2 | 8.7 | 19.6 | 100 |

According to the results of farm economic survey, the expenditure of food stuffs ranks first with large expense by Rs 10,940, while the total living cost is Rs 23,700. Out of the expenditure of the food stuffs, about 40 percent is occupied by the expense of other food stuffs. Other expenditures are shared by fuel and fire woods, electricity, water supply, etc., and their rates are Rs 3,410 (14%), Rs 2,650 (11%) and Rs 4,640 (20%), respectively.

### 3.13.3. Agriculture and Forestry

#### 1) Agriculture

#### a) Problems

The problems on agriculture are as follows;

Inadequate Agricultural Experiment

- There is no permanent experimental institution to cover the high altitude agriculture.
- Regarding the Mingora Research Station, the lack of staff (about 50 percent of sanctioned posts are vacant) and

experimental resources like experimental sites and equipment limit their activities. A wide range of agricultural environments in the area requires various kinds of research.

Insufficient Agricultural Extension

- The agricultural extension services are quite inadequately extended especially in the mountainous areas because of the understaffing of extension staff on the basis of the natural standard and the insufficient facilities of extension building and transportation.

- Various adaptive researches and on-farm demonstrations are also required on different agro-enviromental conditions, but no organization to conduct such activities exists.

- Soil and land classification maps are basically needed for the improvement of soil management and fertilizer application. However, these maps are not available.

- The audio-visual aids are not available.

- There are no organizations for training of extension staff and farmers' leaders in Swat District.

Shortage of Veterinary and Extension Facilities

- The veterinary hospitals / dispensary and artificial insemination facilities etc. are very limited in the mountainous areas.

- No institutional establishment for animal husbandry extension services is made in the District.

- There is no poultry hatchery facilities to produce cockerel and chicks for distribution.

Poor Seeds Multiplication Facilities

- The shortage of quality seed supply is very severe because no seeds multiplication facilities exist.

Poor Organization for Promotion of Soil Conservation Schemes

- There is poor organization for soil conservation schemes having no coordination body among agricultural suppporting organizations.

b) Constraint

Constraint for the agricultural development in the Project Area are as follows;

Limited Water and Land Resources

The steep mountain topography limits not only the development of such agricultural infrastructure as irrigation and farm road but also various agricultural supporting activities and marketing of agricultural products.

Limited Financial Capacity and Human Resources

The limited financial capacity restricts the proper institutional development of research and extension. More over it will take much time to raise the capacity of researchers and extension staff.

Poor Coordination of Agricultural Supporting

The coordination among the agricultural supporting organizations is urgently needed for the integrated development of soil conservation - crop production - animal husbandry.

2) Forestry

The major problems on the forestry in Swat District are summarized as below;

- In such mountainous areas mostly with poor access such as Shangla Par Sub-Division, the local people depends on agriculture, although its cultivated land per household is small in size, for instance, not more than one hectare. In such

areas with low crop yield due to limited irrigation water and a little application of fertilizers, the local people also depends largely on grazing of animals in the range land and in the forests.

- In the southern part of the Buner Sub-Division, there are many Afghani refugees with a number of animals, and the range land which has been heavily over-grazed by cattle, sheep goats, and camels have already reached a considerable conditions of extreme impoverishment and are mostly barren after eroded.
- As mentioned above, it is considered that the forests have fundamental living conditions for the local people. However, the increasing pressure of grazing, lopping of branches for fuel and illegal timber cutting are endangering more and more the existence of these forests on the other hand. Consequently, the development strategy for the use and management of the forests should be formulated considering more needs of local people, and the forests should be used as a base to install the infrastructure as well as in the wood-industry by creating employment opportunities in the forest areas.
- Under these situations, it is considered that following concept should be taken into account for the development of forestry in the area.
    - Various forest development schemes have been proposed and presently conducted by the Forest Department in NWEP with the foreign assistance as shown below, and therefore, forest development in the mountainous area will be based on these schemes in the Project Area.
        * Kalam Integrated Rural Development Project
        * Buner Development Project
        * Income Generating Project in Buner
        * Watershed Management and Forest Extension Project in Dir-Swat District
        * Afforestation of Kota and Abuha Hills
        * Afforestation and Soil Conservation in Hilly Tract of Malakand Division

* Afforestation in Forest Blank in Alpuri Forest Division

° Therefore, afforestation plan around the villages or housing aiming at grazing the animals, lopping of branches for fuel and soil conservation of terraced farmland should be introduced in the Project.

