ANNEX G. PROJECT FACILITIES AND COST ESTIMATION

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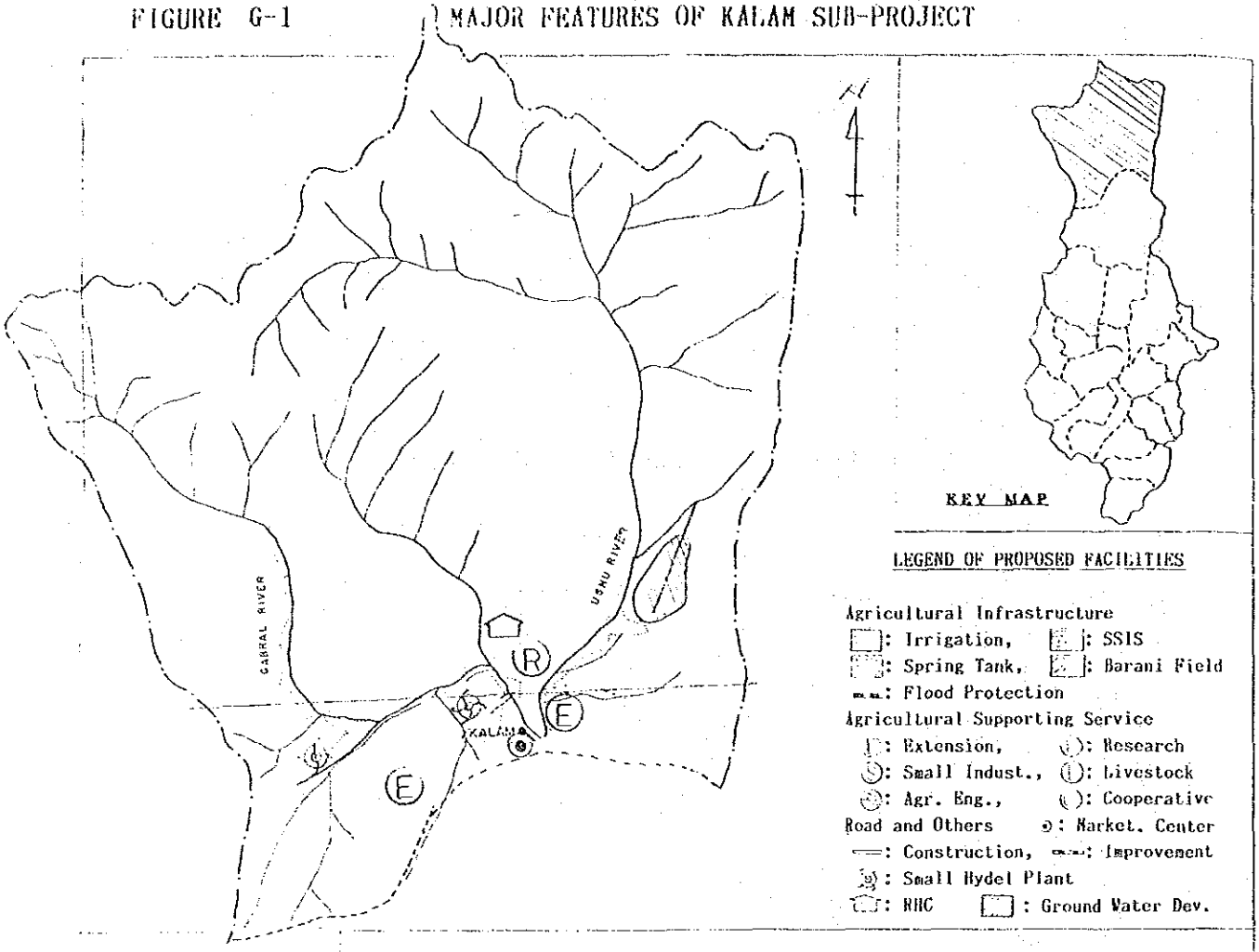
CHAPTER I. PROJECT FACILITIES

1.1. Sub-Project Wise Proposed Facilities

FIGURE G-1 MAJOR FEATURES OF KALAM SUB-PROJECT



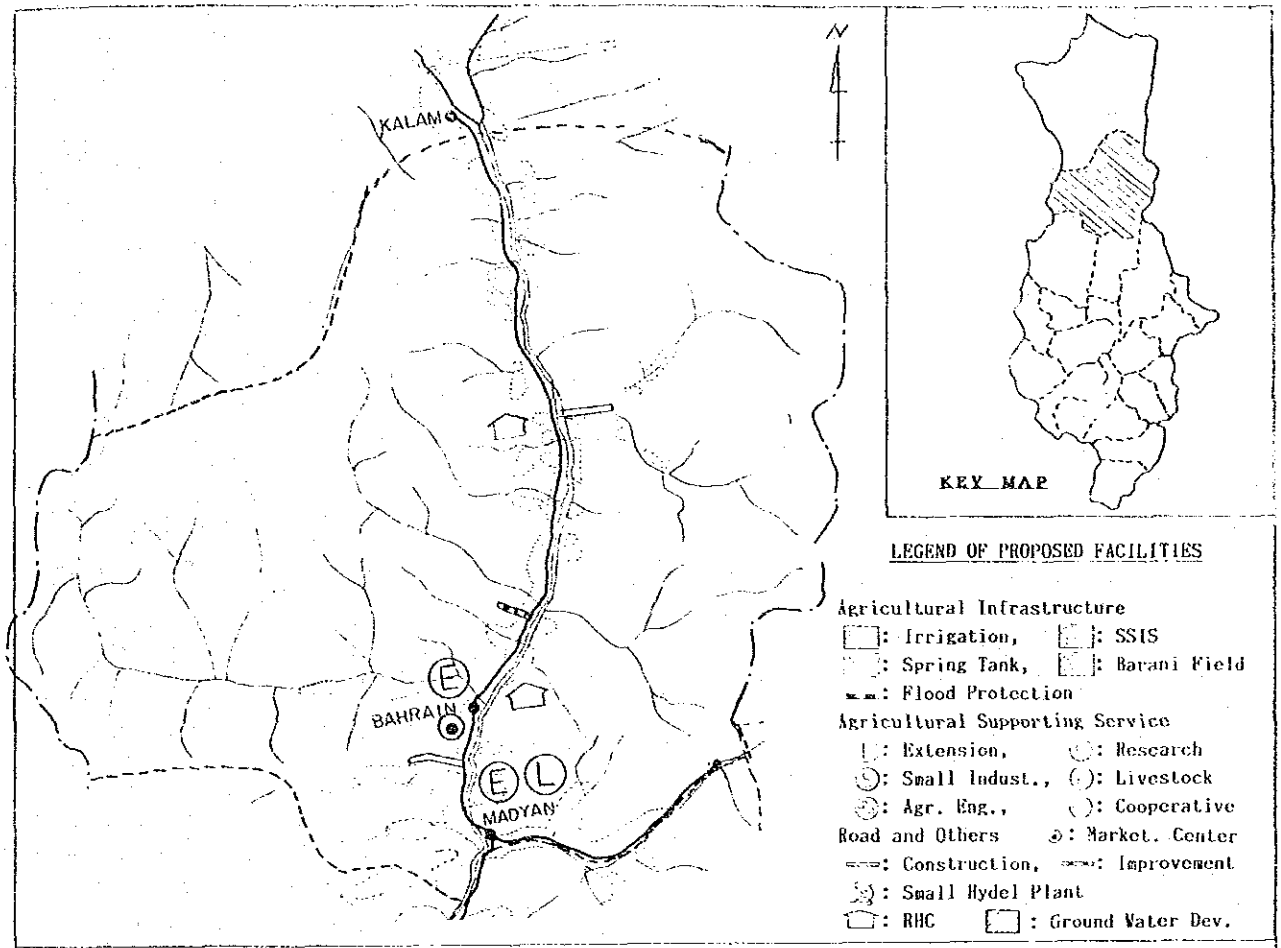
Description of Area	1. Location	: Kalam Tehsil, Swat Sub-Div.	
	2. Area		
	- Total Area	: 222,110 ha	
	- Cultivated Area	: 2,150 ha	
	3. Population (1988)	: 31,500	(14 person/sq.km)
	4. No. of Village	: 45	

Description of Project

1. Proposed Development Works:
- Agr.Infrastructure: Ushoran Irrig.Scheme,SSIS(2 No.),etc
- Agr.Supporting: Agricultural Training Center, Research Sub-station, Marketing Sub-center, etc.
- Road: Improvement/Construction(13 km)
- Electrification: Small Hydel Station(400 and 200 kw), WAPDA Extension(5,700 houses)
- Water Supply: New Schemes(5,700 houses)
- Rural Infra.: Schools Impr./Const.(82 schools),BHU,RHC Impr./Const.(6 No),Ambulance, Latrines(1,700 houses)

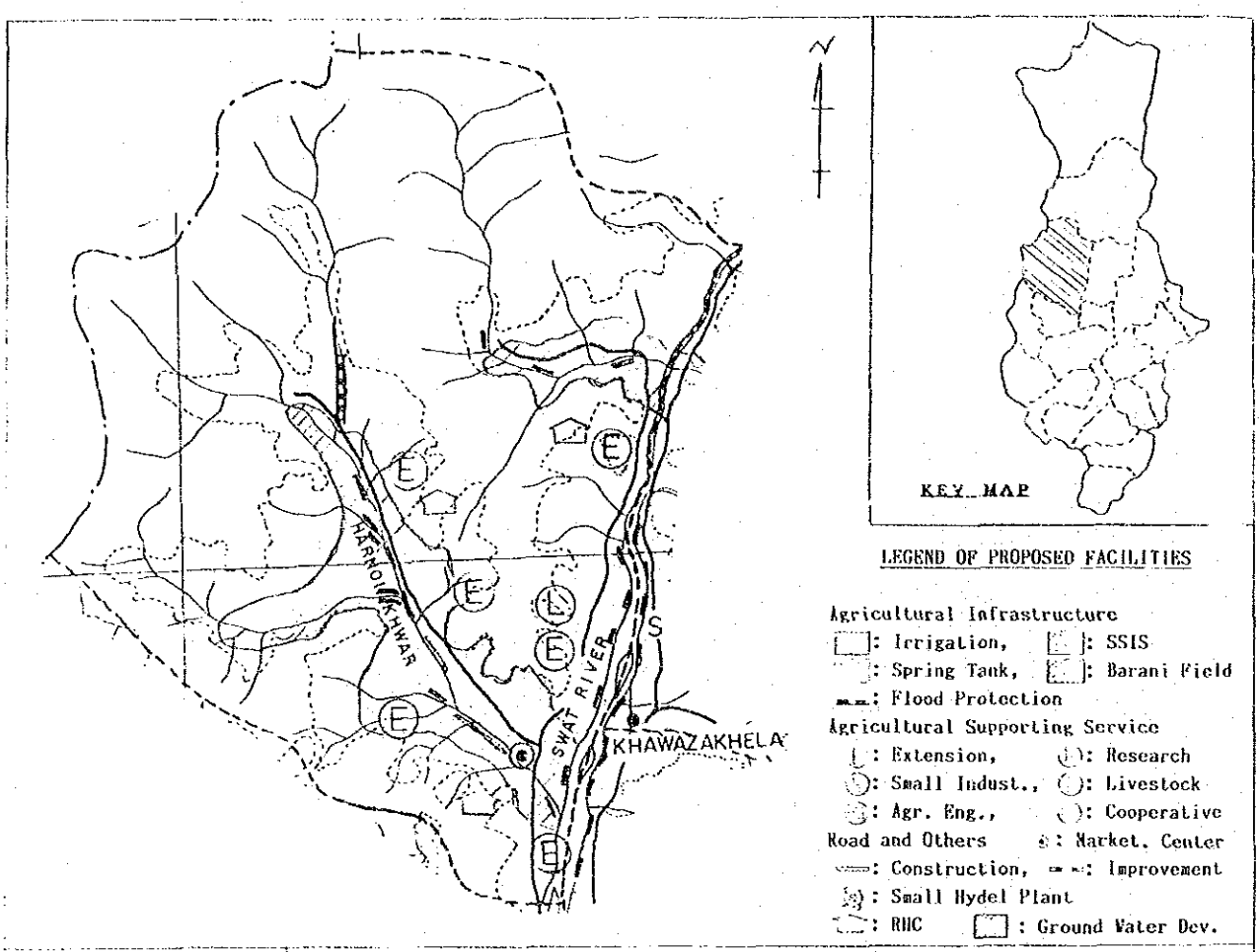
2. Total Development Cost: Rs. 261.4 million

FIGURE G-2 MAJOR FEATURES OF BAHRAIN SUB-PROJECT



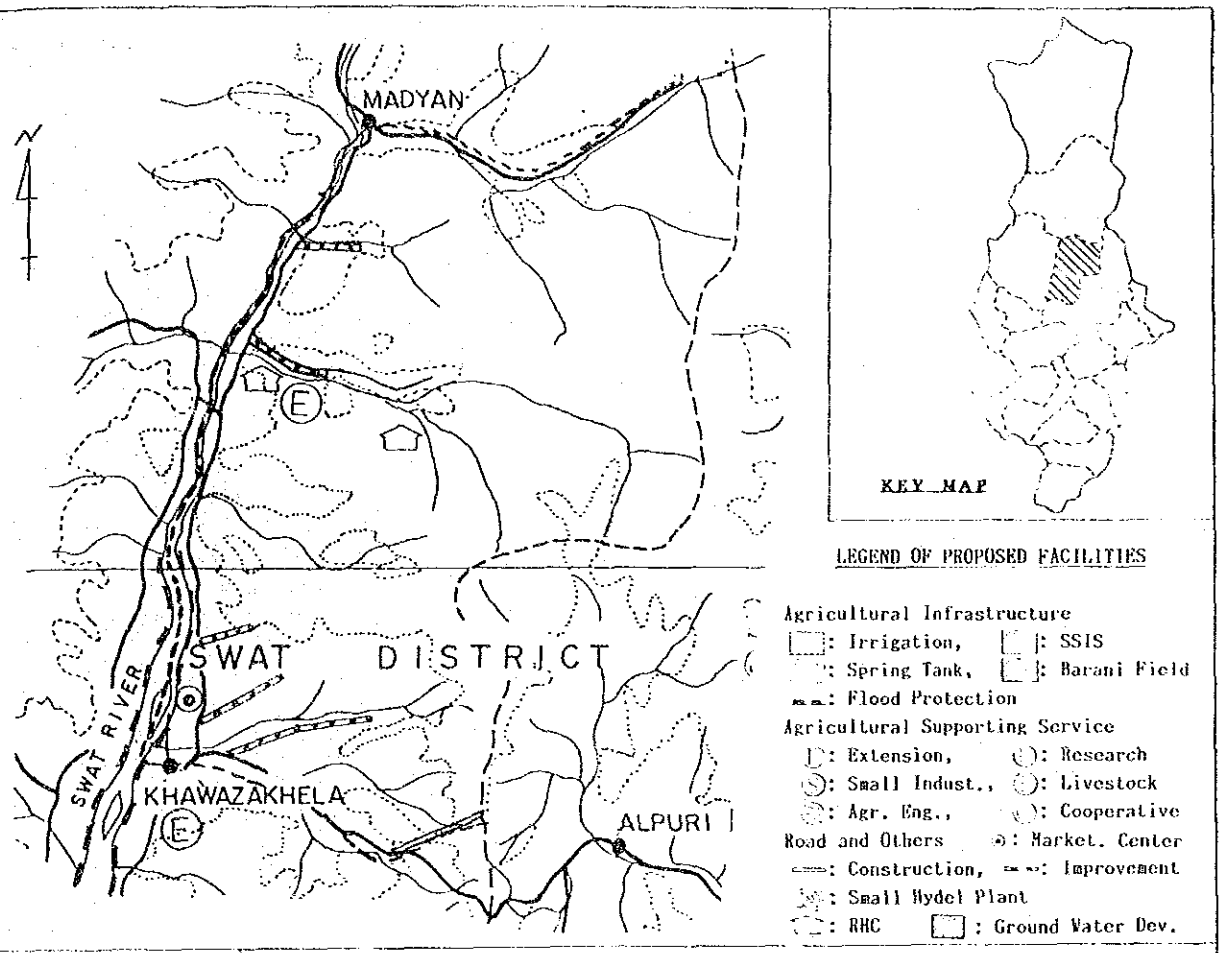
Description of Area	1. Location : Bahrain Teh: Swat Sub-Division 2. Area - Total Area : 92,240 - Cultivated Area : 6,500 3. Population (1988) : 85,221 (92 person/sq.km) 4. No. of Village : 113
Description of Project	1. Proposed Development Works: - Agr.Infrastructure: SSIS(2 No.), Spring Tank(5 No.) - Agr.Supporting: Agricultural Training Center, Natural Breeding Center, Marketing Sub-center, etc. - Road: Improvement/Construction(60.5 km) - Electrification: WAPDA Extension(12,300 houses) - Water Supply: New Schemes(13,300 houses) - Rural Infra.: Schools Impr./Const.(219 schools), BHU,RHC Impr./Const.(17 No), Ambulance, Latrines(4,500 houses) 2. Total Development Cost: Rs. 532.8 million

FIGURE G-3 MAJOR FEATURES OF MATTA SUB-PROJECT



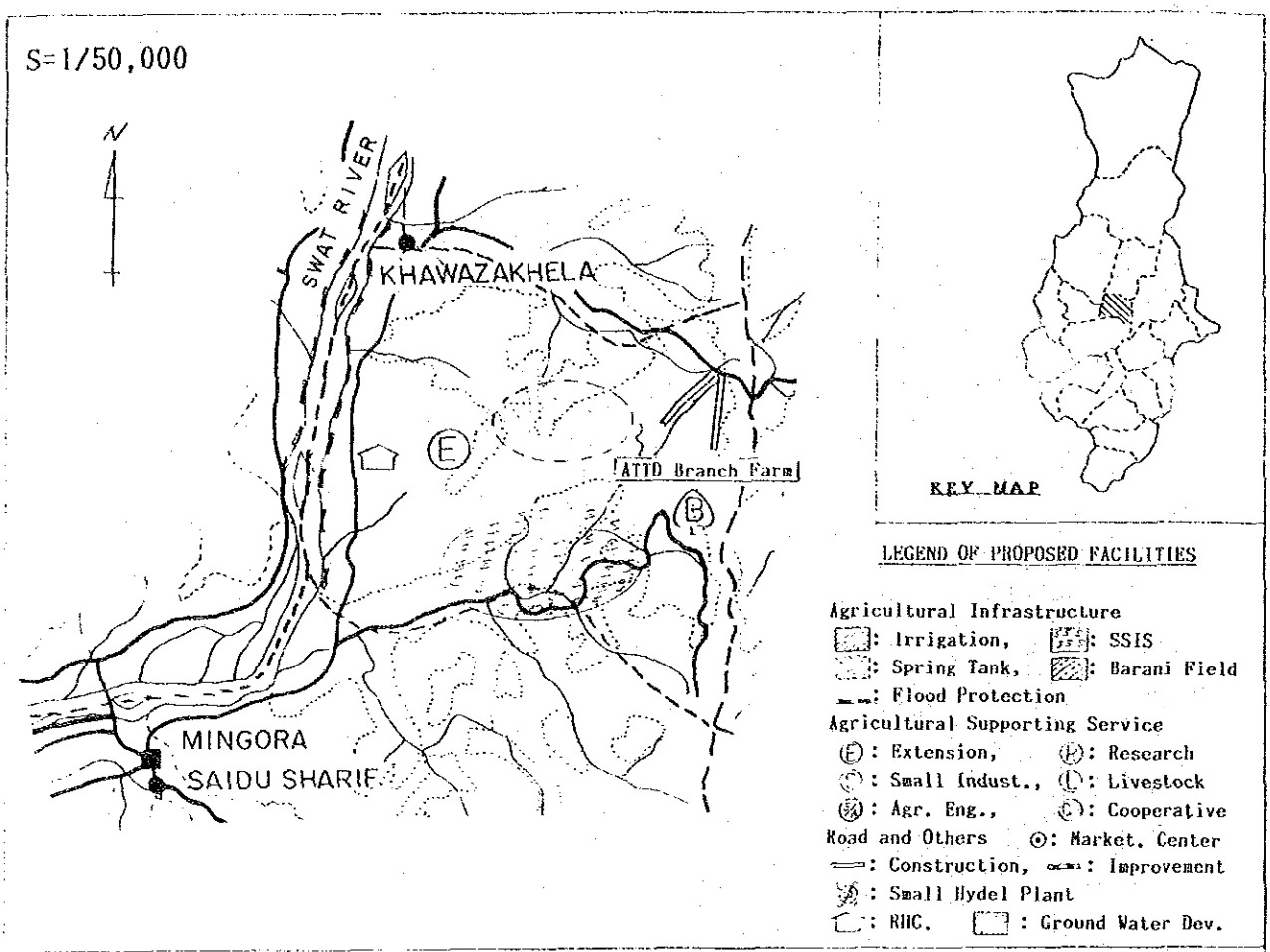
Description of Area	1. Location : Matta Tehsil, Swat Sub-Div. 2. Area - Total Area : 70,170 - Cultivated Area : 25,560 3. Population (1988) : 211,080 (301 person/sq.km) 4. No. of Village : 171
Description of Project	1. Proposed Development Works: - Agr.Infrastructure: Barwai,Harnoi Schemes, SSIS(10 No.), Spring Tank(7 No.), Flood Control(5.8 km), etc. - Agr.Supporting: Agricultural Training Center(2 No.), Seed Farm, Bee Keeping Center, Marketing Center, etc - Road: Improvement/Construction(61.0 km) - Electrification: WAPDA Extension(25,800 houses) - Water Supply: New Schemes(31,000 houses) - Rural Infra.: Schools Impr./Const.(542 schools), BHU,RHC Impr./Const.(39 No), Latrines(10,600 houses) 2. Total Development Cost: Rs. 905.7 million