### 3.13.4. Rural Infrastructure

#### 1) Problems

The problems of the present living conditions in the rural area are summarized subsequently from the view point of rural infrastructures.

Road Condition

- The overall road networks have not completed yet, and consequently, the traffic is concentrated to the existing main roads which are not well-maintained for safe driving.
- Most of the branch roads are not paved, and their laybys and culverts are not fairly maintained. And, it is difficult to secure safe in local traffic.
- In Upper Swat area and Shangla Par Sub-Division, the road density is very low due to the topography of the mountains.

Electricity Supply

- In the mountainous area electricity supply must depend upon costly hydel power due to lack of WAPDA network.
- Health care, education and household matters are very limited due to lack of electricity.
- It is difficult to introduce lift pumps for irrigation and village water supply schemes.

Water Supply Facilities

- Absence of water supply facilities has compelled girls and women to do hard works of fetching drinking water. It takes them away from the opportunities of attending school and other meetings.

- It is necessary to introduce lift pumps to expand the benefited area of water supply facilities.

Schools and Teachers

- The education facilities are poor, and there is shortage of classrooms and materials.
- The shortage of teaching staff is very serious, especially for the girls' schools.

Health Facilities and Shortage of Doctors

- The existing health care facilities are not operated properly due to lack of basic infrastructure, such as electricity, water supply and others.
- The deployment of doctors for every clinics including female doctors is strongly requested.

Sanitation Facilities

- The rural people have less attention to sanitation than other kinds of infrastructures.
- Implementation body of sanitation schemes should be strengthened.

Social Welfare Facilities (Vocational Training)

- The governmental assistance is not sufficient especially to rural area.

Communication

- The present telephone networks cover only a half of UCs in Swat District.

2) Constraints

Constraints to the development of social infrastructures in Swat District is summarized as follows;

Topography

The steep mountainous topography restricts the development of roads, electricity, and others due to comparatively high construction cost.

Basic Infrastructure

The present improper rural infrastructure of roads, electricity, and others limits the social and economic activities in the rural area.

Human Factors

The shortage of staff in health care and education is very serious. The strengthening of training system in these fields is urgently needed on national and provincial levels.

# CHAPTER IV. BASIC CONCEPT FOR DEVELOPMENT PROGRAMMES

# CHAPTER IV. BASIC CONCEPT FOR DEVELOPMENT PROGRAMMES

## 4.1. Overview of District-Wise Regional Development Plan

District-wise development plans in the various sectors have been formulated and implemented by the related Government agencies concerned in Swat District. These development plans could be categorized into two types; that is, i) development with foreign aid and ii) development by local programme.

- Development with Foreign Aid
  The development with foreign aid includes nine projects as shown in figure 4-1 and Table 4-1.
- Development with Local Programme
  The projects by sectors concerned with this Master Plan Study are classified as shown in Table 4-2.