FIGURE G-4 MAJOR FEATURES OF KHAWAZAKHELA SUB-PROJECT



Description of Area	1. Location : Khwazakhela Tehsil,Swat Sub-Div. 2. Area - Total Area : 45,710 (Including Charbagh) - Cultivated Area : 18,700 (-do-) 3. Population (1988) : 100,888 (339 person/sq.km) 4. No. of Village : 129
Description of Project	1. Proposed Development Works: - Agr.Infrastructure: SSIS(8 No.), Spring Tank(7 No.), Flood Control(5.0 km) - Agr.Supporting: Agricultural Training Center, Marketing Center, F & V Training Office, etc. - Road: Improvement/Construction(50.0 km) - Electrification: WAPDA Extension(14,200 houses) - Water Supply: New Schemes(10,400 houses) - Rural Infra.: Schools Impr./Const.(258 schools), BHU,RHC Impr./Const.(19 No),Ambulance,Latrines(5,200 houses) 2. Total Development Cost: Rs. 601.2 million

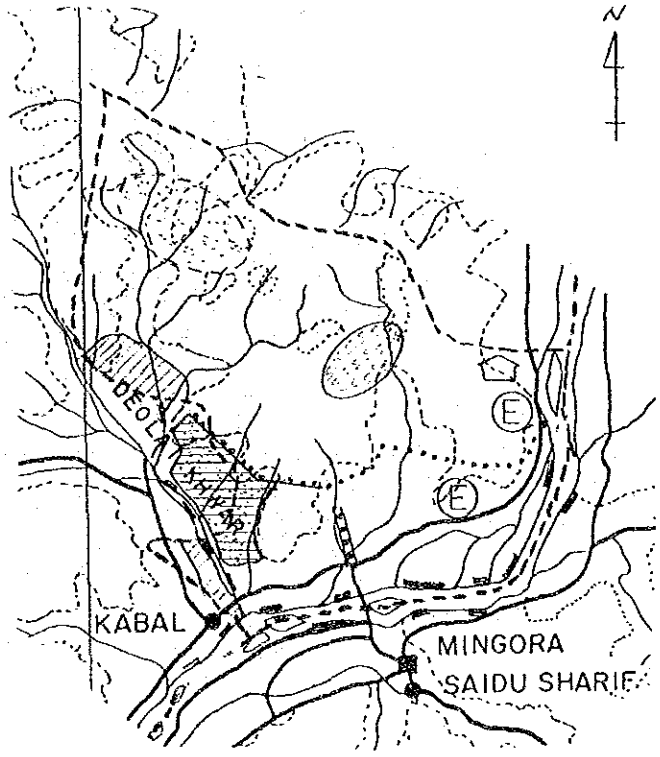
FIGURE G-5 MAJOR FEATURES OF CHARBAGH SUB-PROJECT

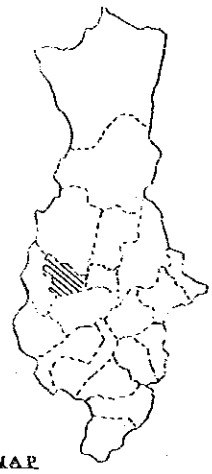


Description of Area	1. Location : Charbagh Tehsil,Swat Sub-Div. 2. Area - Total Area : - Cultivated Area : 3. Population (1988) : 54,000 (person/sq.km) 4. No. of Village : 123
Description of Project	1. Proposed Development Works: - Agr.Infrastructure: SSIS(6 No.), Spring Tank(5 No.), Flood Control(3.0 km) - Agr.Supporting: Agricultural Training Center, ATTD Farm Branch, Extension F.A. Office - Road: Improvement/Construction(22.0 km) - Electrification: WAPDA Extension(6,400 houses) - Water Supply: New Schemes(5,800 houses) - Rural Infra.: Schools Impr./Const.(139 schools), BHU,RHC Impr./Const.(11 No), Latrines(2,600 houses) 2. Total Development Cost: Rs. 314.0 million

FIGURE G-6 MAJOR FEATURES OF KANJU SUB-PROJECT

S=1/50,000



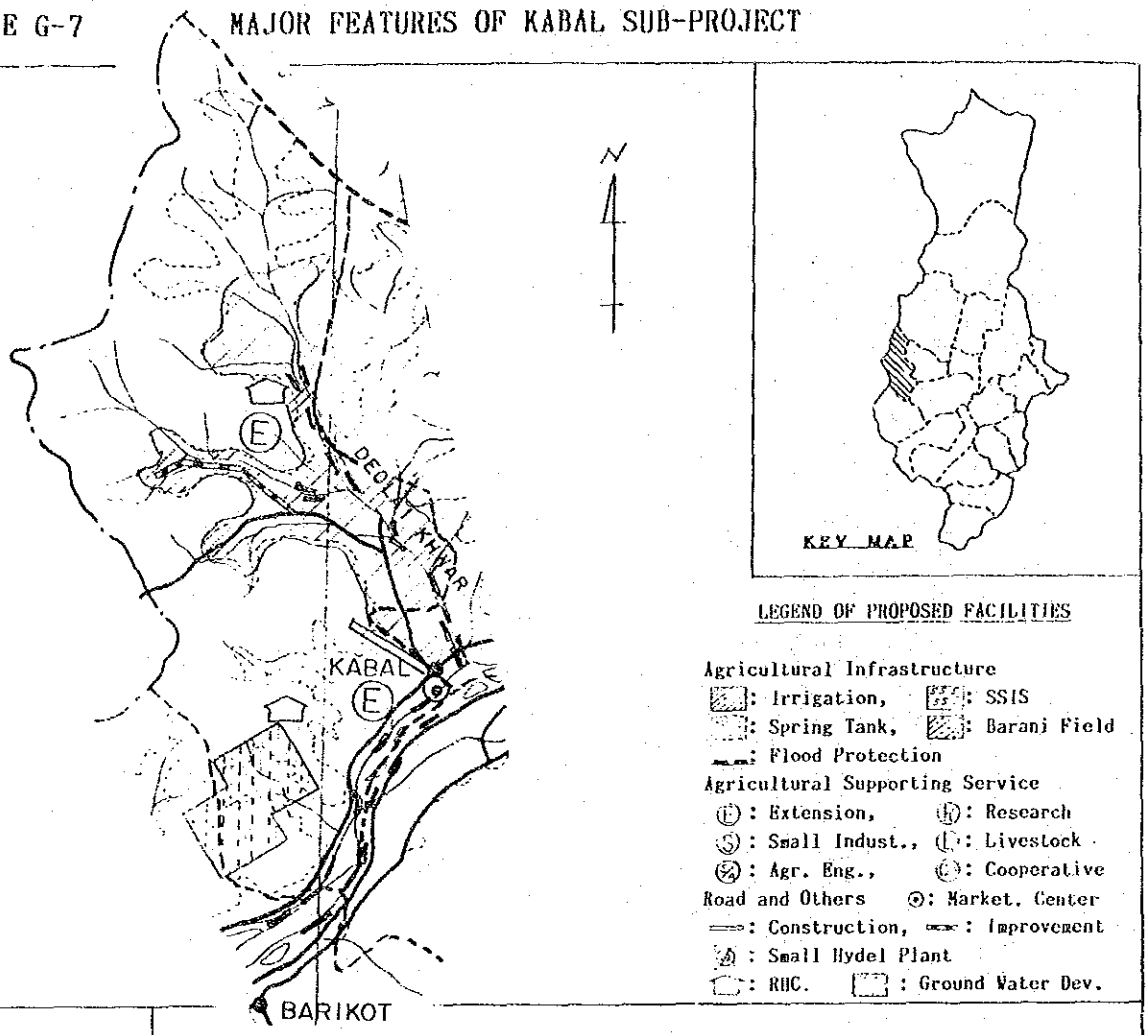


LEGEND OF PROPOSED FACILITIES

Agricultural Infrastructure
: Irrigation, : SSIS
: Spring Tank, : Barani Field
: Flood Protection
Agricultural Supporting Service
: Extension, : Research
: Small Indust., : Livestock
: Agr. Eng., : Cooperative
Road and Others : Market. Center
: Construction, : Improvement
: Small Hydel Plant
: RHC : Ground Water Dev.

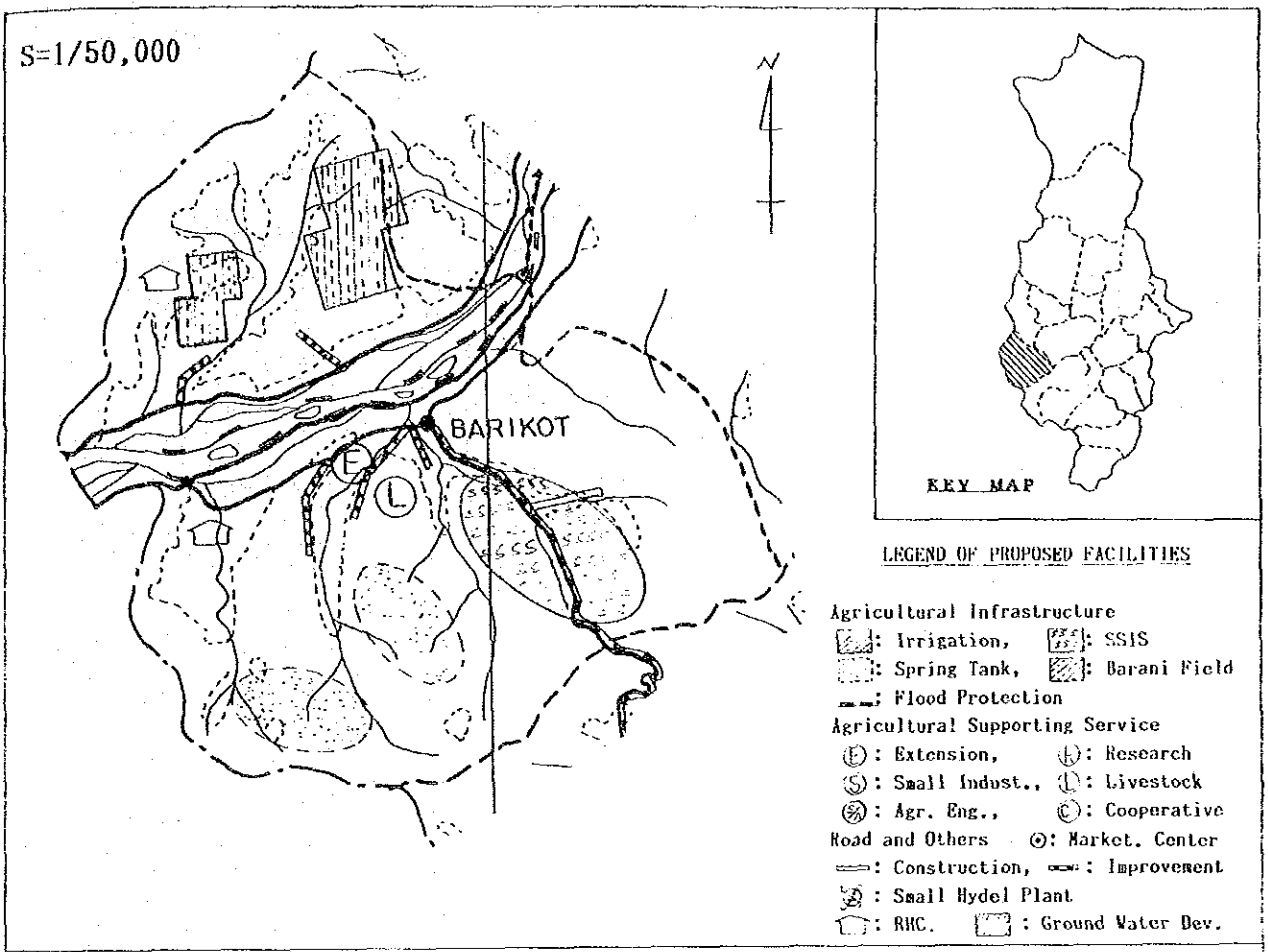
Description of Area	1. Location : Kanju Tehsil, Swat Sub-Div. 2. Area - Total Area : - Cultivated Area : 3. Population (1988) : 50,540 (person/sq.km) 4. No. of Village : 46
Description of Project	1. Proposed Development Works: - Agr.Infrastructure: Nipki Khel Canal and Deolai Schemes, SSIS(8 No.), Barani Field(1,400 ha), Fool Control - Agr.Supporting: Agricultural Training Center, F & V Training Office, Extension F.A Office - Road: Improvement/Construction(5.0 km) - Electrification: WAPDA Extension(5,600 houses) - Water Supply: New Schemes(6,200 houses) - Rural Infra.: Schools Impr./Const.(130 schools), BHU,RHC Impr./Const.(10 No),Ambulance,Latrines(2,400 houses) 2. Total Development Cost: Rs. 422.9 million

FIGURE G-7 MAJOR FEATURES OF KABAL SUB-PROJECT



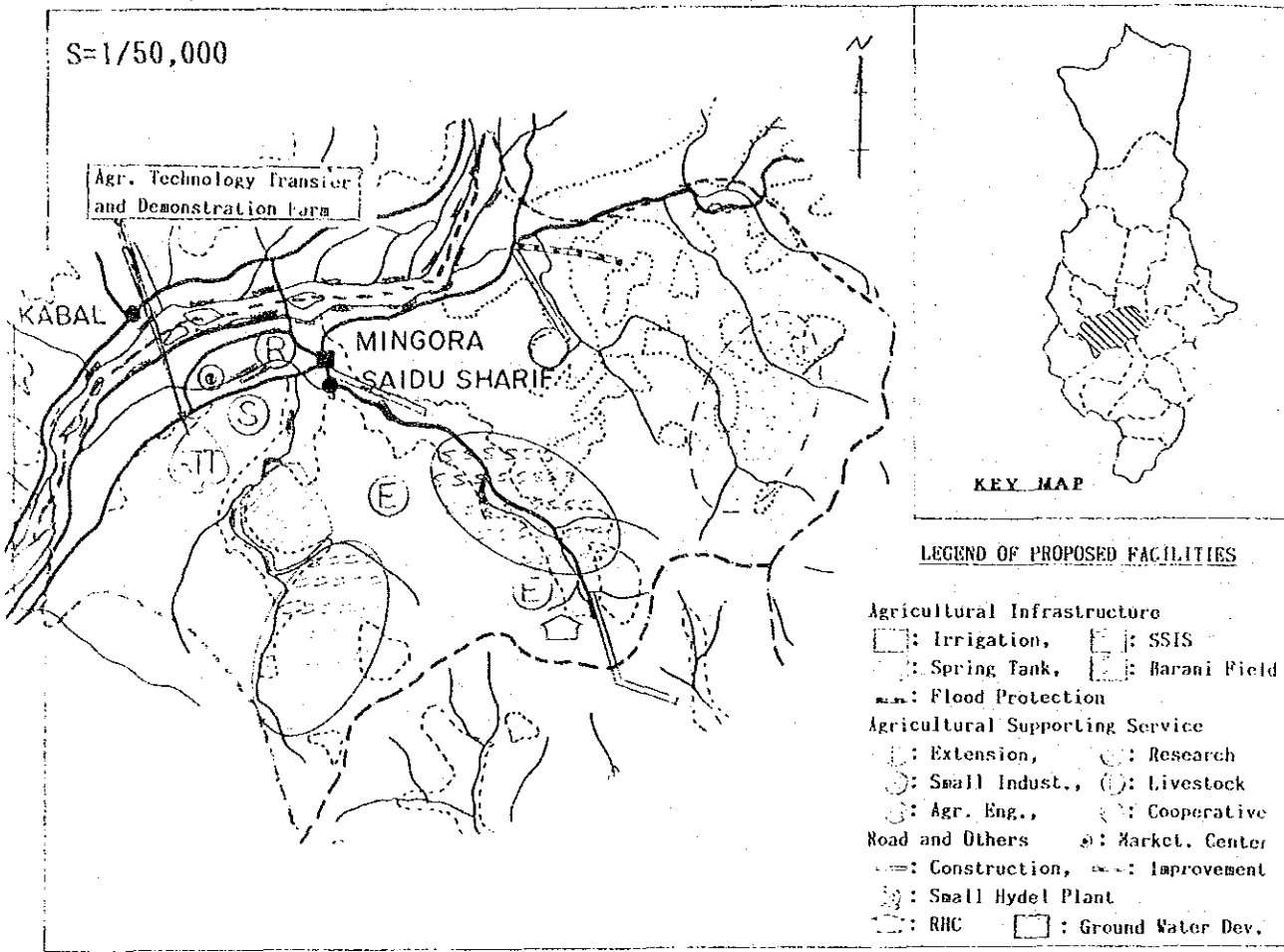
Description of Area	1. Location : Kabal Tehsil, Swat Sub-Div. 2. Area : - Total Area : 43,630 - Cultivated Area : 21,080 3. Population (1988) : 136,020 (312 person/sq.km) 4. No. of Village : 153
Description of Project	1. Proposed Development Works: - Agr.Infrastructure: Deolai Khwar Scheme, SSIS(8 No.), Barani Field(1,400 ha), Fool Control(3.0 km), etc. - Agr.Supporting: Agricultural Training Center, Marketing Sub-center, Extension F.A Office - Road: Improvement/Construction(18.2 km) - Electrification: WAPDA Extension(17,100 houses) - Water Supply: New Schemes(20,100 houses) - Rural Infra.: Schools Impr./Const.(349 schools), BHU,RHC Impr./Const.(26 No),Ambulance,Latrines(6,400 houses) 2. Total Development Cost: Rs. 780.7 million

FIGURE G-8 MAJOR FEATURES OF BARIKOT SUB-PROJECT



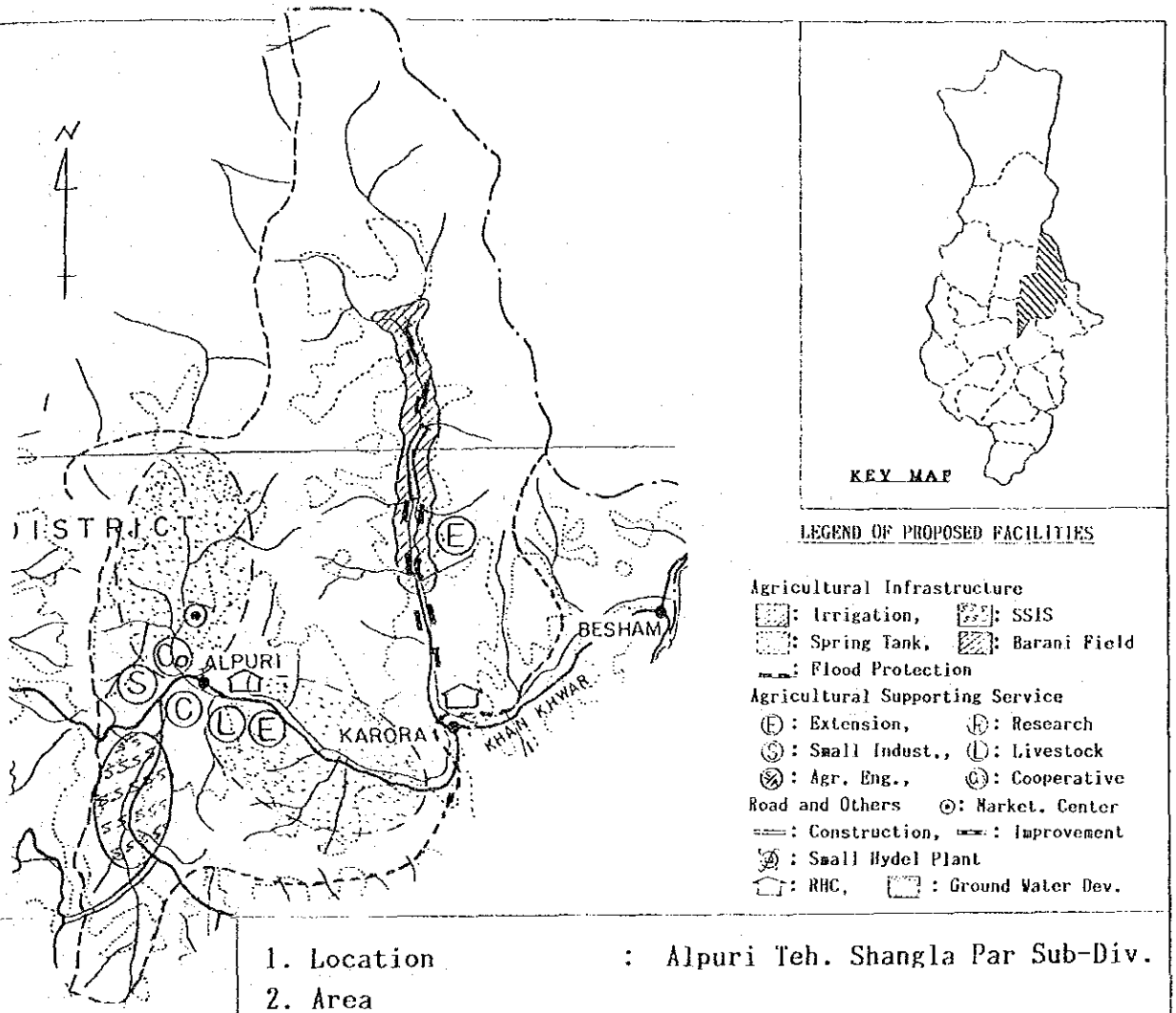
Description of Area	1. Location : Barikot Tehsil, Swat Sub-Div. 2. Area - Total Area : 37,420 - Cultivated Area : 12,320 3. Population (1988) : 64,637 (173 person/sq.km) 4. No. of Village : 98
Description of Project	1. Proposed Development Works: - Agr.Infrastructure: SSIS(6 No.), Spring Tank(6 No.) Barani Field(1,400 ha), Fool Control(3.0 km), etc. - Agr.Supporting: Agricultural Training Center, Natural Breeding Center, F & V Traning Office - Road: Improvement/Construction(60.5 km) - Electrification: WAPDA Extension(6,200 houses) - Water Supply: New Schemes(7,600 houses) - Rural Infra.: Schools Impr./Const.(166 schools), BHU,RHC Impr./Const.(12 No),Ambulance,Latrines(2,900 houses) 2. Total Development Cost: Rs. 471.2 million

FIGURE G-9 MAJOR FEATURES OF MINGORA SUB-PROJECT



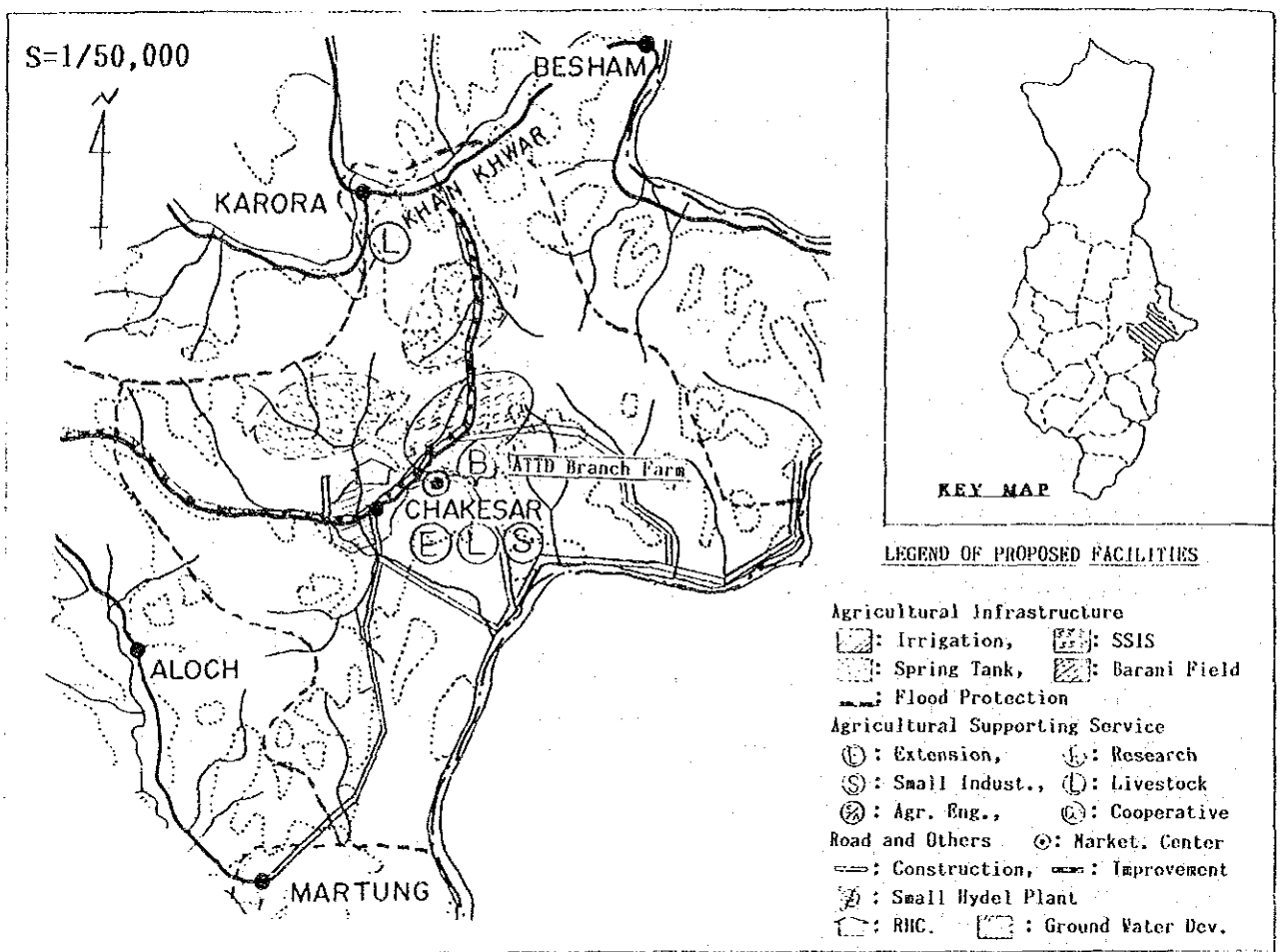
Description of Area	1. Location : Mingora Tehsil, Swat Sub-Div. 2. Area - Total Area : 33,790 (Including Kanju) - Cultivated Area : 11,670 (-do-) 3. Population (1988) : 96,379 (285 person/sq.km) 4. No. of Village : 165
Description of Project	1. Proposed Development Works: - Agr.Infrastructure: SSIS(6 No.), Spring Tank(6 No.), Improvement Scheme, Fool Control(5.0 km) - Agr.Supporting: Agricultural Training Center, ATTD Farm, Main Marketing Center, Factory, etc. - Road: Improvement/Construction(62.0 km) - Electrification: WAPDA Extension(10,800 houses) - Water Supply: New Schemes(11,800 houses) - Rural Infra.: Schools Impr./Const.(247 schools), BHU,RHC Impr./Const.(18 No), Latrines(4,600 houses) 2. Total Development Cost: Rs. 711.7 million

FIGURE G-10 MAJOR FEATURES OF ALPURI SUB-PROJECT



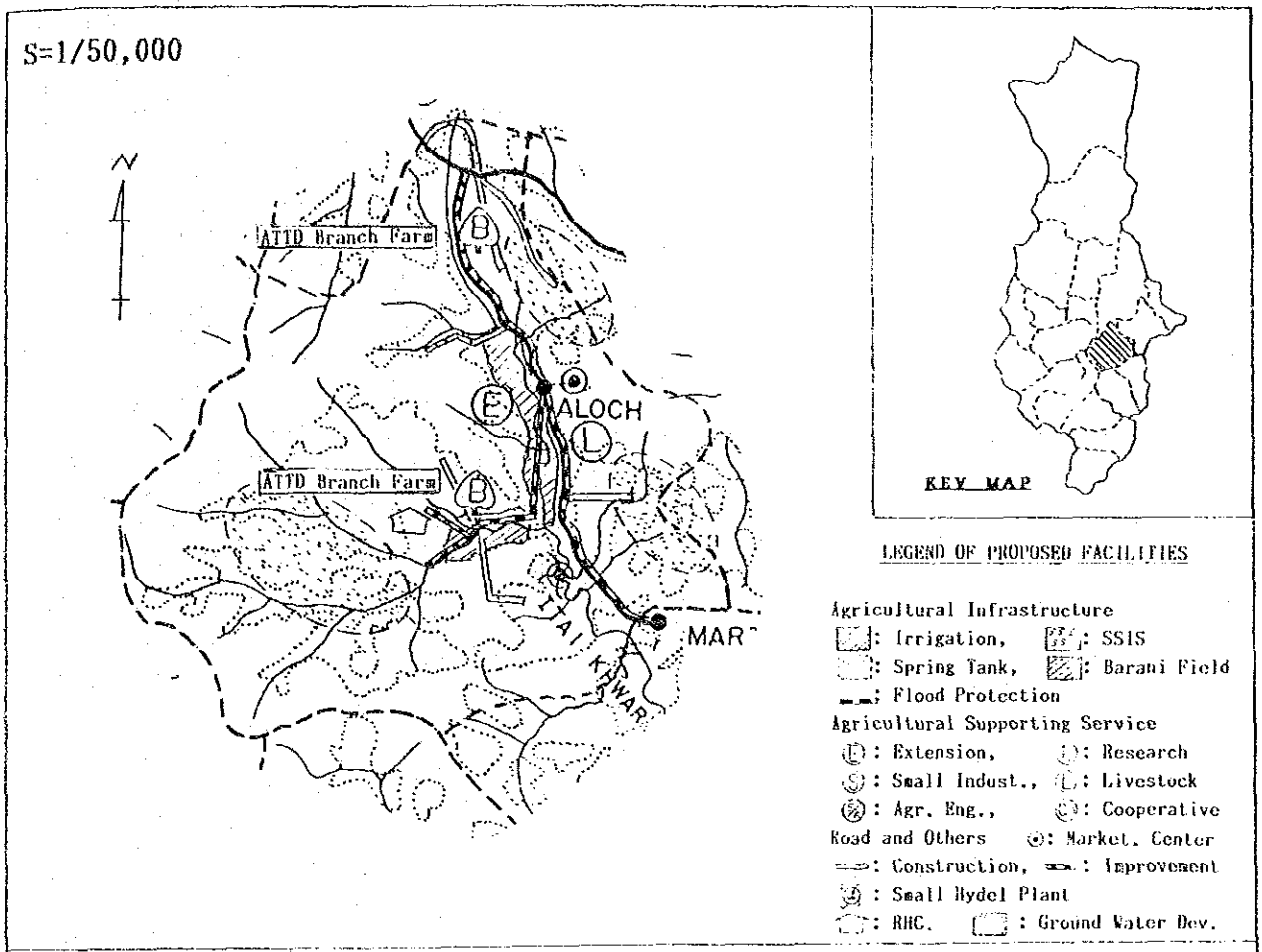
Description of Area	1. Location : Alpuri Teh. Shangla Par Sub-Div. 2. Area - Total Area : 61,770 - Cultivated Area : 16,510 3. Population (1988) : 121,495 (197 person/sq.km) 4. No. of Village : 211
Description of Project	1. Proposed Development Works: - Agr.Infrastructure: SSIS(6 No.), Spring Tank(10 No.), Kotkai SSIP, Kana Khwar Impr. Scheme - Agr.Supporting: Agricultural Training Center, Seed Farm, Marketing Sub-enter, Coop. Bank, etc. - Road: Improvement/Construction(53.5 km) - Electrification: WAPDA Extension(24,200 houses) - Water Supply: New Schemes(21,000 houses) - Rural Infra.: Schools Impr./Const.(311 schools), BHU,RHC Impr./Const.(24 No), Latrines(6,800 houses) 2. Total Development Cost: Rs. 838.7 million

FIGURE G-11 MAJOR FEATURES OF CHAKESAR SUB-PROJECT



Description of Area	1. Location : Chakesar Teh, Shangla Par Sub-Div. 2. Area - Total Area : 23,640 ha - Cultivated Area : 6,860 ha 3. Population (1988) : 51,466 (218 person/sq.km) 4. No. of Village : 101
Description of Project	1. Proposed Development Works: - Agr.Infrastructure: SSIS(6 No.), Spring Tank(10 No.), Chakesar Irrig. & Hydel Scheme - Agr.Supporting: ATTD Farm Branch, Agri. Training Center, Tractor Station, Marketing Sub-center, etc. - Road: Improvement/Construction(130.5 km) - Electrification: WAPDA Extension(10,700 houses) - Water Supply: New Schemes(9,300 houses) - Rural Infra.: Schools Impr./Const.(132 schools), BHU,RHC Impr./Const.(9 No),Ambulance, Latrines(2,800 houses) 2. Total Development Cost: Rs. 468.9 million

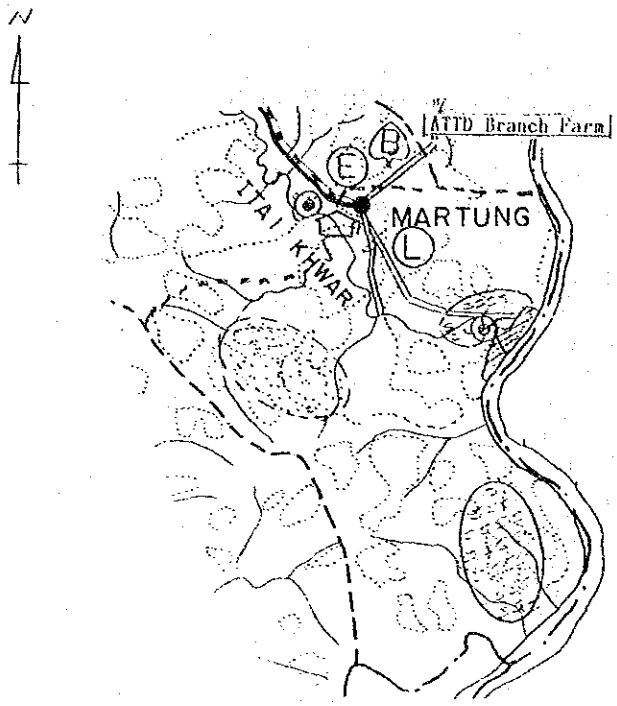
FIGURE G-12 MAJOR FEATURES OF PURAN SUB-PROJECT

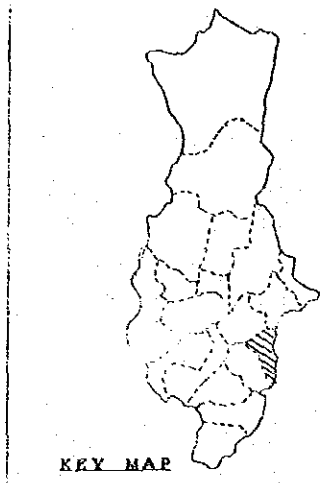


Description of Area	1. Location : Puran Teh. Shangla Par Sub-Div. 2. Area - Total Area : 26,910 ha - Cultivated Area : 8,400 ha 3. Population (1988) : 51,186 (190 person/sq.km) 4. No. of Village : 100
Description of Project	1. Proposed Development Works: - Agr.Infrastructure: SSIS(6 No.), Spring Tank(10 No.), Sandai Aloch and Choga Irrig. & Hydel Scheme - Agr.Supporting: Agri. Training Center, Fruit Nursery, Tractor Station, Marketing Sub-center, Seed Farm,etc - Road: Improvement/Construction(124.0 km) - Electrification: WAPDA Extension(10,100 houses) - Water Supply: New Schemes(8,400 houses) - Rural Infra.: Schools Impr./Const.(132 schools), BHU,RHC Impr./Const.(9 No),Ambulance, Latrines(2,700 houses) 2. Total Development Cost: Rs. 480.8 million

FIGURE G-13 MAJOR FEATURES OF MARTUNG SUB-PROJECT

S=1/50,000



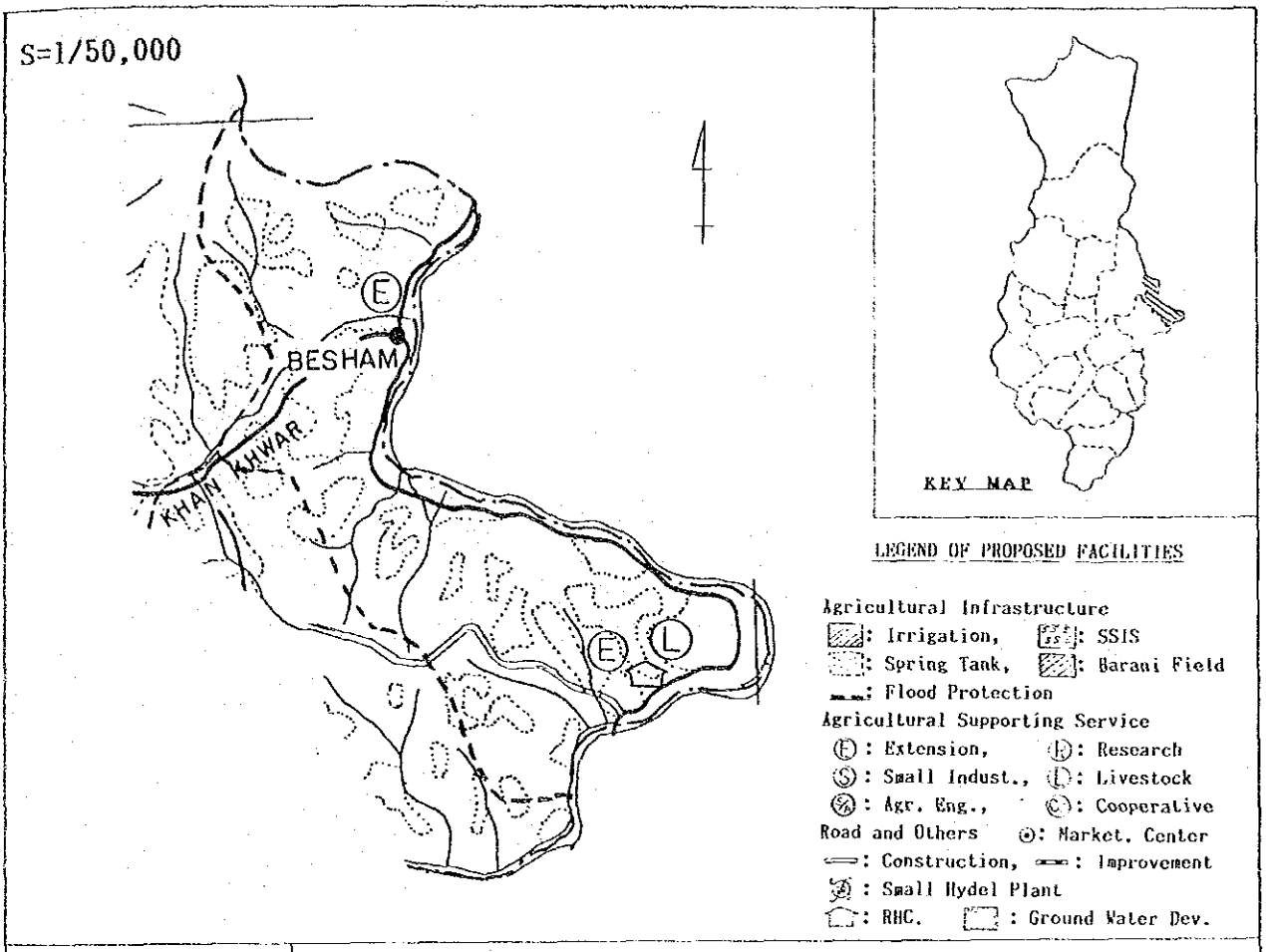


LEGEND OF PROPOSED FACILITIES

Agricultural Infrastructure
: Irrigation, : SSIS
: Spring Tank, : Barani Field
: Flood Protection
Agricultural Supporting Service
: Extension, : Research
: Small Indust., : Livestock
: Agr. Eng., : Cooperative
Road and Others : Market. Center
: Construction, : Improvement
: Small Hydel Plant
: RHC : Ground Water Dev.