## 4.2. Development Strategies and Targets

### 4.2.1. Development Strategies

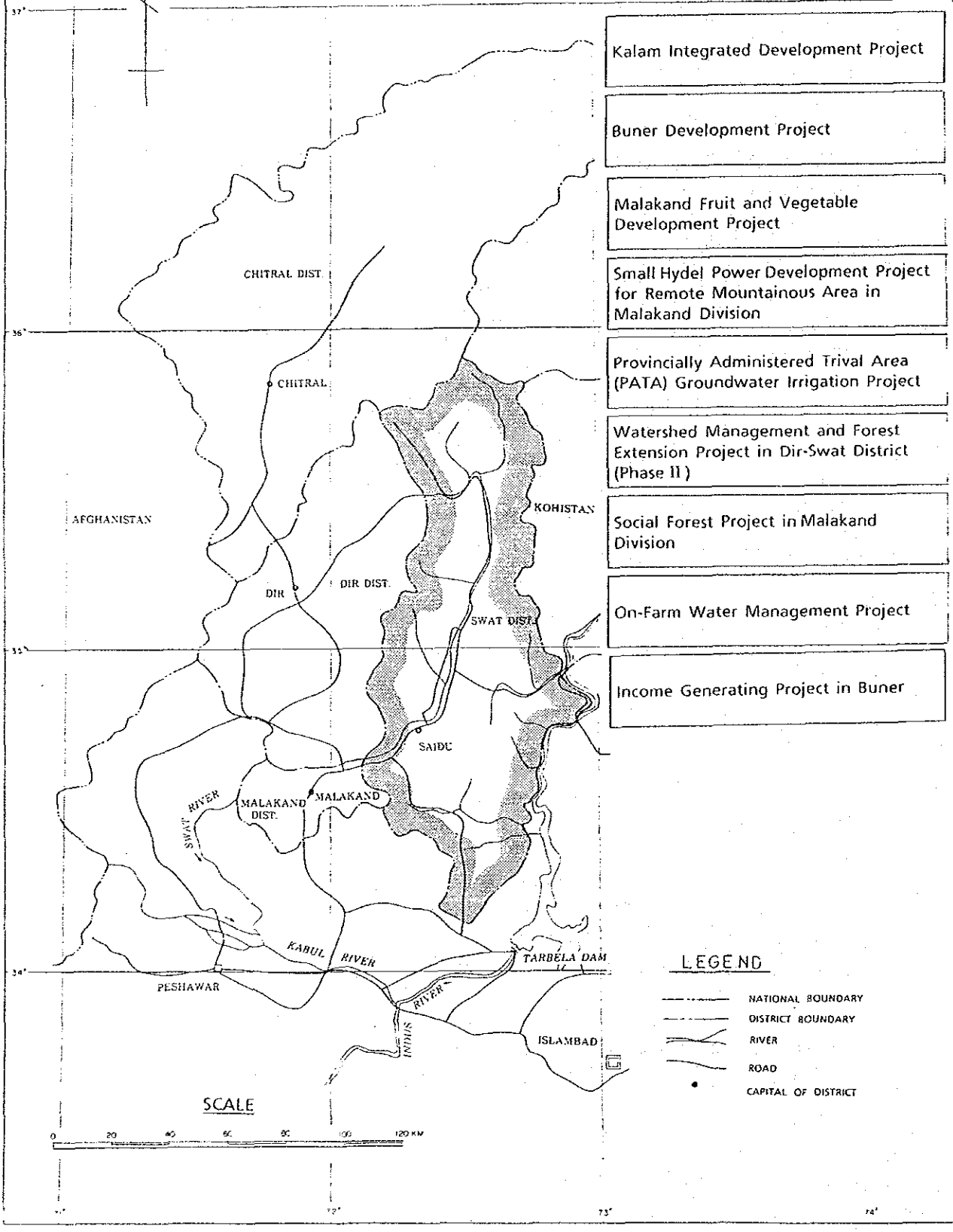
1) Objectives and Strategy

The Seventh Five - Year Plan (1988-1993) states about five main national objectives, among which the Government of Pakistan emphasizes the development of the rural area by the title of "to implement a concrete programme of poverty alleviation, especially in the rural areas to attain full employment and to ensure continued growth with stability".

Actually, in Swat District in NWFP, the local people living in the remote rural area have been exposed to unfavourable conditions as low productivity of crops, low income and very harsh living environment as compared with the other rural areas in Pakistan.

In the project plan, the following two development strategies are proposed so as to expect that poverty can be driven away from these frontier rural areas and to ensure the stable rural community;