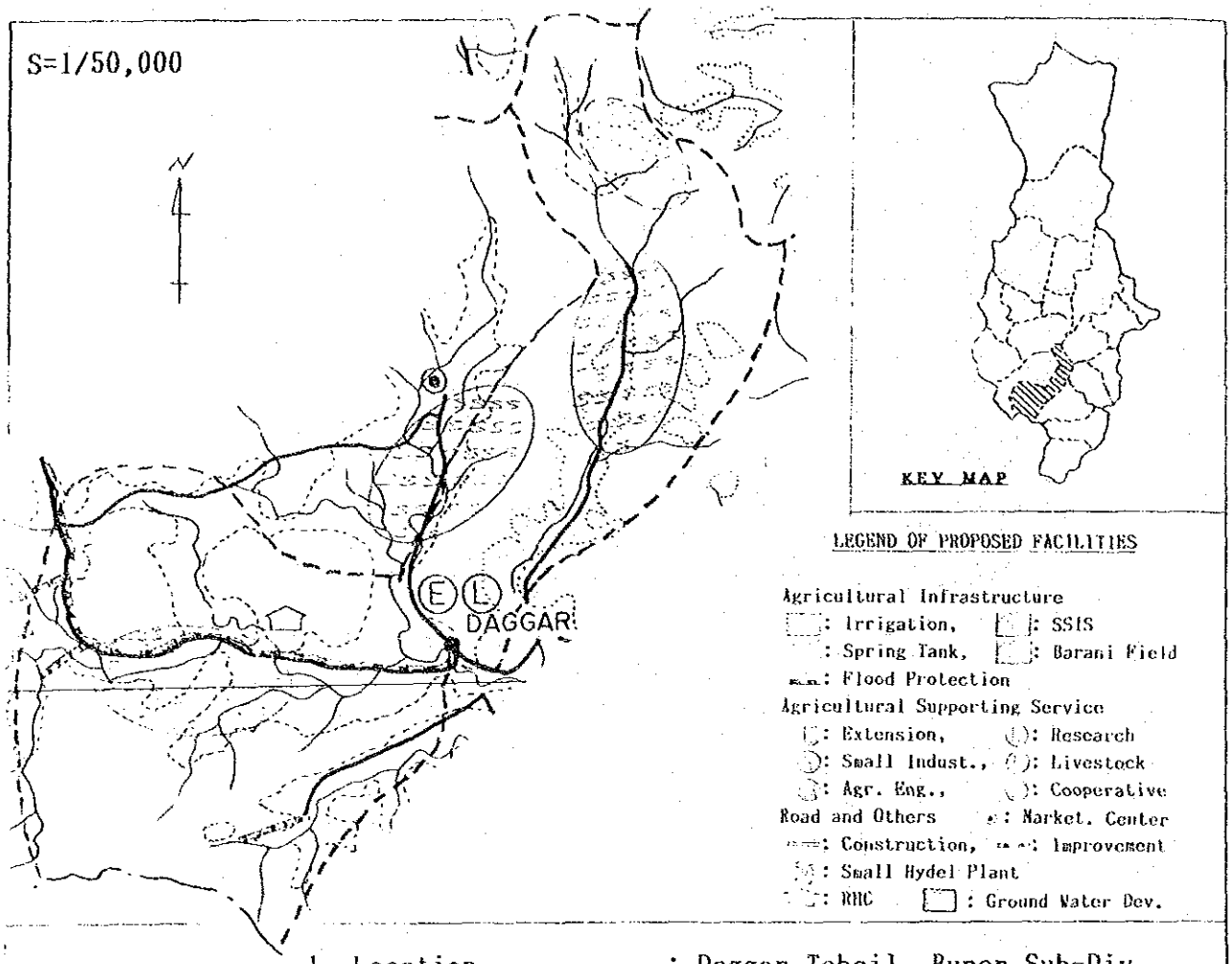
Description of Area	1. Location : Martung Teh. Shangla Par Sub-Div. 2. Area - Total Area : 17,140 ha - Cultivated Area : 4,510 ha 3. Population (1988) : 31,066 (181 person/sq.km) 4. No. of Village : 92
Description of Project	1. Proposed Development Works: - Agr.Infrastructure: SSIS(6 No.), Tank(10 No.), Kabalgram - Agr.Supporting: Agricultural Training Center, Tractor Station, Marketing Sub-center, etc. - Road: Improvement/Construction(25.0 km) - Electrification: Micro Hydel Station(200 kw), WAPDA Extension(5,900 houses) - Water Supply: New Schemes(4,600 houses) - Rural Infra.: Schools Impr./Const.(79 schools), BHU,RHC Impr./Const.(6 No),Ambulance, Latrines(1,600 houses) 2. Total Development Cost: Rs. 313.4 million

FIGURE G-14 MAJOR FEATURES OF BESHAM SUB-PROJECT



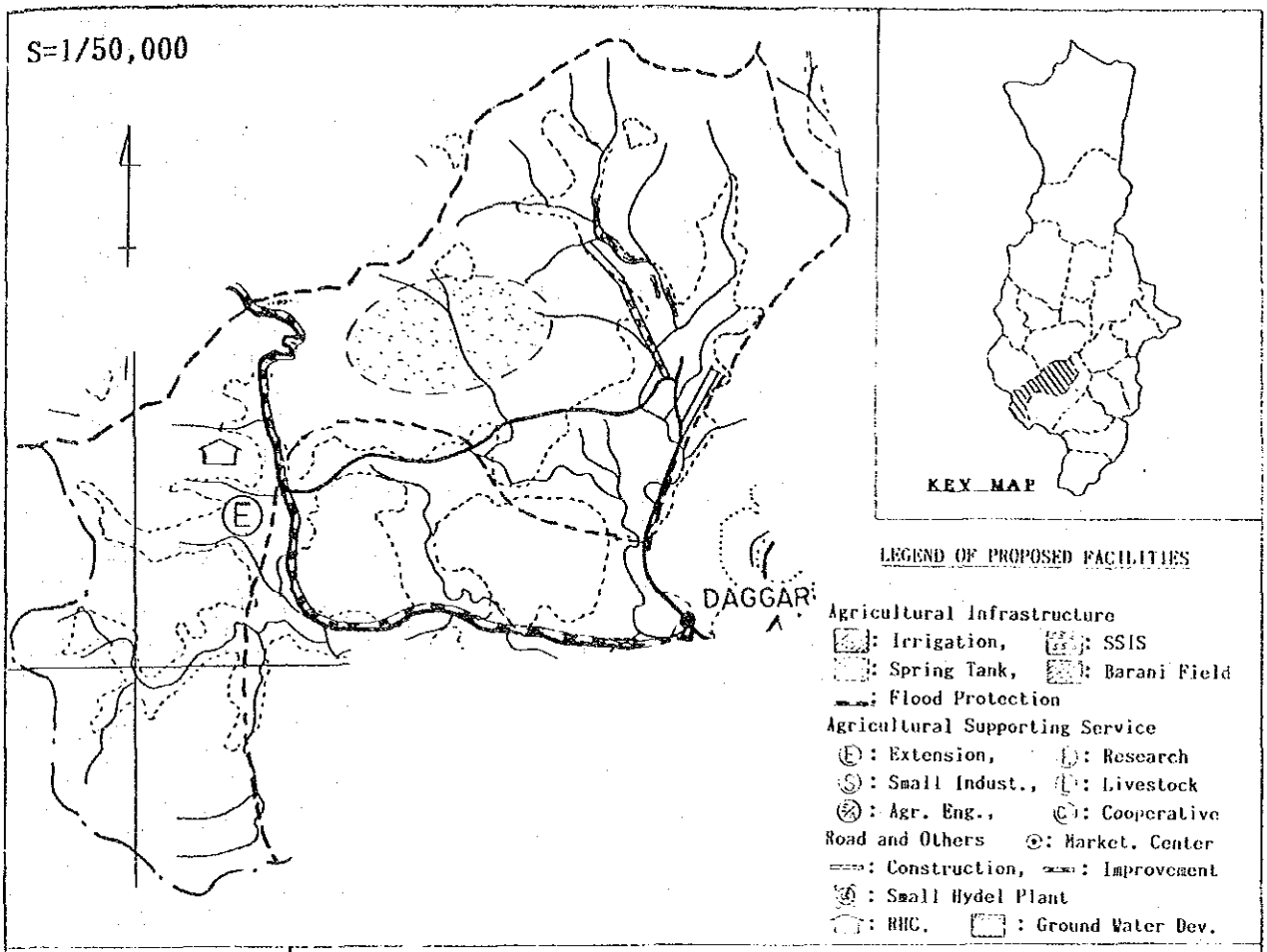
Description of Area	1. Location : Besham Teh. Shangla Par Sub-Div. 2. Area - Total Area : 16,890 ha - Cultivated Area : 5,300 ha 3. Population (1988) : 46,850 (277 person/sq.km) 4. No. of Village : 64
Description of Project	1. Proposed Development Works: - Agr.Infrastructure: SSIS(6 No.), Tank(10 No.) - Agr.Supporting: Agri. Training Center, Extension F.A Offi. - Road: Improvement/Construction(20.0 km) - Electrification: WAPDA Extension(9,400 houses) - Water Supply: New Schemes(7,100 houses) - Rural Infra.: Schools Impr./Const.(129 schools), BHU,RHC Impr./Const.(9 No), Latrines(2,600 houses) 2. Total Development Cost: Rs. 287.4 million

FIGURE G-15 MAJOR FEATURES OF DAGGAR SUB-PROJECT



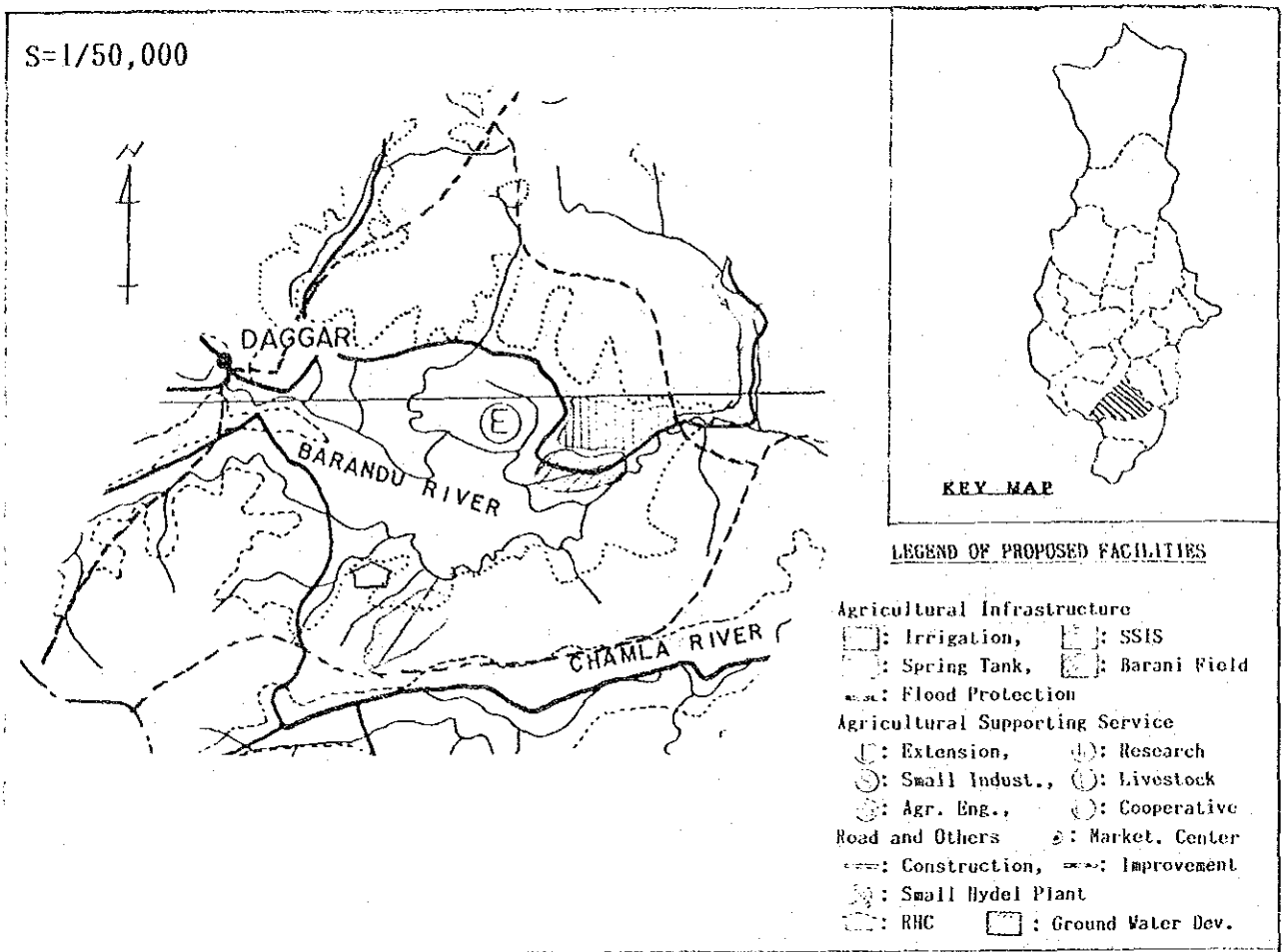
Description of Area	1. Location : Daggar Tehsil, Buner Sub-Div. 2. Area - Total Area : 31,270 ha - Cultivated Area : 10,150 ha 3. Population (1988) : 65,293 (209 person/sq.km) 4. No. of Village : 94
Description of Project	1. Proposed Development Works: - Agr.Infrastructure: SSIS(6 No.), Spring Tank(7 No.), Ground Water(5 No.) - Agr.Supporting: Fruit & Veg.District Office, Bee Keeping Center, Veterinary Hospital, etc. - Road: Improvement/Construction(64.0 km) - Electrification: WAPDA Extension(8,300 houses) - Water Supply: New Schemes(9,000 houses) - Rural Infra.: Schools Impr./Const.(167 schools), BHU,RHC Impr./Const.(12 No), Latrines(3,200 houses) 2. Total Development Cost: Rs. 455.0 million

FIGURE G-16 MAJOR FEATURES OF GADEZAI SUB-PROJECT



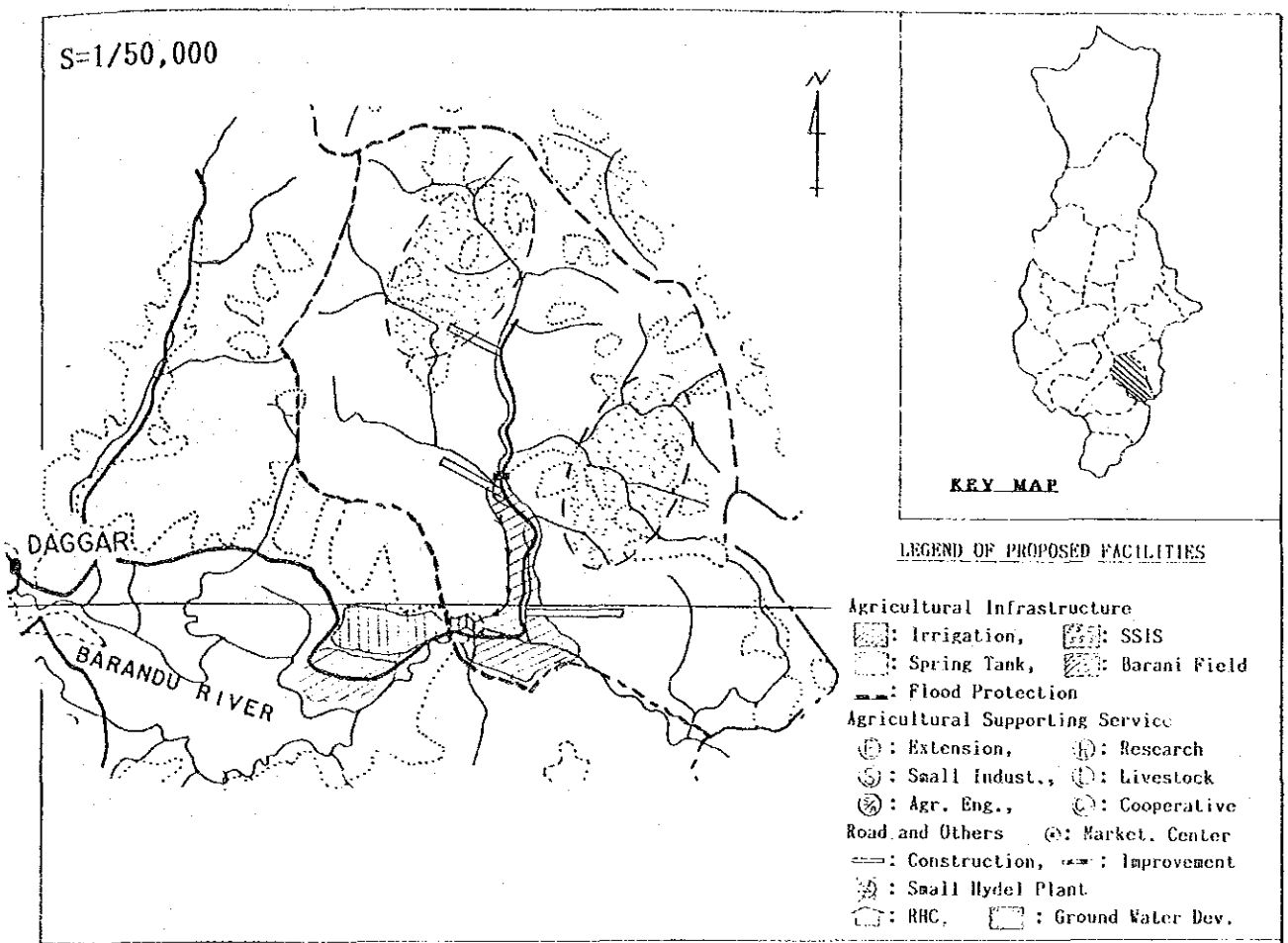
Description of Area	1. Location : Gadezai Tehsil, Buner Sub-Div. 2. Area - Total Area : 39,190 ha - Cultivated Area : 10,530 ha 3. Population (1988) : 64,840 (165 person/sq.km) 4. No. of Village : 42
Description of Project	1. Proposed Development Works: - Agr.Infrastructure: SSIS(6 No.), Spring Tank(6 No.), Ground Water(5 No.) - Agr.Supporting: Fruit & Veg.Training Office, Marteking Sub-center, Agricultural Insemination Sub-Center, - Road: Improvement/Construction(10.5 km) - Electrification: WAPDA Extension(7,600 houses) - Water Supply: New Schemes(8,100 houses) - Rural Infra.: Schools Impr./Const.(166 schools), BHU,RHC Impr./Const.(12 No), Latrines(3,200 houses) 2. Total Development Cost: Rs. 314.2 million