# FIGURE 4-1 ON-GOING DEVELOPMENT SCHEMES ASSISTED BY FOREIGN AND IN MALAKAND DIVISION



# TABLE 4-1 ON-GOING DEVELOPMENT SCHEMES ASSISTED BY FOREIGN AID

| Project Name | Location | Project Period | Capital Cost (million Rs) | Project Works | Agencies Concerned |
|---|---|---|---|---|---|
| Buner Development Project | Buner Sub-Div. | 4 Years (Jan.1988 - Dec. 1991) | LC: 236.5<br>FC: 63.7(EC Aid)<br>Total 300.2 | 1.Agriculture<br>- Research Extension<br>- Seed Multiplication<br>- Land Leveling<br>- Livestock Development<br>2.Irrigation<br>- New Irrigation Scheme<br>3.Forestry<br>- Afforestation, Nursery<br>4.Geological Survey<br>5.Marble Development<br>6.Road Construction<br>7.Drinking Water Supply | Sponsor;<br>P&D Dept.NWFP<br>MOA,Pakistan<br>Construction;<br>Irrigation Dept.<br>Communication Dept.<br>O & M;<br>P&D Dept.NWFP through various Nation Building Department |
| Kalam Integrated Development Project (Phase III) | Kalam & Bahrai Tehsil, Swat Sub-Div. | 5 Years July 1987 - June 1992 | LC: 28.90<br>FC: 14.53<br>(Switzerland Aid)<br>Total 43.43 | 1.Forestry<br>- Extension Seminar<br>- Roads<br>- Workers' Training<br>2.Village Development<br>- Infrastructure<br>- Human Resource<br>3.Agriculture | Execution:<br>Forest Dept.NWFP |
| Watershed Management and Forest Extension Project in Dir-Swat District(Phase II) | Dir and Swat Districts excluding Kalam and Utror | 3 Years June 1987- June 1990 | NWFP Food Assist: 76.75<br>NWFP: 26.78<br>Netherlands Assist 71.62<br>Total 175.16 | 1.Forestry<br>- Soil Conservation in Non-arable Land<br>- Fruit Trees<br>2.Soil and Water Conservation<br>3.Pasture and Grassland Improvement | Sponsor:<br>Food,Agriculture and Cooperative Dept. NWFP<br>Execution:<br>Forest Dept. NWFP |
| Malakand Fruit and Vegetable Development Project | Swat, Dir and Chitral Dist. Malakand Div. | 3 Years, Jul.1987- Jun.1990, Extendable for Another Sixty Months | LC: 5.62<br>FC: 17.05<br>(Switzerland Aid)<br>Total 22.67 | 1.Trust A: Master Plan/ Coordination<br>2.Trust B: Extension/ Training<br>3.Trust C: Technology/ Transfer Adaptive Research | Sponsor:<br>Agri. and Coop.Dept.<br>Execution:<br>-Fruit and Vegetable Development Board<br>-Research Station North Mingora |
| Social Forestry Project in Malakand Agency | Malakand Div. | 60 months 1985/86 - 1989/90 | LC: 1.9<br>FC:40.8<br>(W.Germany Aid)<br>Total 41.9 | 1.Staff Training<br>2.Village Forest and Fruit Nursery<br>3.Afforestation<br>4.Soil Conservation<br>5.Grass Land Management<br>6.Consultancy and Training | Execution:<br>-Forest Department |
| Income Generating Project in Buner, Phase II | Koga in Buner Sub-Division | 3 Years 1988-1990 | World Bank Aid | Rehabilitation of Damaged Forest by Afgani Refuge and Cattle | Sponsor:<br>- United Nation High Commissio Afgani Refuge |
| Small Hydro Power Development Project for Remote Mountainous Area in Malakand Div. | Left Bank of Gorbank River Shangla Par Sub-Div. | 3 Years 1986-1988 | LC: 36.83<br>FC: 19.59<br>(W. Germany)<br>Total 56.42 | 4,200 kw x4 units Turbo-Generator | Sponsor:<br>- Irrigation Dept.<br>Execution:<br>- Irrigation and Public Health Engineering Depts. |
| On-farm Water Management Project | | 3 Years(Phase I) 1982- 1985<br>7 years(Phase II) 1985-1993 | US Aid<br>World bank | | Execution:<br>- Water Management Department |
| Provincially Administered Trival Areas (PATA) Groundwater Irrigation Project | Malakand Division | 4 Years 1986- 1990 | LC: 24.65<br>FC: 185.02<br>Total 209.67 | 1. Ground water Development Increase<br>2. Agricultural Production Increase<br>3. Staff Training<br>4. Attainment of Local People Participation | Sponsor:<br>- Planning and Development |

TABLE 4-2 DEVELOPMENT PLANS BY LOCAL PROGRAMME
(ON - GOING AND NEW SCHEMES)

| Sector | Nos.of Project | Kinds and Number of Project | Project Period |
|---|---|---|---|
| Agriculture | 7 | Agriculture Machinery 1 Soil Conservation 1, Cooperative Society 1, Fruit 1,Agriculture Extension 1, Livestock 2 (On-going 5, New Scheme 2) | 1986/1987 to 1990/1991 |
| Irrigation and Hydel-Power | 8 | Irrigation 8 (On-going 6,New Scheme 2) | 1986/1987 to 1989/1990 |
| Rural Development | 2 | Minor Work Programmes 1 Rural Roads 1 (New Scheme 2) | 1988 to 1989 |
| Transportation and Communication | 27 | Rural Roads (On-going 12, New Scheme 15) | 1986/1991 |
| Public Health | 45 | Water Supply Scheme (On-going 9, New Scheme 33) Sanitation (On-going 3) | 1986/1989 |
| Education and Training | 291 | On-going: Primary 114. Secondary 18, College 3, Technical 1 New: Primary 70, Secondary 17, Equipment for Men Mosque School 68 | 1986/1987 to 1990/1991 |
| Rural Health Services | 54 | On-going: Establishment of BHC and BHU 10, Building 32 BHUs New: BHUs 6,Urban Dispensaries 2, Upgrading to BHC 2, Improvement of Civil Hospital 1, Oxyge Concentrator Plant 1 | 1986/1987 to 1990/1991 |

i) Increase in family income and expansion of employment opportunity,and

ii) Acceleration of rural development for improvement of the social infrastructure.

2) Main Study Subjects for Attainments of Strategies

In order to attain the above-metioned strategies for the rural development, following subjects should be studied;

- The development of natural resources available in the Project Area and the way of better utilization of them and increase in agricultural production,
- The measures to alleviate the income disparity between the rural and urban people in the area,
- The measures for creation of employment opportunities for the local people,
- The measures to keep harmony of living environment with local natural condition and creation of the amenity of rural society, and
- The way to create the employment opportunities for low income people, women and youths, so that they can lead a useful life and all the people can positively participate in the works for vitalization of their own communities.

3) Development Time Target

In considering the depressed situations of the rural area in Swat District at present, the following three fundamental and overall targets are provided;

| | | |
|---|---|---|
| First | : Short-term development | (1990 - 1995) |
| Second | : Middle-term development | (1995 - 2000) |
| Third | : Long-term development | (2000 - 2005) |

### 4.2.2 Population Forecast

1) Population

The National Population Census of 1961, 1972 and 1981 shows an average annual growth rate of 3.7 percent in 1961-1972, 3.1 percent 1972-1981, while that of the NWFP 3.3 percent for 1961-1981.

The population in Swat District was approximately 888,000 in 1972, 1,233,000 in 1981 and the average growth rate is higher than that of the national value and NWFP. For the estimated population of 1988, it is difficult to determine the population growth rate in Swat District due to its standard national census conducted by the Population Census Organization of Pakistan in Swat in 1981.

The population forecast in 2005 was made in applying the following five cases of population growth rate;

| | |
|---|---|
| Case-1: | Average growth rate of 3.7 percent in Swat District during the period of 10 years, 1972-1981, |
| Case-2: | Average growth rate of 3.5 percent in Swat District during the period of 12 years, 1961-1972, |
| Case-3: | Estimated average growth rate of 2.9 percent in Swat District during the period of 8 years, 1981-1988, |
| Case-4: | "Alteration Rate for the Factor of Cohort" of 2.8 percent in NWFP during the period of 10 years,1972-1981,and |
| Case-5 | Adopted growth rate of 3.2 percent in the study. |

The population in Swat District was estimated to be 1,537,000 in 1988 with 3.2 percent of the natural growth rate. The population growth rate shows 3.5 percent in 1960's (1961-1972), and 3.7 percent in 1970's (1972-1981) in Swat District. On the other hand, the population in 1990 of Swat District is forecasted at 1,580,000 with a natural growth rate of 2.8 percent, based on "Alteration Rate for the Factor of Cohort" for the ten years (1972-1981) in NWFP, which was coveted to the Swat population in 1981-1990. However, according to the report on Buner Development Project, the growth rate of NWFP was 2.7 percent.

Estimated Population by Population Growth Rate in Swat District

| Year | 3.7% | 3.5% | 3.2% | 2.9% | 2.8% |
|---|---|---|---|---|---|
| 1981 | 1,233.0 | 1,233.0 | 1,233.0 | 1,233.0 | 1,233.0 |
| 1988 | 1,590.1 | 1,568.7 | 1,537.3 | 1,506.2 | 1,495.8 |
| 1990 | 1,709.9 | 1,680.4 | 1,637.3 | 1,595.1 | 1,580.7 |
| 1995 | 2,050.6 | 1,995.8 | 1,916.6 | 1,840.2 | 1,814.8 |
| 2000 | 2,459.1 | 2,370.3 | 2,243.5 | 2,122.9 | 2,083.4 |
| 2005 | 2,949.0 | 2,815.3 | 2,626.2 | 2,449.0 | 2,391.7 |

The population growth rate to be applied in this study is decided at 3.2 percent on the basis of the field survey in October-December, 1988 and statistical analysis on the average growth rate of 3.6 percent in 1961-1981 in Swat and 2.8 percent by Cohort method in 1972-1981, NWFP converted to Swat.