FIGURE G-17 MAJOR FEATURES OF GAGRA SUB-PROJECT



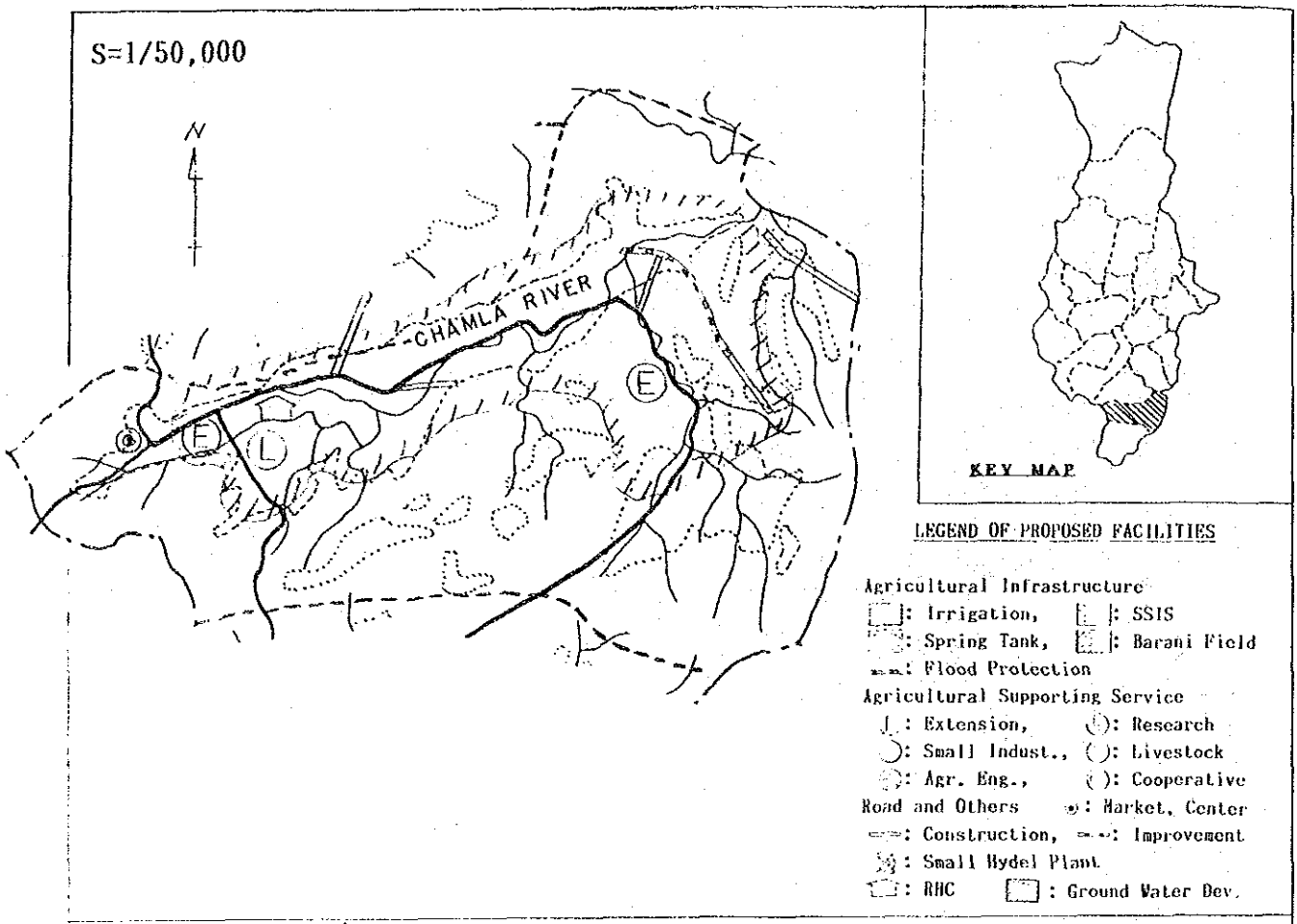
Description of Area	1. Location : Gagra Tehsil, Buner Sub-Div. 2. Area - Total Area : 27,920 ha - Cultivated Area : 6,320 ha 3. Population (1988) : 51,700 (185 person/sq.km) 4. No. of Village : 62
Description of Project	1. Proposed Development Works: - Agr.Infrastructure: SSIS(6 No.), Spring Tank(7 No.), Ground Water(5 No.), Budar, Kar Shalizara Schemes - Agr.Supporting: Fruit & Veg.Training Office, Artifical Insemination Sub-Center - Road: Improvement/Construction(10.0 km) - Electrification: WAPDA Extension(5,100 houses) - Water Supply: New Schemes(4,900 houses) - Rural Infra.: Schools Impr./Const.(132 schools), BHU,RHC Impr./Const.(10 No), Latrines(2,400 houses) 2. Total Development Cost: Rs. 251.7 million

FIGURE G-18 MAJOR FEATURES OF CHAGHRZAI SUB-PROJECT



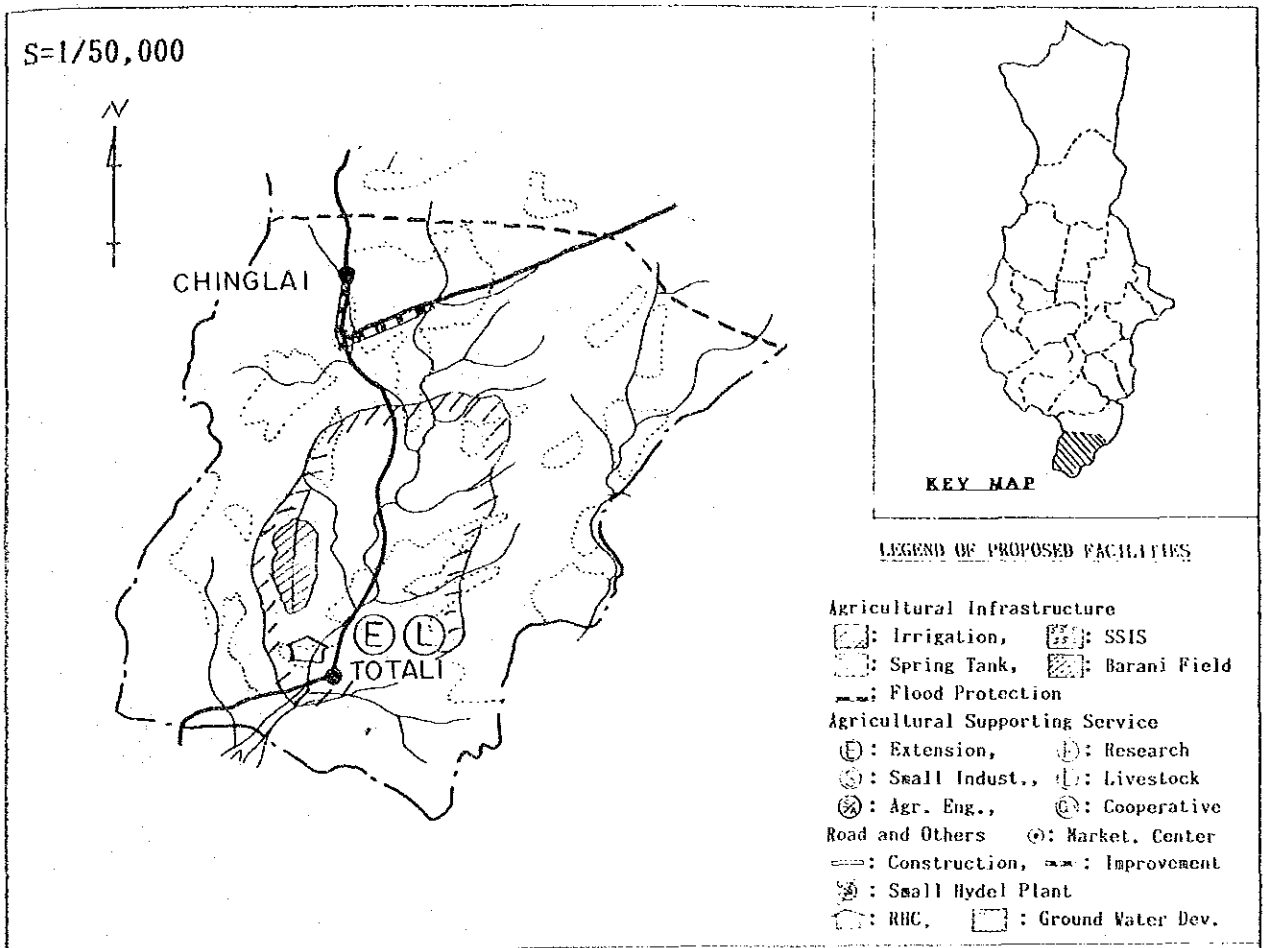
Description of Area	1. Location : Chaghrzai Tehsil Buner Sub-Div. 2. Area - Total Area : 24,550 ha - Cultivated Area : 8,940 ha 3. Population (1988) : 46,793 (191 person/sq.km) 4. No. of Village : 156
Description of Project	1. Proposed Development Works: - Agr.Infrastructure: SSIS(6 No.), Spring Tank(6 No.), Ground Water(5 No.) - Agr.Supporting: Agri.Training Center, Extension F.A Office - Road: Improvement/Construction(15.0 km) - Electrification: WAPDA Extension(8,900 houses) - Water Supply: New Schemes(6,100 houses) - Rural Infra.: Schools Impr./Const.(120 schools), BHU,RHC Impr./Const.(11 No),Ambulance, Latrines(2,400 houses) 2. Total Development Cost: Rs. 282.5 million

FIGURE G-19 MAJOR FEATURES OF CHAMLA/AMAZAI SUB-PROJECT



Description of Area	1. Location : Chamla/Amazai Teh. Buner Sub-Div. 2. Area - Total Area : 30,800 ha - Cultivated Area : 9,410 ha 3. Population (1988) : 61,280 (199 person/sq.km) 4. No. of Village : 144
Description of Project	1. Proposed Development Works: - Agr.Infrastructure: SSIS(6 No.), Spring Tank(6 No.), Ground Water(5 No.), Barani Field Consolidation - Agr.Supporting: Fruit & Veg.Training Office, - Road: Improvement/Construction(36.0 km) - Electrification: WAPDA Extension(11,700 houses) - Water Supply: New Schemes(6,100 houses) - Rural Infra.: Schools Impr./Const.(157 schools), BHU,RHC Impr./Const.(11 No),Ambulance,Latrines(3,300 houses) 2. Total Development Cost: Rs. 449.5 million

FIGURE G-20 MAJOR FEATURES OF KHUDUKHEL SUB-PROJECT



Description of Area	1. Location : Khudukhelr Tehsil, Buner Sub-Div. 2. Area - Total Area : 31,970 ha - Cultivated Area : 9,850 ha 3. Population (1988) : 47,209 (148 person/sq.km) 4. No. of Village : 50
Description of Project	1. Proposed Development Works: - Agr.Infrastructure: SSIS(6 No.),Tank(6 No.),Ground Water (5 No.), Barani Field, Ghur Ghushot Scheme - Agr.Supporting: Fruit & Veg. Training Office, - Road: Improvement/Construction(15.0 km) - Electrification: WAPDA Extension(7,900 houses) - Water Supply: New Schemes(5,900 houses) - Rural Infra.: Schools Impr./Const.(121 schools), BHU,RHC Impr./Const.(9 No),Ambulance, Latrines(2,600 houses) 2. Total Development Cost: Rs. 359.0 million

CHAPTER II. COST ESTIMATION

2.1 Basic Rates and Unit Costs

Table G-1 Basic Rates of Labour

	Rs./Day
Laborer	35
Skilled Laborer	50
General Foreman	100
Carpenter	90
Mason	100
Steel Bender	100
Welder	100
Driver	50
Mechanic	75
Electrician	50
Driller	100
Blaster	70
Plumber	75
Batch Plant Operator	70
Watchman	45
Surveyor	100

Table G-2 Basic Rates of Material

	Description		Unit	Rs.	Remarks
1.	Crusher run 75-50 mm		m3	280	
2.	Crushed stone 20-15 mm		m3	260	concret
3.	Gravel 75-50 mm		m3	140	concret
4.	Sand		m3	105	
5.	Portland cement		bag	94	50 kg/bag
6.	White portland cement		bag	160	50 kg/bag
7.	Gypsum plaster		bag	200	
8.	Steel bar (deformed)		ton	12,000	
9.	Structural steel		ton	10,000	
10.	Common brick		1,000 pcs	800	
11.	Fired brick		1,000 pcs	1,500	
12.	Concrete brick		1,000 pcs	2,000	
13.	Timber		m3	5,000	
14.	Asphalt compound		ton	5,000	
15.	R.C. pipe	3"	m	60	
16.		8"	m	160	
17.		12"	m	240	
18.		20"	m	390	
19.	G.I. pipe	1/2"	m	27	
20.		3/4"	m	37	
21.		1"	m	49	
22.		1-1/2"	m	80	
23.		2"	m	101	
24.		4"	m	256	
25.		6"	m	516	
26.	PVC pipe	3/4"	m	10	
27.		1"	m	15	
28.		1-1/2"	m	30	
29.		2"	m	45	
30.		3"	m	64	
31.		4"	m	83	
32.	Diesel oil		ltr	4	
33.	Gasoline		ltr	8	
34.	Engine oil		ltr	15	

Table G-3 Foreign and Local Components

Unit: %

Description	Foreign Portion	Local Portion
1. Cement	60	40
2. Reinforcement Bar	80	20
3. Fuel and Oil	55	45
4. Construction Machinery	80	20
5. Truck and Vehicle	70	30
6. Repair of Machinery	70	30
7. Maintenance of Machinery	0	100
8. Timber	0	100
9. Explosive	80	20
10. Pump, Gate, Valve, etc.	95	5
11. Electrical Facilities	95	5
12. Metal and Steel Product	75	25
13. Labour	0	100
14. Land Acquisition	0	100
15. Project Administration	40	60
16. Engineering Service	70	30

Table G-4 Unit Costs as Basis for Project Cost Estimation

Unit : Rs.'000

Item		Unit	Establish. Cost	O&M Cost per Annum
Agricultural Infrastructure Facilities	SSIS with Farm Pond	Rs./No.	2,938	44.1
	Spring Water Tank	Rs./No.	282	4.2
	Ground Water Devel.	Rs./No.	1,065	16.0
	Imp. Exist. Facilities	Rs./100 ha	610	9.1
	Flood Control	Rs./km	5,330	80.0
Agricultural Supporting Service Facilities	Agr. Training Centre	Rs./No.	745	128.9
	Extension (F.A.)	Rs./No.	556	90.3
	Seed Farm	Rs./No.	2,145	576.9
	Fruit Nursery Station	Rs./No.	980	259.6
	F & V Training Office	Rs./No.	370	97.4
	Bee Keeping Centre	Rs./No.	2,276	490.1
	Veterinary Hospital	Rs./No.	1,398	281.2
	Natural Breed. Centre	Rs./No.	480	39.0
	Artificial Insem. Centre	Rs./No.	1,005	126.9
	A.I. Sub-Centre	Rs./No.	766	70.5
	Animal Nutrition Imp.	Rs./No.	706	189.3
	Poultry Hatchery	Rs./No.	3,827	184.8
	Tractor Station	Rs./No.	4,500	990.0
	Main Marketing Centre	Rs./No.	4,980	99.6
	Marketing Sub-Centre	Rs./No.	1,260	25.2
Road and Communication	Const. 12' Shingle Rd.	Rs./km	523	52.3
	Imp./Pave. 12' Rd.	Rs./km	1,039	51.9
	Const. 12' Pave. Rd.	Rs./km	1,183	59.1
	Imp. 12' to 20' Rd.	Rs./km	1,670	83.5
Rural Electrification	Extent. WAPDA T.M.L.	Rs./House	5	0.1
	Micro Hydel	Rs./200 kw	14,000	280.0
Water Supply Facilities	Gravity System	Rs./1000 H	4,100	68.0
	Tube Well System	Rs./1000 H	4,100	160.0
Rural Infrastructure Facilities	Imp./Upgrad. School	Rs./School	349	9.0
	Construction School	Rs./School	413	10.3
	Imp./Upgrad. BHU, etc.	Rs./No.	565	19.3
	Construction BHU		485	19.7
	Construction RHC		830	36.6
	Staffing Doctor	Rs./Doctor	252	43.2
	Ambulance	Rs./No.	385	72.6
	Latrine	Rs./100No.	535	-