The population forecast in 1995, 2000 and 2005 in each Sub-Division in Swat District is as follows:

Estimated Population Forecast in Swat
(Growth Rate: 3.2%)

(unit: thousand)

| Year | Swat District | Swat Sub-Division | Shangla Par Sub-Division | Buner Sub-Division |
|---|---|---|---|---|
| 1981 | 1,233.0 | 716.0 | 251.5 | 265.5 |
| 1988 | 1,537.3 | 892.6 | 313.4 | 330.9 |
| 1995 | 1,916.6 | 1,112.8 | 390.6 | 412.5 |
| 2000 | 2,243.5 | 1,312.9 | 457.2 | 482.9 |
| 2005 | 2,626.2 | 1,536.8 | 535.2 | 565.3 |

2) Households

The household forecast in 2005 was made adopting 2.4 percent of the annual growth rate, based on the data of population and household size of NWFP in 1961, 1972 and 1981. The number of household of each Sub-Division was computed based on the Household Census in 1980, Population Census in 1981, and Village Profile Survey in 1988.

3) Labour Force

According to the Seventh Five - Year Development Plan of Pakistan, the labour force in 1993 is shown as follows:

Seventh Five - Year Labour Force

| Year | Population (A) | Labour Force (B) | (B)/(A) (%) | Employment | Unemployment (C) | (B)/(C) (%) |
|---|---|---|---|---|---|---|
| 1988 | 105.43 | 31.00 | 29.4 | 29.89 | 1.11 | 3.6 |
| 1993 | 122.82 | 36.54 | 29.8 | 33.76 | 2.78 | 7.6 |

The labour farce in 2005 was computed based on above-mentioned average labour force growth rate of 3.2 percent and the assumption of the unemployment ratio of 4.4 percent, thus, labour force percentage is 27.5 percent (labour opportunity 339,000/total population 1,233,000). The estimated household and labour force in 1988-2005 are as follows:

Estimated Household and Labour Force

(Unit: thousand)

| Estimated Household | 1988 | 1993 | 1998 | 2005 |
|---|---|---|---|---|
| Swat District | 229 | 258 | 291 | 327 |
| Swat Sub-Division | 131 | 148 | 167 | 197 |
| -Rural | 118 | 132 | 149 | 176 |
| -Urban | 13 | 16 | 18 | 21 |
| Shangla Par Sub-Division | 48 | 53 | 59 | 70 |
| Buner Sub-Division | 50 | 57 | 65 | 76 |

| Estimated Labor Force | 1988 | 1993 | 1998 | 2005 |
|---|---|---|---|---|
| Population | 1,537 | 1,800 | 2,106 | 2,626 |
| Labour Force | 423 | 495 | 597 | 722 |
| -Employment | 404 | 473 | 554 | 690 |
| -Unemployment | 19 | 22 | 25 | 32 |

### 4.2.3. Growth Target of Economic Factors

#### 1) Target of Foods Self-Sufficiency and Increase in Population

Food production should be increased as much as possible in Swat District so as to meet the increasing demand with population growth. As a consequence, it is quite essential that the Master Plan Study should work out an adequate plan for effective use of land and water resources available in the area together with production increase in amount of crops and livestock, etc.

If the cropping acreages and yields of the main crops in the Sub-Division are not increase in future, the self-sufficiency rate of food will be reduced to the level shown in Table 4-3.

When the future annual increasing rate of the gross crop production value is projected higher rate than the population growth rate of 3.2 percent, the gross production value of crop in 2003 will be estimated as follows;

Projection on Annual Gross Production Value of Nine Crops

(unit: million Rupee)

| District/ Sub-Division | 1987 GPV | 2003 Present Growth Rate | 3.2% | 4.0% | 5.0% | 6.0% |
|---|---|---|---|---|---|---|
| Swat | 1,376 | 2,020 (2.4%) | 2,278 | 2,577 | 3,004 | 3,495 |
| Shangla Par | 135 | 200 (2.5) | 223 | 253 | 295 | 343 |
| Buner | 210 | 337 (3.0) | 347 | 393 | 458 | 533 |
| Swat District | 1,721 | 2,557 (2.5) | 2,845 | 3,223 | 3,757 | 4,371 |

#### 2) Gross Regional Production Value Per Capita (GRPV)

##### a) Economic Growth Target

The targets of the national economic growth projected in the Second Perspective Plan (1988-2003) are as follows;

- Population : 3.1 to 2.6 percent per year
- GNP : 6.2 percent per year
- GNP per capita (1987-1988 price):
  - 1988: Rs 5,800
  - 2003: Rs 9,170(annual growth rate is 3.0 percent)

b) Gross Production Value per Capita in Swat District

The gross production value of nine crops per capita is estimated at Rs 1,233 in 1987. The gross regional production value per capita in Swat District is estimated based on this crop production value as follows;

Gross Regional Production Value Per Capita (GRPV) in 1987:

- Gross production value per capita (GRPV) in the agricultural sector : Rs 1,761 (Rs 1,233/0.7 1/)
- GRPV per capita : Rs 5,870 (Rs 1,761/0.3 2/)

Note: 1/ 0.7 is the rate of the crop production value to total value of the agricultural sector.

2/ The percentage of the agricultural sector to GPV of NWFP were estimated at 28 percent in 1982/1983 and 25 in 1985/1986. The rate of the agricultural sector in Swat District is assumed at 30 percent taking into account the difference in an employment structure between NWFP and Swat District.

GRPV Per Capita in 2003:

| 1987 | 2003 | | | | |
|---|---|---|---|---|---|
| | Present | Annual Growth Rate of GPV | | | |
| | Rate | 3.2% | 4.0% | 5.0% | 6.0% |
| 5,870 | 5,280 | 5,880 | 6,657 | 7,757 | 9,023 |

The present GRPV per capita in Swat District is almost equal to that in Pakistan. GRPV per capita in Swat District in 2003 shall reach to the national target under the annual growth rate of six percent.

3) Increase in Population and Generation of Employment Opportunity

The labour force available in 1988 is estimated at 404,000 persons. This is projected to increase by 690,000 persons in 2005. Hence the labour force increases in 286,000 persons in future. If the employment structure based on the 1981 population census is still kept to 2005, an incremental labour force mentioned above has to look for the more employment opportunities.

Requirement of Employment Opportunity for an Incremental Labour Force

| Item | Agri-culture | Mining | In-dustry | Com-merce | Service | Others | Total |
|---|---|---|---|---|---|---|---|
| Employment Ratio (%) | 77.7 | 0.3 | 2.0 | 4.7 | 8.5 | 6.8 | 100.0 |
| Labour Force (1,000persons) | | | | | | | |
| 1988 | 313.9 | 1.2 | 8.1 | 19.0 | 34.3 | 27.5 | 404.0 |
| 2005 | 536.1 | 2.1 | 13.8 | 32.4 | 58.7 | 46.9 | 690.0 |
| Incremental | 222.2 | 0.9 | 5.7 | 13.4 | 24.4 | 19.4 | 286.0 |

## TABLE 4-3 PRESENT AND FUTURE FOOD SELF-SUFFICIENCY

(unit: %)

| Crop | Swat Sub-Division | | Shangla Par Sub-Division | | Buner Sub-Division | | Swat District | |
|---|---|---|---|---|---|---|---|---|
| | 1987 | 2003 | 1987 | 2003 | 1987 | 2003 | 1987 | 2003 |
| Wheat | 55 | 41-44 | 44 | 32-39 | 91 | 76-94 | 57 | 42-51 |
| Rice | 100 | 100 | 45 | 26-28 | 9 | 5-6 | 100 | 69-71 |
| Maize | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Pulses | 93 | 81-100 | 1 | 1-5 | 91 | 71-100 | 69 | 59-75 |
| Barley | 71 | 66-84 | 18 | 21-24 | 94 | 100 | 61 | 64-84 |
| Fruits | 100 | 100 | 8 | 5-7 | 1 | 1-3 | 100 | 68-70 |
| Vegetable | 82 | 42-48 | 9 | 5 | 21 | 10-12 | 50 | 25-29 |
| Potatoes | 100 | 100 | 49 | 26-55 | 11 | 6-10 | 100 | 100 |
| Sugarcane | 100 | 100 | 41 | 21-23 | 100 | 100 | 100 | 100 |

Note: Annual growth rates of crop acreage and yield used in this study are two kinds such as average growth rate for 1982/1983 to 1986/1987 in Swat District and for 1983/1984 to 1986/1987 by Sub-Division. The former has the statistical accuracy because of more long term of data.

The surplus foods are supplied by crops with self-sufficiency of 100 percent. Hence such crops have the high marketability.