Note: H; Houses

2.2 Cost Estimation of Master Plan Project

2.2.1 Development Cost of Master Plan Project

Table G-5 Summary of Development Cost of Master Plan Project

Cost Unit: Rs.'000

Description	90-95	95-00	00-05	Total	
Agricultural Infrastructure Development					
1. New Irrigation Schemes	250,753	162,640	155,554	568,947	
2. Improv./Extension of Irrigation Schems	115,107	115,229	101,590	331,926	
3. Barani Field Consolidation	0	98,000	98,000	196,000	
4. Flood Control & Land Protection	41,574	53,300	53,300	148,174	
Sub-total	407,434	429,169	408,444	1,245,047	18 %
Agricultural Supporting Service Develop.					
1. Research	5,660	9,245	600	15,505	
2. Extension & Seed Multiplication	86,609	21,511	21,374	129,494	
3. Livestock & Poultry	29,547	22,637	18,104	70,288	
4. Agricultural Eng. & Soil Conservation	24,206	5,353	5,353	34,912	
5. Cooperatives & Input Supply	2,301	785	0	3,086	
6. Small Industry	6,078	10,963	0	17,041	
7. Marketing Facilities	8,760	8,760	3,780	21,300	
Sub-total	163,161	79,254	49,211	291,626	4 %
Road & Communication Development					
1. Road Improvement/Construction	579,811	206,645	123,168	909,624	
2. Wireless Telephone System	29,000	0	0	29,000	
Sub-total	608,811	206,645	123,168	938,624	14 %
Rural Electrification Development					
1. Extension of WAPDA T/H Line	145,000	343,500	581,000	1,069,500	
2. Micro Hydel Power Stations	53,250	14,000	0	67,250	
Sub-total	198,250	357,500	581,000	1,136,750	17 %
Village Water Supply Development					
1. Village Water Supply Schemes	241,080	289,460	297,660	828,200	
Sub-total	241,080	289,460	297,660	828,200	12 %
Rural Infrastructure Development					
1. Education Facilities	402,553	408,492	666,169	1,477,214	
2. Health Facilities	73,182	92,541	96,682	262,405	
3. Sanitation Facilities	73,172	97,370	228,980	399,522	
Sub-total	548,907	598,403	991,831	2,139,141	32 %
Village Community Development					
1. Minor Works Programme	48,576	58,650	58,650	165,876	
Sub-total	48,576	58,650	58,650	165,876	2 %
Direct Construction Cost Total	2,216,219	2,019,081	2,509,964	6,745,264	100 %
Land Acquisition, Compensation(5%, D.C.C.)	110,811	100,954	125,498	337,263	
Project Administrarion Cost(10%, D.C.C.)	221,622	201,908	250,996	674,526	
Engineering Service Cost(15%, D.C.C.)	332,433	302,862	376,495	1,011,790	
Indirect Cost Total	664,866	605,724	752,989	2,023,579	
Direct & Indirect Cost Total	2,881,085	2,624,805	3,262,953	8,768,843	
Contingency(20%)	576,217	524,961	652,591	1,753,769	
Project Cost(1989 Price)	3,457,302	3,149,766	3,915,544	10,522,612	
Price Escalation(Av. 5.0%/year)	448,503	1,391,721	3,289,860	5,130,084	
Project Cost Total	3,905,805	4,541,487	7,205,404	15,652,696	

Table G-6(1) Development Cost of Agricultural Infrastructure

Cost Unit: Rs.'000

Description	Unit	1990-1995		1995-2000		2000-2005		Total	
		Q'ty	Cost	Q'ty	Cost	Q'ty	Cost	Q'ty	Cost
New Irrigation Schemes									
1. Ushorso Irrg. Scheme(Kalam)	ha	120	625					120	625
2. Budar Irrig. Scheme(Gagra)	ha	1,520	9,604					1,520	9,604
3. Kar Shalizara Scheme(Gagra)	ha	42	1,352					42	1,352
4. Ghur Ghushot Lift Irrig.(Khudukhel)	ha	49	1,213					49	1,213
5. Kotkai SSIP(Alpuri)	ha	150	16,524					150	16,524
6. Kabalgram Irrig. Scheme(Martung)	ha					320	38,034	320	38,034
7. SSIS	No.	40	117,520	40	117,520	40	117,520	120	352,560
8. Spring Water Tank	No.	75	21,150	75	21,150			150	42,300
9. Ground Water Development	No.	15	15,975	15	15,975			30	31,950
10. Sandal Aloch Irrg. & Hydel(Puran)	ha	352	9,790					352	9,790
11. Choga Irrig. & Hydel(Puran)	ha			170	3,670			170	3,670
12. Chakesar Irrig. & Hydel(Chakesar)	ha			110	4,325			110	4,325
13. Swat River Basin Irrig. Agr. Develop.	L.S.	*	57,000	-	**	-	**	-	57,000
Sub-total			250,753		162,640		155,554		568,947
Improvement/Extension Irrigation Schemes									
1. Imp. Existing Facilities(Mingora)	ha	500	3,050	500	3,050	500	3,050	1,500	9,150
2. Extension Nipki Khel Canal(Kanju)	ha	1,315	13,639	1,315	13,639			2,630	27,278
3. Barral Khwar Imp/Flood Protect.(Matta)	ha	170	17,027	180	17,088	180	17,088	530	51,203
4. Harnol Khwar Imp/Flood Protect.(Matta)	ha	500	40,360	500	40,360	500	40,360	1,500	121,080
5. Deolai Khwar Imp/Flood Protect.(Kabal)	ha	500	29,700	500	29,700	500	29,700	1,500	89,100
6. Kana Khwar Imp/Flood Protect.(Alpuri)	ha	110	11,331	120	11,392	120	11,392	350	34,115
Sub-total			115,107		115,229		101,590		331,926
Barani Field Consolidation									
1. Swat Sub-Div.(Kabal, Barikot, Kanju)	ha			2,100	38,000	2,100	38,000	4,200	76,000
2. Buner Sub-Div.(Chagla, Khudukel)	ha			3,300	60,000	3,300	60,000	6,600	120,000
Sub-total					98,000		98,000		196,000
Flood Control & Land Protection									
1. Swat River	km	3.8	41,574	10.0	53,300	10.0	53,300	27.8	148,174
Sub-total			41,574		53,300		53,300		148,174
Total			407,434		429,169		408,444		1,245,047

Note: *; Master Plan and F/S Study, **; Cost should be estimated by the Study

Table G-6(2) Development Cost of Agricultural Supporting Service

Cost Unit: Rs.'000

Description	Unit	1990-1995		1995-2000		2000-2005		Total	
		Q'ty	Cost	Q'ty	Cost	Q'ty	Cost	Q'ty	Cost
Research									
1. Soil Survey; Medium Scale	ha	200,000	600	200,000	600	200,000	600	600,000	1,800
2. Soil Survey; Detailed	ha	15,000	570	15,000	570			30,000	1,140
3. Soil Servey; Equipment	L.S.	-	1,200					-	1,200
4. Establishment of Sub-station(Kalam)	No.	1	3,290					1	3,290
5. Upgrading of Exist. Station(Mingora)	No.			1	8,075			-	8,075
Sub-total			5,680		9,245		600		15,505
Extension & Seed Multiplication									
1. Establishment of ATTD Farm	L.S.	-	55,793	-	3,700	-	2,220	-	61,713
2. Agricultural Training Centre	No.	5	3,725	5	3,725	6	4,470	16	11,920
3. Imp/Estab. Extension Facilities(F.A.)	No.	17	9,452	17	9,452	18	10,008	52	28,912
4. Establishment of Seed farm	No.	4	8,580					4	8,580
5. Transportation for Extension	No.	21	798	20	638	22	680	63	2,116
6. Establish. of Fruits Nursery Station	No.	1	980	1	980	1	980	3	2,940
7. F & V Develop. D. O. Office(Daggar)	No.	1	2,785					1	2,785
8. F & V Training Offices	No.	6	2,220	2	740	2	740	10	3,700
9. Establish. of Bee Keeping Center	No.	1	2,276	1	2,276	1	2,276	3	6,828
Sub-total			86,609		21,511		21,374		129,494
Livestock & Poultry									
1. Establish. of Veterinary Hospitals	No.	4	5,592	1	1,398	1	1,398	6	8,388
2. Estab. of Natural Breeding Centres	No.	3	1,440	3	1,440	3	1,440	9	4,320
3. Estab.Artificial Insemination Centres	No.	2	2,010					2	2,010
4. Estab.Artificial Inseml. Sub-Centres	No.	1	766	1	766	1	766	3	2,298
5. Animal Nutrition Improv. Centres	No.	2	1,412	1	706			3	2,118
6. Establish. of Poultry Hatchery	No.	1	3,827	1	3,827			2	7,654
5. Animal Distribution	L.S.	-	14,500	-	14,500	-	14,500	-	43,500
Sub-total			29,547		22,637		18,104		70,288
Agricultural Eng. & Soil Conservation									
1. Establish. Soil Conservation Project	L.S.	-	10,706	-	5,353	-	5,353	0	21,412
2. Establishment of Tractor Stations	No.	3	13,500					3	13,500
Sub-total			24,206		5,353		5,353		34,912
Cooperatives & Input Supply									
1. Establishment of Inspector Offices	No.	1	785	1	785			2	1,570
2. Establishment of Cooperative Bank	No.	1	816					1	816
3. Establish. of Agr. Inputs Warehouse	No.	1	700					1	700
Sub-total			2,301		785		0		3,086
Small Industry									
1. Estab. of Fruits Processing Factory	No.			1	7,545			1	7,545
2. Estab. of Wood Craft Training Centre	No.			1	3,418			1	3,418
3. Estab. of Gabion Factory	No.	1	4,263					1	4,263
4. Estab. of Women Handicraft Centre	No.	1	1,815					1	1,815
Sub-total			6,078		10,963		0		17,041
Marketing Facilities									
1. Estab. of Main Marketing Centre	No.	1	4,980					1	4,980
2. Estab. of Marketing Centres	No.			2	4,980			2	4,980
3. Estab. of Marketing Sub-Centres	No.	3	3,780	3	3,780	3	3,780	9	11,340
Sub-total			8,760		8,760		3,780		21,300
Total			163,161		79,254		49,211		291,626

Table G-6(3) Development Cost of Road and Communication

Cost Unit: Rs.'000

Description	Unit	1990-1995		1995-2000		2000-2005		Total	
		Q'ty	Cost	Q'ty	Cost	Q'ty	Cost	Q'ty	Cost
Road Improvement/Construction									
1. 12' Shingle Road Construction	km	77.0	40,271	73.0	38,179	131.0	68,513	281.0	146,963
2. 12' B/T Road Construction	km	0.0	0	15.0	17,745	26.0	30,758	41.0	48,503
3. 12' Road Improvement & B/T	km	170.5	177,150	87.2	90,601	23.0	23,897	280.7	291,647
4. 20' Road Improvement & B/T	km	217.0	362,390	36.0	60,120	0.0	0	253.0	422,510
Sub-total		464.5	579,811	211.2	206,645	180.0	123,168	855.7	909,623
Telecommunication									
1. Estab. of Wireless Telephone System	L.S.	-	29,000					-	29,000
Sub-total			29,000						29,000
Total			608,811		206,645		123,168		938,623

Table G-6(4) Development Cost of Rural Electrification

Cost Unit: Rs.'000

Description	Unit	1990-1995		1995-2000		2000-2005		Total	
		Q'ty	Cost	Q'ty	Cost	Q'ty	Cost	Q'ty	Cost
Extention of WAPDA T/M Line	Houses	29,000	145,000	68,700	343,500	116,200	581,000	213,900	1,069,500
Micro Hydel Power									
1. Micro Hydel Power Stations(Kalam)	kw	400	28,000	200	14,000			600	42,000
2. Micro Hydel Power Station(Martung)	kw	200	25,250					200	25,250
Sub-total			53,250		14,000				67,250
Total			198,250		357,500		581,000		1,136,750

Table G-6(5) Development Cost of Village Water Supply

Cost Unit: Rs.'000

Description	Unit	1990-1995		1995-2000		2000-2005		Total	
		Q'ty	Cost	Q'ty	Cost	Q'ty	Cost	Q'ty	Cost
Village Water Supply System	Houses	58,800	241,080	70,600	289,460	72,600	297,660	202,000	828,200
Total			241,080		289,460		297,660		828,200

Table G-6(6) Development Cost of Rural Infrastructure

Cost Unit: Rs.'000

Description	Unit	1990-1995		1995-2000		2000-2005		Total	
		Q'ty	Cost	Q'ty	Cost	Q'ty	Cost	Q'ty	Cost
Education Facilities									
1. Imp./Upgrading Exist. Facilities	No.	815	284,435	406	141,694			1,221	426,129
2. Construction of Primary Schools	No.	286	118,118	646	266,798	1,613	666,169	2,545	1,051,085
Sub-total			402,553		408,492		666,169		1,477,214
Health Facilities									
1. Imp./Upgrading Exist. Facilities	No.	78	44,070	65	36,725			143	80,795
2. Construction of BHUs	No.	24	11,640	34	16,490	52	25,220	110	53,350
3. Upgrading BHUs to RHCs	No.			7	5,810	19	15,770	28	21,580
4. Const. of Residence for Doctors	No.	51	12,852	133	33,516	221	55,692	405	102,060
5. Ambulances	No.	12	4,620					12	4,620
Sub-total			73,182		92,541		96,682		262,405
Sanitation Facilities									
1. Establishment of Office	L.S.	-	1,482					1	1,482
2. Construction of Latrines	Houses	13,400	71,690	18,200	97,370	42,800	228,980	74,400	398,040
Sub-total			73,172		97,370		228,980		399,522
Total			548,907		598,403		991,831		2,139,141

2.2.2 O & M Cost of Master Plan Project

Table G-7 Summary of O & M Cost of Master Plan Project

Cost Unit: Rs.'000

Description	90-95	95-00	00-05	Total	
Agricultural Infrastructure Development					
1. New Irrigation Schemes	8,717	21,863	33,756	64,336	
2. Improv./Extension of Irrigation Schems	5,179	13,816	21,844	40,839	
3. Barani Field Consolidation	0	5,880	15,680	21,560	
4. Flood Control & Land Protection	1,871	5,517	9,514	16,902	
Sub-total	15,767	47,076	80,794	143,637	5 %
Agricultural Supporting Service Develop.					
1. Research	2,419	6,676	8,439	17,534	
2. Extension & Seed Multiplication	50,237	95,704	115,457	261,398	
3. Livestock & Poultry	6,389	13,176	16,268	35,833	
4. Agricultural Eng. & Soil Conservation	17,170	32,746	39,629	89,545	
5. Cooperatives & Input Supply	1,902	3,973	4,509	10,384	
6. Small Industry	2,743	10,629	14,668	28,040	
7. Marketing Facilities	526	1,402	1,979	3,907	
Sub-total	81,386	164,306	200,949	446,641	15 %
Road & Communication Development					
1. Road Improvement/Construction	92,987	191,686	244,903	529,576	
2. Wireless Telephone System	0	6,375	6,375	12,750	
Sub-total	92,987	198,061	251,278	542,326	18 %
Rural Electrification Development					
1. Extension of WAPDA T/M Line	8,700	35,110	83,710	127,520	
2. Micro Hydel Power Stations	3,195	6,165	6,725	16,085	
Sub-total	11,895	41,275	90,435	143,605	5 %
Village Water Supply Development					
1. Village Water Supply Schemes	20,110	57,661	98,587	176,358	
Sub-total	20,110	57,661	98,587	176,358	6 %
Rural Infrastructure Development					
1. Education Facilities	117,094	380,779	919,744	1,417,617	
2. Health Facilities	15,158	49,041	97,414	161,613	
3. Sanitation Facilities	1,160	1,934	1,934	5,028	
Sub-total	133,412	431,754	1,019,092	1,584,258	52 %
Village Community Development					
1. Minor Works Programme	0	0	0	0	
Sub-total	0	0	0	0	0 %
Sub-total	355,557	940,133	1,741,135	3,036,825	100 %
Contingency(20%)	71,111	188,027	348,227	607,365	
O & M Cost(1989 Price)	426,668	1,128,160	2,089,362	3,644,190	
O & M Cost per annum(1989 Price)	142,223	225,632	417,872	280,322	
Price Escalation(Av. 7.1 %/year)	79,814	758,926	2,835,364	3,674,104	
O & M Cost Total	506,482	1,887,085	4,924,726	7,318,294	
O & M Cost per annum	168,827 (3 years)	377,417 (5 years)	984,945 (5 years)	562,946 (13 years)	

Table G-8(1) O & M Cost of Agricultural Infrastructure

Cost Unit: Rs.'000

Description	Unit	1990-1995		1995-2000		2000-2005		Total	
		Q'ty	Cost	Q'ty	Cost	Q'ty	Cost	Q'ty	Cost
New Irrigation Schemes									
1. Ushoran Irrg. Scheme(Kalam)	ha	120	28	120	42	120	42	120	122
2. Budar Irrig. Scheme(Gagra)	ha	1,520	432	1,520	721	1,520	721	1,520	1,873
3. Kar Shalizara Scheme(Gagra)	ha	42	61	42	102	42	102	42	264
4. Ghur Ghushot Lift Irrig.(Khudukhel)	ha	49	55	49	91	49	91	49	237
5. Kotkai SSIP(Alpuri)	ha	150	744	150	1,240	150	1,240	150	3,223
6. Kabalgram Irrig. Scheme(Kartung)	ha					320	1,712	320	1,712
7. SSIS	No.	40	5,292	80	14,112	120	22,932	120	42,336
8. Spring Water Tank	No.	75	945	150	2,520	150	3,150	150	6,615
9. Ground Water Development	No.	15	720	30	1,920	30	2,400	30	5,040
10. Sandai Aloch Irrg. & Hydel(Puran)	ha	352	441	352	735	352	735	352	1,910
11. Choga Irrig. & Hydel(Puran)	ha			170	165	170	276	170	441
12. Chakesar Irrig. & Hydel(Chakesar)	ha			110	212	110	353	110	565
13. Swat River Basin Irrig. Agr. Develop.	L.S.	*	0	-	**	-	**	-	0
Sub-total			8,717		21,863		33,756		64,337
Improvement/Extension Irrigation Schemes									
1. Imp. Existing Facilities(Mingora)	ha	500	137	1,000	364	1,500	592	1,500	1,092
2. Extension Kipki Khel Canal(Kanju)	ha	1,315	614	2,630	1,637	2,630	2,046	2,630	4,297
3. Barwal Khwar Imp/Flood Protect.(Matta)	ha	170	766	350	2,046	530	3,328	530	6,140
4. Harnoi Khwar Imp/Flood Protect.(Matta)	ha	500	1,816	1,000	4,843	1,500	7,870	1,500	14,530
5. Daolai Khwar Imp/Flood Protect.(Kabal)	ha	500	1,337	1,000	3,564	1,500	5,792	1,500	10,692
6. Kana Khwar Imp/Flood Protect.(Alpuri)	ha	110	510	230	1,362	350	2,217	350	4,089
Sub-total			5,179		13,816		21,844		40,839
Barani Field Consolidation									
1. Swat Sub-Div.(Kabal, Barikot, Kanju)	ha			2,100	2,280	4,200	6,060	4,200	8,360
2. Buner Sub-Div.(Chamla, Khudukel)	ha			3,300	3,600	6,600	9,600	6,600	13,200
Sub-total					5,880		15,680		21,560
Flood Control & Land Protection									
1. Swat River	km	7.8	1,871	17.8	5,517	27.8	9,514	27.8	16,901
Sub-total			1,871		5,517		9,514		16,901
Total			15,767		47,076		80,794		143,637

Note: *; Master Plan and F/S Study, **; Cost should be estimated by the Study

Table G-8(2) O & M Cost of Agricultural Supporting Service

Cost Unit: Rs.'000

Description	Unit	1990-1995		1995-2000		2000-2005		Total	
		Q'ty	Cost	Q'ty	Cost	Q'ty	Cost	Q'ty	Cost
Research									
1. Soil Survey; Medium Scale	ha	200,000	0	200,000	0	200,000	0	600,000	0
2. Soil Survey; Detailed	ha	15,000	0	15,000	0			30,000	0
3. Soil Servey; Equipment	L.S.	-	720	-	1,200	-	1,200	-	3,120
4. Establishment of Sub-station(Kalam)	No.	1	1,699	1	2,831	1	2,831	1	7,361
5. Upgrading of Exist. Station(Mingora)	No.			1	2,645	1	4,408	1	7,052
Sub-total			2,419		6,676		8,439		17,533
Extension & Seed Multiplication									
1. Establishment of ATTD Farm	L.S.	-	30,612	-	53,240	-	56,052	-	139,904
2. Agricultural Training Centre	No.	5	1,934	10	5,156	16	8,765	16	15,855
3. Imp/Estab. Extension Facilities(F.A.)	No.	17	4,605	34	12,281	52	20,227	52	37,113
4. Establishment of Seed Farm	No.	4	6,923	4	11,538	4	11,538	4	29,999
5. Transportation for Extension	No.	21	479	41	1,181	63	1,844	63	3,504
6. Establish. of Fruits Nursery Station	No.	1	779	2	2,077	3	3,375	3	6,230
7. F & V Develop. D. O. Office(Dargai)	No.	1	1,683	1	2,805	1	2,805	1	7,292
8. F & V Training Offices	No.	6	1,753	8	3,506	10	4,480	10	9,740
9. Establish. of Bee Keeping Center	No.	1	1,420	2	3,921	3	5,371	3	11,762
Sub-total			50,237		95,704		115,457		261,399
Livestock & Poultry									
1. Establish. of Veterinary Hospitals	No.	4	3,374	5	5,468	6	7,814	6	17,316
2. Estab. of Natural Breeding Centres	No.	3	351	6	936	9	1,521	9	2,808
3. Estab.Artificial Insemination Centres	No.	2	761	2	1,269	2	1,269	2	3,299
4. Estab.Artificial Insemi. Sub-Centres	No.	1	212	2	564	3	917	3	1,692
5. Animal Nutrition Improv. Centres	No.	2	1,136	3	2,461	3	2,840	3	6,436
6. Establish. of Poultry Hatchery	No.	1	554	2	1,478	2	1,848	2	3,881
5. Animal Distribution	L.S.	-	0	-	0	-	0	-	0
Sub-total			6,389		13,176		16,268		35,832
Agricultural Eng. & Soil Conservation									
1. Establish. Soil Conservation Project	L.S.	-	8,260	-	17,896	-	24,779	-	50,934
2. Establishment of Tractor Stations	No.	3	8,910	3	14,850	3	14,850	3	38,610
Sub-total			17,170		32,746		39,629		89,544
Cooperatives & Input Supply									
1. Establishment of Inspector Offices	No.	1	803	2	2,142	2	2,677	2	5,622
2. Establishment of Cooperative Bank	No.	1	859	1	1,432	1	1,432	1	3,722
3. Establish. of Agr. Inputs Warehouse	No.	1	240	1	400	1	400	1	1,040
Sub-total			1,902		3,973		4,509		10,384
Small Industry									
1. Estab. of Fruits Processing Factory	No.			1	4,053	1	6,755	1	10,807
2. Estab. of Wood Craft Training Centre	No.			1	2,005	1	3,342	1	5,347
3. Estab. of Gabion Factory	No.	1	1,966	1	3,277	1	3,277	1	8,519
4. Estab. of Women Handicraft Centre	No.	1	777	1	1,295	1	1,295	1	3,365
Sub-total			2,743		10,629		14,668		28,039
Marketing Facilities									
1. Estab. of Main Marketing Centre	No.	1	299	1	498	1	498	1	1,295
2. Estab. of Marketing Centres	No.			2	299	2	498	2	797
3. Estab. of Marketing Sub-Centres	No.	3	227	6	605	9	983	9	1,814
Sub-total			526		1,402		1,979		3,906
Total			81,384		164,305		200,947		446,636

Table G-8(3) O & M Cost of Road and Communication

Cost Unit: Rs.'000

Description	Unit	1990-1995		1995-2000		2000-2005		Total	
		Q'ty	Cost	Q'ty	Cost	Q'ty	Cost	Q'ty	Cost
Road Improvement/Construction									
1. 12' Shingle Road Construction	km	77.0	12,081	150.0	31,589	281.0	59,779	281.0	103,449
2. 12' B/T Road Construction	km	0.0	0	15.0	2,660	41.0	9,042	41.0	11,702
3. 12' Road Improvement & B/T	km	170.5	26,547	257.7	57,822	280.7	70,454	280.7	154,823
4. 20' Road Improvement & B/T	km	217.0	54,359	253.0	99,616	253.0	105,628	253.0	259,602
Sub-total		464.5	92,987	675.7	191,686	855.7	244,903	855.7	529,576
Telecommunication									
1. Estab. of Wireless Telephone System	L.S.	-	0	-	6,375	-	6,375	-	12,750
Sub-total			0		6,375		6,375		12,750
Total			92,987		198,061		251,278		542,326

Table G-8(4) O & M Cost of Rural Electrification

Cost Unit: Rs.'000

Description	Unit	1990-1995		1995-2000		2000-2005		Total	
		Q'ty	Cost	Q'ty	Cost	Q'ty	Cost	Q'ty	Cost
Extention of WAPDA T/M Line	Houses	29,000	8,700	97,700	35,110	213,900	83,710	213,900	127,520
Micro Hydel Power									
1. Micro Hydel Power Stations(Kalam)	kw	400	1,680	600	3,640	600	4,200	600	9,520
2. Micro Hydel Power Station(Martung)	kw	200	1,515	200	2,525	200	2,525	200	6,565
Sub-total			3,195		6,165		6,725		16,085
Total			11,895		41,275		90,435		143,605

Table G-8(5) O & M Cost of Village Water Supply

Cost Unit: Rs.'000

Description	Unit	1990-1995		1995-2000		2000-2005		Total	
		Q'ty	Cost	Q'ty	Cost	Q'ty	Cost	Q'ty	Cost
Village Water Supply System	Houses	58,800	20,110	129,400	57,661	202,000	98,587	202,000	176,358
Total			20,110		57,661		98,587		176,358

Table G-8(6) O & M Cost of Rural Infrastructure

Cost Unit: Rs.'000

Description	Unit	1990-1995		1995-2000		2000-2005		Total	
		Q'ty	Cost	Q'ty	Cost	Q'ty	Cost	Q'ty	Cost
Education Facilities									
1. Imp./Upgrading Exist. Facilities	No.	815	22,005	1,221	47,637	1,221	54,945	1,221	124,587
2. Construction of Primary Schools	No.	286	8,837	932	34,690	2,545	97,840	2,545	141,368
3. Staffing of Teachers	persons	1,904	86,251	5,317	298,452	13,386	766,959	13,386	1,151,662
Sub-total			117,094		380,779		919,744		1,417,616
Health Facilities									
1. Imp./Upgrading Exist. Facilities	No.	78	4,516	143	11,291	143	13,800	143	29,606
2. Construction of BHUs	No.	24	1,418	58	4,373	110	8,786	110	14,578
3. Upgrading BHUs to RHCs	No.			7	769	26	2,086	26	2,855
4. Const. of Residence for Doctors	No.	51	6,610	184	28,253	405	68,386	405	103,248
5. Ambulances	No.	12	2,614	12	4,356	12	4,356	12	11,326
Sub-total			15,158		49,041		97,414		161,613
Sanitation Facilities									
1. Establishment of Office	L.S.	-	1,160	-	1,934	-	1,934	-	5,027
2. Construction of Latrines	Houses	13,400	0	18,200	0	42,800	0	74,400	0
Sub-total			1,160		1,934		1,934		5,027
Total			133,412		431,754		1,019,091		1,584,256

2.3 Cost Estimation of SIRDP

2.3.1 Development Cost of SIRDP

Table G-9 Summary of Development Cost of SIRDP

Cost Unit: Rs.'000

Description	90-95	95-00	00-05	Total	F/C	L/C
Agricultural Infrastructure Development						
1. New Irrigation Schemes	31,648	29,853	55,662	117,163	70,298	46,865
Sub-total	31,648	29,853	55,662	117,163	70,298	46,865
Agricultural Supporting Service Develop.						
1. Research	1,377			1,377	964	413
2. Extension & Seed Multiplication	67,681			67,681	47,377	20,304
3. Livestock & Poultry	14,531	2,200	2,200	18,931	13,252	5,679
4. Agricultural Eng. & Soil Conservation	24,206			24,206	16,944	7,262
5. Cooperatives & Input Supply	2,301			2,301	1,611	690
6. Small Industry	1,815			1,815	1,271	545
7. Marketing Facilities	8,760			8,760	6,132	2,628
Sub-total	120,671	2,200	2,200	125,071	87,550	37,521
Road & Communication Development						
1. Road Improvement/Construction	138,917	29,811	30,857	199,585	139,710	59,876
2. Wireless Telephone System	29,000	0	0	29,000	23,200	5,800
Sub-total	167,917	29,811	30,857	228,585	162,910	65,676
Rural Electrification Development						
1. Extension of WAPDA T/M Line		31,850	98,980	130,830	91,581	39,249
2. Micro Hydel Power Stations	25,250			25,250	20,200	5,050
Sub-total	25,250	31,850	98,980	156,080	111,781	44,299
Village Water Supply Development						
1. Village Water Supply Schemes	35,260	27,880	28,290	91,430	64,001	27,429
Sub-total	35,260	27,880	28,290	91,430	64,001	27,429
Rural Infrastructure Development						
1. Education Facilities	35,240	38,780	61,120	135,140	67,570	67,570
2. Health Facilities	8,260	6,540	10,220	25,020	17,514	7,506
3. Sanitation Facilities	8,452	9,640	21,410	39,502	23,701	15,801
Sub-total	51,952	54,960	92,750	199,662	108,785	90,877
Village Community Development						
1. Minor Works Programme	4,224	5,100	5,100	14,424	0	14,424
Sub-total	4,224	5,100	5,100	14,424	0	14,424
Direct Construction Cost Total	436,922	181,654	313,839	932,415	605,324	327,091
Land Acquisition, Compensation(5%, D.C.C.)	21,846	9,083	15,692	46,621	0	46,621
Project Administrarion Cost(10%, D.C.C.)	43,692	18,165	31,384	93,242	37,297	55,945
Engineering Service Cost(15%, D.C.C.)	65,538	27,248	47,076	139,862	97,904	41,959
Indirect Cost Total	131,077	54,496	94,152	279,725	135,200	144,524
Direct & Indirect Cost Total	567,999	236,150	407,991	1,212,140	740,524	471,615
Contingency(20%)	113,600	47,230	81,598	242,428	148,105	94,323
Project Cost(1989 Price)	681,598	283,380	489,589	1,454,567	888,629	565,938
Price Escalation	88,804	127,901	416,435	633,140	247,955	385,185
Project Cost Total	770,402	411,281	906,024	2,087,707	1,136,584	951,123

Table G-10 Development Cost of SIRDP

Cost Unit: Rs.'000

Description	Unit	1990-1995		1995-2000		2000-2005		Total	
		Q'ty	Cost	Q'ty	Cost	Q'ty	Cost	Q'ty	Cost
Agricultural Infrastructure Development									
- Irrigation Schemes									
1. Kabalgram Irrig. Scheme(Martung)	ha					320	38,034	320	38,034
2. SSIS	No.	6	17,628	6	17,628	6	17,628	18	52,884
3. Spring Water Tank	No.	15	4,230	15	4,230			30	8,460
4. Sandal Aloch Irrg. & Hydel(Puran)	ha	352	9,790					352	9,790
5. Choga Irrig. & Hydel(Puran)	ha			170	3,670			170	3,670
6. Chakesar Irrig. & Hydel(Chakesar)	ha			110	4,325			110	4,325
Sub-total			31,648		29,853		55,662		117,163
Agricultural Supporting Service Develop.									
- Research									
1. Soil Servey & Equipment	ha	50,700	1,377					50,700	1,377
- Extension & Seed Multiplication									
1. ATTD Farm(Centre and Branches)	L.S.	-	55,793					-	55,793
2. Agricultural Training Centres	No.	3	2,235					3	2,235
3. Extension Facilities(F.A.)	No.	6	3,336					6	3,336
4. Seed Farm	No.	1	2,145					1	2,145
5. Transportation for Extension Service	L.S.	-	546					-	546
6. Fruits Nersary Station	No.	1	980					1	980
7. F & V Training Office	No.	1	370					1	370
8. Bee Keeping Centre	No.	1	2,276					1	2,276
- Liveslock & Poultory									
1. Veterinary Hospital	No.	4	5,592					4	5,592
2. Natural Breeding Centre	No.	3	1,440					3	1,440
3. Artificial Insemination Sub-centre	No.	1	766					1	766
4. Animal Nutrition Improv. Centre	No.	1	706					1	706
5. Poultry Hatchery	No.	1	3,827					1	3,827
6. Animal Distribution	L.S.	-	2,200	-	2,200	-	2,200	-	6,600
- Agricultural Eng. & Soil Conservation									
1. Soil Conservation Project	L.S.	-	10,706					-	10,706
2. Tractor Station	No.	3	13,500					3	13,500
- Cooperatives & Input Supply									
1. Inspector Office	No.	1	785					1	785
2. Cooperative Bank	No.	1	816					1	816
3. Agr. Inputs Warehouse	No.	1	700					1	700
- Small Industry									
1. Women Handicraft Centre	No.	1	1,815					1	1,815
- Marketing Facilities									
1. Main Marketing Centre(Mingora)	No.	1	4,980					1	4,980
2. Marketing Sub-centre	No.	3	3,780					3	3,780
Sub-total			120,671		2,200		2,200		125,071
Road & Communication Development									
1. Road Improvement	km	103.5	107,537					103.5	107,537
2. Road Construction	km	60.0	31,380	57.0	29,811	59.0	30,857	176.0	92,048
3. Wireless Telephone System	L.S.	-	29,000					-	29,000
Sub-total			167,917		29,811		30,857		228,585
Rural Electrification Development									
1. Extension of WAPDA T/M Line	Houses			6,500	31,850	20,200	98,980	26,700	130,830
2. Micro Hydel Power Station	No.	1	25,250					1	25,250
Sub-total			25,250		31,850		98,980		156,080
Village Water Supply Development									
1. Village Water Supply System	Houses	8,600	35,260	6,800	27,880	6,900	28,290	22,300	91,430
Sub-total			35,260		27,880		28,290		91,430
Rural Infrastructure Development									
1. Education Facilities	L.S.	-	35,240	-	38,780	-	61,120	-	135,140
2. Health Facilities	L.S.	-	8,260	-	6,540	-	10,220	-	25,020
3. Sanitation Facilities	L.S.	-	8,452	-	9,660	-	21,410	-	39,502
Sub-total			51,952		54,980		92,750		199,662
Village Community Development									
1. Minor Works Programme	L.S.	-	4,224	-	5,100	-	5,100	-	14,424
Sub-total			4,224		5,100		5,100		14,424
Total			436,922		181,654		313,839		932,415

2.3.2 O & M Cost of SIRDP

Table G-11 Summary of O & M Cost of SIRDP

Cost Unit: Rs.'000

Description	90-95	95-00	00-05	Total
Agricultural Infrastructure Development				
1. New Irrigation Schemes	1,424	3,732	7,144	12,300
Sub-total	1,424	3,732	7,144	12,300
Agricultural Supporting Service Develop.				
1. Research	720	1,200	1,200	3,120
2. Extension & Seed Multiplication	37,997	63,330	63,330	164,657
3. Livestock & Poultry	5,059	8,431	8,431	21,921
4. Agricultural Eng. & Soil Conservation	17,170	28,616	28,616	74,402
5. Cooperatives & Input Supply	1,902	3,171	3,171	8,244
6. Small Industry	777	1,295	1,295	3,367
7. Marketing Facilities	526	876	876	2,278
Sub-total	64,151	106,919	106,919	277,989
Road & Communication Development				
1. Road Improvement/Construction	25,529	51,491	66,711	143,731
2. Wireless Telephone System	0	6,375	6,375	12,750
Sub-total	25,529	57,866	73,086	156,481
Rural Electrification Development				
1. Extension of WAPDA T/M Line		1,950	9,310	11,260
2. Micro Hydel Power Stations	1,515	2,525	2,525	6,565
Sub-total	1,515	4,475	11,835	17,825
Village Water Supply Development				
1. Village Water Supply Schemes	2,941	7,228	11,138	21,307
Sub-total	2,941	7,228	11,138	21,307
Rural Infrastructure Development				
1. Education Facilities	12,346	39,362	89,845	141,553
2. Health Facilities	2,144	5,609	10,312	18,065
3. Sanitation Facilities	1,160	1,934	1,934	5,028
Sub-total	15,650	46,905	102,091	164,646
Village Community Development				
1. Minor Works Programme	0	0	0	0
Sub-total	0	0	0	0
Sub-total	111,210	227,125	312,213	650,548
Contingency(20%)	22,242	45,425	62,443	130,110
O & M Cost(1989 Price)	133,452	272,550	374,656	780,658
O & M Cost per annum(1989 Price)	44,484	54,510	74,931	60,051
Price Escalation	24,964	183,348	508,426	716,737
Project Cost Total	158,416	455,898	883,081	1,497,395
O & M Cost per annum	52,805 (3 years)	91,180 (5 years)	176,616 (5 years)	115,184 (13 years)

Table G-12 O & M Cost of SIRDP

Cost Unit: Rs.'000

Description	Unit	1990-1995		1995-2000		2000-2005		Total	
		Q'ty	Cost	Q'ty	Cost	Q'ty	Cost	Q'ty	Cost
Agricultural Infrastructure Development									
- Irrigation Schemes									
1. Kabalgram Irrig. Scheme(Markung)	ha					320	1,712	320	1,712
2. SSIS	No.	6	794	12	2,117	18	3,440	18	6,350
3. Spring Water Tank	No.	15	189	30	504	30	630	30	1,323
4. Sandal Aloch Irrg. & Hydel(Puran)	ha	352	441	352	735	352	735	352	1,910
5. Choga Irrig. & Hydel(Puran)	ha			170	165	170	276	170	441
6. Chakesar Irrig. & Hydel(Chakesar)	ha			110	212	110	353	110	565
Sub-total			1,424		3,732		7,144		12,300
Agricultural Supporting Service Develop.									
- Research									
1. Soil Servey & Equipment	L.S.	-	720	-	1,200	-	1,200	-	3,120
- Extension & Seed Multiplication									
1. ATTD Farm(Centre and Branches)	L.S.	-	30,612	-	51,020	-	51,020	-	132,652
2. Agricultural Training Centres	No.	3	1,160	3	1,934	3	1,934	3	5,027
3. Extension Facilities(F.A.)	No.	6	1,625	6	2,709	6	2,709	6	7,043
4. Seed Farm	No.	1	1,731	1	2,885	1	2,885	1	7,500
5. Transportation for Extension Service	L.S.	-	328	-	546	-	546	-	1,420
6. Fruits Nersary Station	No.	1	779	1	1,298	1	1,298	1	3,375
7. F & V Training Office	No.	1	292	1	487	1	487	1	1,266
8. Bee Keeping Centre	No.	1	1,470	1	2,451	1	2,451	1	6,371
- Livestock & Poultory									
1. Veterinary Hospital	No.	4	3,374	4	5,622	4	5,624	4	14,620
2. Natural Breeding Centre	No.	3	351	3	585	3	585	3	1,521
3. Artificial Insemination Sub-centre	No.	1	212	1	353	1	353	1	917
4. Animal Nutrition Improv. Centre	No.	1	568	1	947	1	947	1	2,461
5. Poultry Hatchery	No.	1	554	1	924	1	924	1	2,402
6. Animal Distribution	L.S.	-	0	-	0	-	0	-	0
- Agricultural Eng. & Soil Conservation									
1. Soil Conservation Project	L.S.	-	8,260	-	13,766	-	13,766	-	35,792
2. Tractor Station	No.	3	8,910	3	14,850	3	14,850	3	38,610
- Cooperatives & Input Supply									
1. Inspector Office	No.	1	803	1	1,339	1	1,339	1	3,480
2. Cooperative Bank	No.	1	859	1	1,432	1	1,432	1	3,722
3. Agr. Inputs Warehouse	No.	1	240	1	400	1	400	1	1,040
- Small Industry									
1. Women Handicraft Centre	No.	1	777	1	1,295	1	1,295	1	3,366
- Marketing Facilities									
1. Main Marketing Centre(Mingora)	No.	1	299	1	498	1	498	1	1,295
2. Marketing Sub-centre	No.	3	227	3	378	3	378	3	983
Sub-total			64,150		106,915		106,917		277,982
Road & Communication Development									
1. Road Improvement	km	103.5	16,115	103.5	26,858	103.5	26,858	103.5	69,831
2. Road Construction	km	60.0	9,414	112.0	24,633	176.0	39,853	176.0	73,900
3. Wireless Telephone System	L.S.	-	0	-	6,375	-	6,375	-	12,750
Sub-total			25,529		57,867		73,086		156,481
Rural Electrification Development									
1. Extension of WAPDA T/M Line	Houses	0	0	6,500	1,950	26,700	9,310	26,700	11,260
2. Micro Hydel Power Station	No.	1	1,515	1	2,525	1	2,525	1	6,565
Sub-total			1,515		4,475		11,835		17,825
Village Water Supply Development									
1. Village Water Supply System	Houses	8,600	2,941	15,400	7,228	22,300	11,138	22,300	21,307
Sub-total			2,941		7,228		11,138		21,307
Rural Infrastructure Development									
1. Education Facilities	L.S.	-	12,346	-	39,362	-	86,845	-	141,554
2. Health Facilities	L.S.	-	2,144	-	5,609	-	10,312	-	18,065
3. Sanitation Facilities	L.S.	-	1,160	-	1,934	-	1,934	-	5,028
Sub-total			15,651		46,905		102,091		164,646
Village Community Development									
1. Minor Works Programme	L.S.	-	0	-	0	-	0	-	0
Sub-total			0		0		0		0
Total			111,209		227,122		312,211		650,542

ANNEX H. PROJECT ECONOMY

LIST OF TABLE

(Economic Justification of Irrigation Scheme, SIRDP) Page

(Economic Justification of Road Schem,SIRDP)

(Economic Justification of Hydel Power, SIRDP)

(Economic Justification of Village Water Supply, SIRDP)

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TABLE H-1 PERCENTAGE CHANGES IN PRICE INDICES [1/]

(Unit: %)

Year	GDP Deflator	CPI	SPI	WPI
Average for the period 1972-73 to 1979-80	13.6	14.1	9.4	14.7
1981-82	9.1	11.1	15.4	7.4
1982-83	6.0	4.7	3.0	5.4
1983-84	9.6	7.3	7.4	10.0
1984-85	5.8	5.7	8.7	5.2
1985-86	5.2	4.4	3.1	4.6
1986-87	5.4	3.6	2.4	5.0
1987-88	7.1	5.8 [2/]	7.2 [2/]	10.3 [2/]

Notes : 1/ CPI denotes Consumer Price Index (464 items)
WPI denotes Wholesale Price Index (690 items)
SPI denotes Sensitive Price Indicator (46 items)

2/ These figures are annalized changes based on July - March Averages

3/ 1976-77 to 1979-80

Source: Economic Survey 1987-88, Finance Division, Economic Advisor's Wing, Islamabad

TABLE H-2 CHANGE IN CPI BY GROUP

(Unit: %)

Group	1986-87 July-March	1987-88 July-March
General Index	3.3	5.8
Food, Beverages Tobacco	3.3	7.4
Apparal, Textile & Footwear	3.0	7.1
House Rent	3.4	3.1
Fuel & Lighting	- 1.5	4.3
Household, Furniture & Equipment	0.5	5.1
Transport & Communication	6.1	3.6
Recrreation & Education	5.6	7.7
Cleaning & Laundry	2.8	4.3
Miscellaneous	4.6	3.6

Source: Economic Survey 1987-88, Finance Division
Economic Advisor's Wing, Islamabad

TABLE H-3 CHANGE IN WPI BY GROUP

(Unit: %)

Group	1986-87 July-March	1987-88 July-March
General Index	4.2	10.3
Food	4.4	9.0
Row Materials	8.0	22.0
Fuel, Lighting & Lubricants	- 0.9	10.3
Manufactures	5.9	8.2
Building Materials	2.9	10.6

Source: Economic Survey 1987-88, Finance Division
Economic Advisor's Wing, Islamabad

TABLE H-4 MARKET (WHOLE SALE) PRICES OF MAJOR FOOD-STUFF IN MINGORA (1987-1988)

(Unit: RS/kg.)

Items	Year :	1987			1988									Year
	Month:	10	11	12	1	2	3	4	5	6	7	8	9	Average
Red Gram		13.0	13.0	13.0	13.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.7
Wheat Flour		3.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Fine Rice		9.0	9.0	9.0	9.0	10.0	10.0	9.0	10.0	10.0	10.0	10.0	10.0	9.6
{ Basmati		8.0	8.0	8.0	8.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.3
{ Irri.		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Beef		14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Mutton		25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Corn Oil		48.0	48.0	48.0	48.0	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	51.0
Brown Sugar		7.5	8.25	8.25	5.75	6.75	6.25	6.5	6.25	6.25	6.25	6.0	6.0	6.7
Wheat		2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.2	2.3	2.3	2.3	2.3
Maize		2.2	2.25	2.1	2.1	2.6	3.2	3.2	3.2	3.2	3.2	3.2	2.7	2.7
Tomato		6.5	6.25	5.5	3.0	4.5	6.0	8.5	4.5	3.5	3.5	9.5	6.5	5.6
Cabbage		4.5	4.5	3.5	3.5	3.5	3.5	4.5	4.5	-	-	8.5	7.0	4.75
Yam		4.5	5.0	5.75	6.5	6.5	6.5	8.0	10.0	-	-	6.5	6.0	6.5
Potato		4.25	4.0	4.0	4.5	4.5	3.5	4.0	4.5	5.0	5.0	4.5	4.5	4.4
Onion		5.0	4.0	4.5	3.5	3.5	3.0	3.0	3.5	3.5	3.5	3.5	3.5	3.7
Turnip		3.0	2.5	1.75	1.75	1.75	1.75	3.25	2.5	2.5	2.25	3.0	3.0	2.4
Veg. Leaf		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	3.0	1.0	1.2
Apple		13.0	11.0	11.0	12.0	13.0	12.0	13.0	20.5	20.5	-	-	12.5	13.85

Source: Agricultural Dept. Food Controller Office Saidu Sharif.

TABLE H-5 MARKET (WHOLE SALE) PRICES OF MAJOR FOOD-STUFF IN MINGORA (1988-1989)

(Unit: RS/kg.)

Items	Year :	1988			1989						Average
	Month:	10	11	12	1	2	3	4	5	6	(9 month)
Red Gram		11.0	11.0	11.0	11.0	11.0	11.0	12.0	12.0	12.0	11.3
Wheat Flour		3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	3.7
Fine Rice		10.0	10.0	10.0	10.0	10.0	10.0	12.0	12.0	12.0	10.7
{ Basmati		8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.3
{ Irri.		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Beaf		14.0	14.0	14.0	16.0	16.0	16.0	18.0	19.0	19.0	16.2
Mutton		25.0	25.0	25.0	28.0	28.0	28.0	32.5	32.5	32.5	28.5
Corn Oil		52.5	52.5	52.5	52.0	52.0	62.5	62.5	62.5	62.5	56.8
Brown Sugar		6.2	5.7	6.0	5.5	6.3	6.0	6.5	6.3	6.3	6.1
Wheat		2.2	2.3	2.4	2.5	2.5	2.8	2.9	2.4	2.4	2.0
Maize		2.3	2.3	2.7	2.8	2.9	3.0	3.0	3.3	3.1	2.8
Tomato		6.0	6.5	4.0	6.5	4.5	4.0	8.5	2.8	2.5	5.0
Cabbage		-	4.5	4.5	3.5	3.5	4.0	5.5	-	-	4.3
Yam		5.5	5.0	4.5	4.5	4.5	5.0	5.5	4.5	-	4.9
Potato		6.0	7.0	4.5	3.5	3.5	3.5	3.5	2.8	2.8	4.1
Onion		5.5	6.0	4.5	5.5	3.5	4.5	4.5	2.8	2.5	4.4
Turnip		4.0	2.0	2.0	2.0	2.5	1.7	2.5	2.0	2.0	2.3
Veg. Leaf		1.0	1.0	2.0	2.0	2.0	1.0	3.5	2.0	2.0	1.8
Apple		13.0	13.0	13.0	13.0	13.0	13.0	22.5	22.5	25.0	16.4

Source: Agricultural Dept. Food Controller Office Saidu Sharif.

TABLE H-6 SEEDS RETAIL PRICES IN MINGORA

- July 1989 -

Crops	Unit (kg)	Price (RS)	Country of Origin
Cerals			
Maize	90	305	Pakistan
Wheat	90	303	Pakistan
Vegetables	(g)	(RS)	
Onion	1,250	160 ~ 250	Pakistan
Tomato	200	100	Italy
"	200	110	Denmark
"	200	120	France
"	200	130	Netherland
Turnip	400	40	U.S.A.
Radish	1,000	25	Pakistan
Green Pepper	200	100	Netherland
Spinach	1,000	15	Pakistan
Cucumber	200	55	Netherland
"	1,000	60	Pakistan
Pumpkin	1,000	50	"
Eggplant	50	10	"
Chili	500	30	"
Pease	1,000	20	"

Source: Mingora Seed Retailer

TABLE H-7 FERTILIZER RETAIL PRICES IN MINGORA

(Unit: 50 kg/RS.)

Items	Year			
	1986	1987	1988	1989
Ammonia Sulphate	-	-	-	65
Urea	124	132	132	132
Super Phosphate 16	-	39	39	45
" 18	-	46	46	49
Mixture 10-20-20	98	105	105	115
" 13-13-21	93	98	98	105
DAP	146	161	161	185
Nitro-Pass	110	110	119	137.50
Potassium	50	60	60	72

TABLE H-8 FERTILIZER TRANSPORTATION CHARGE

(Unit: RS per bag (50kg))

Location	Charge in 1989
Mingora to Shangla Par	4 - 6
Mingora to Kalam	5 - 6
Mingora to Madyan	3 - 4
Mingora to Lower Swat	1 - 2
Mingora to Buner	1 - 2

Source: Mingora Fertilizer Dealer

TABLE H-9 RENTAL FEE OF TRACTOR AND WAGE

Sub-District	RS/Tractor
Swat	70 /hour
Shangla Par	80~85/hour
Bunner	70 /hour
Wage	35~40/Man/day

TABLE H-10 USAGE RATIO OF THE CULTIVATION

Sub-District	Ploughing percentage (%) Animal Driven: Machinery (Tractor)
Swat	5 : 95
Shangla Par	65 : 35
Buner	10 : 90

Source: Agriculture Office Swat

TABLE H-11 WHEAT TRANSPORTATION COST

Section	RS/ton
Karachi ----- Mingora	547.687
Railway	
Karachi ---- Dargai (Mardan District)	472.062
Road	
Dargai ---- Mingora	75.625

Source: Agricultural Dept. Food Controller Office Saidu Sharif.

TABLE H-12 YEARLY CONSUMPTION PER CAPITA OF MAJOR FOOD

(Unit: kg/year/head)

Items	All Pakistan	N.W.F.P.	
		Urban	Rural
Wheat, Wheat Flour	128.88	103.08	144.0
Rice, Rice Flour	15.0	5.88	10.3
Pulses	6.84	6.24	7.2
Milk	76.2	62.64	55.56
Ghee and Oil	9.24	9.72	9.6
Meat	6.72	14.16	7.32
Fish	7.2	0.24	1.2
Chickens	6.0	0.72	1.44
Eggs	19.44	22.2	21.84
Fruit	53.28	69.0	27.6
Vegetable	36.6	44.52	36.12
Gur and Shakar	3.96	5.88	13.68
Tea	0.72	1.32	1.32

Source: Household Income and Expenditure Survey 1984/85.

TABLE H-13 IMPORTED WHEAT OF SWAT DISTRICT (1987/1988)

(Unit: ton)

Items	Year :	1987		1988										Total
	Month:	11	12	1	2	3	4	5	6	7	8	9	10	
Grain		4,141	7,066	7,563	5,678	3,357	1,786	1,655	3,627	5,164	6,712	8,612	8,934	64,295
Flour		1,717	1,774	1,791	1,876	1,961	1,670	1,491	1,527	1,586	1,622	1,646	1,705	20,366
Government Imported		5,858	8,840	9,354	7,554	5,318	3,456	3,146	5;154	6,750	8,334	10,258	10,639	84,661
Private Imported		102	114	78	114	162	113	126	102	90	114	102	138	1,355
Total		5,960	8,954	9,432	7,668	5,480	3,569	3,272	5,256	6,840	8,448	10,360	10,777	86,016
Supply for Afghanistan Refugee		215	215	215	215	215	215	215	215	215	215	215	215	2,580

Source: Agricultural Dept. Food Controller Office, Saidu Sharif.

TABLE H-14 POPULATION OF MOTOR VEHICLES (REGISTERED) OF DIFFERENT CLASSES GOVERNMENT AND PRIVATE OWNED IN N.W.F.P. AS ON 31ST DECEMBER

Year	N.W.F.P. Total Population	Growth Rate (%)	Swat Total Population	Growth Rate (%)
1970	30,309			
1971	32,454	7.1		
1972	35,161	8.3		
1973	37,602	6.9		
1974	42,415	12.8		
1975	47,695	12.4		
1976	54,444	14.2		
1977	63,067	15.8		
1978	72,644	15.2		
1979	84,248	16.0	4,533	
1980	94,396	12.0	5,348	18.0
1981	105,601	11.9	6,068	13.5
1982	118,321	12.0	6,707	10.5
1983	131,168	10.9	7,556	12.7
1984	143,757	9.6	8,678	14.8
1985	132,312	Δ 8.0	9,999	15.2

Source: Director Excise and Taxation, Government of N.W.F.P. Peshawar. Development Statistics, N.W.F.P. 1986.

TABLE H-15 NUMBER OF MOTOR VEHICLES OF DIFFERENT CLASSES (ON ROAD) GOVERNMENT AND PRIVATE OWNED IN N.W.F.P. AS ON 31ST DECEMBER

Year	N.W.F.P. Total Number	Growth Rate (%)		Swat Total Number	Growth Rate (%)	
1970	14,674					
1971	17,812	21.4				
1972	19,122	7.4				
1973	21,798	14.0				
1974	25,240	15.8				
1975	26,897	6.6				
1976	33,455	24.4				
1977	39,377	17.7				
1978	49,249	25.1				
1979	57,007	15.8		4,365		
1980	62,744	10.1		5,190	18.9	
1981	70,445	12.3		5,946	14.6	
1982	79,510	12.9	12.5	6,617	11.3	14.0
1983	86,516	8.8		7,371	11.4	
1984	95,956	10.9		8,494	15.2	
1985	113,084	17.8		9,999	17.7	

TABLE H-16 FARM PRODUCTION SURVEY OF 30 SAMPLE FARM IN SHANGLA PAR (1)
- LAND USE AND FARM PRODUCTION -

30 Farm		Total Number	Average Number
Family number		480	16
Number of farm worker		90	3
Land Use			
Rainfed	(acre)	202.4	6.75
Irrigated		81.9	2.73
Upland		205.9	6.86
Pasture		572.3	19.1
Total Acreage		1,062.4	35.4
Karif Production			
1) Rice			
Planted area	(acre)	74.75	2.49
Total production (Maund)		1,126.0	37.53
Average yield (Maund)		291.9	9.73
RS/kg.		-	3.3
Total RS		216,079.0	7,202.6
2) Maize			
Planted area	(acre)	218.6	7.29
Total production(Maund)		1,815.0	60.5
Average yield (Maund)		376.6	12.55
RS/kg.		-	2.0
Total RS		141,241.0	4,708.0
Rabi Production			
1) Wheat			
Planted area	(acre)	229.6	7.65
Total production (Maund)		1,650.0	55.0
Average yield (Maund)		323.3	10.78
RS/kg.		-	2.61
Total RS		163,397.0	5,446.6

- LIVESTOCK RAISING -

Name of Animals		Total Number	Average Number
Cattle	(head)	64	2.1
Cattle calf		16	0.53
Buffalo	(head)	67	2.23
Buffalo		22	0.73
Seep		3	0.1
Goat		13	0.43

Source: JICA Study Team.

TABLE H-17 FARM PRODUCTION SURVEY OF 30 SAMPLE FARM IN SHANGLA PAR (2)
- CROPS PRODUCTION COST PER FARM HOUSEHOLD -

Production Cost		Rice		Maize		Wheat	
		30 Farm Total	30 Farm Average	30 Farm Total	30 Farm Average	30 Farm Total	30 Farm Average
Seeds							
Quantity	(Maund)	38.7	2.04	87.8	3.03	87.86	3.03
Unit cost	(RS)	4,550.0	239.5	3,270.0	112.7	3,655.0	126.03
Value	(RS)	9,590.0	504.7	9,365.0	322.9	11,279.0	388.9
DAP							
Quantity	(Bag)	26.0	2.0	48.0	1.92	47.0	2.14
Unit cost	(RS)	2,755.0	211.9	5,130.0	205.2	4,360.0	198.2
Value	(RS)	5,525.0	425.0	9,815.0	392.6	9,230.0	419.5
Urea							
Quantity	(Bag)	43.0	2.53	81.0	2.89	572.0	19.7
Unit cost	(RS)	2,480.0	145.9	4,185.0	149.5	4,325.0	149.0
Value	(RS)	6,400.0	376.5	11,770.0	420.4	11,450.0	394.8
Sulphate							
Quantity	(Bag)	44.0	4.0	35.0	2.7	38.0	2.7
Unit cost	(RS)	886.0	80.5	1,128.0	86.8	1,218.0	87.0
Value	(RS)	3,792.0	344.7	3,051.0	234.7	3,071.0	219.4
Pestiside	(Bag)	0	0	0	0	0	0
Hired labor		0	0	0	0	0	0
Total		36,130	2,339.3	47,966.0	1,935.3	49,333.0	2,010.5

Source: JICA Study Team.

TABLE H-18 FARM PRODUCTION SURVEY OF 30 SAMPLE FARM IN SHANGLA PAR (3)
- DISPOSAL OF THE PRODUCTION -

Items	Total Number	Average Number
Rice		
Total production (Maund)	1,126.0	37.53
Rent (Share)	261.3	8.71
Home consumption	614.7	20.5
Seeds	38.52	1.28
Stored	47.0	1.57
Given away	112.53	3.75
Sold out	65.0	2.17
Maize		
Total production (Maund)	1,873.0	62.43
Rent (Share)	419.25	13.98
Home consumption	1,099.15	36.64
Seeds	98.6	3.29
Stored	-	-
Given away	188.0	6.27
Sold out	-	-
Wheat		
Total production (Maund)	1,645.0	54.3
Rent (Share)	390.58	13.02
Home consumption	-	-
Seeds	932.45	31.1
Stored	86.16	2.87
Given away	35.5	1.18
Sold out	166.9	5.56

Source: JICA Study Team

TABLE H-19 DRINKING WATER FETCH SURVEY, JULY 1989

- Chakesar, Puran & Martung -

Item	Chakesar Sub-Tehsil	Puran Sub-Tehsil	Martung Sub-Tehsil	Total
1. Sample Farm	10	10	10	30
2. Water Source				
a. Own well	-	2	-	2
b. Community well	-	-	-	-
c. Pipe supply	1	1	-	2
d. River/Stream	-	1	-	1
e. Spring	9	6	10	25
3. Distance House to Water Source				
a. 0 yard	1	2	3	5
b. Less than 10 yard	-	2	3	5
c. 11 to 100 yard	1	2	-	3
d. 101 to 500 yard	4	3	2	9
e. 501 to 1,000 yard	1	1	-	2
f. 1,001 to 2,000 yard	2	1	-	3
g. 2,001 to 3,000 yard	-	-	1	1
h. 3,001 to 4,000 yard	1	-	1	2
4. Daily Water Fetch Work per Household				
a. Average hours per one trip (both way)	0.78 hr (8 sample)	0.43 hr (7 sample)	0.42 hr (7 sample)	0.51 hr (22 sample)
b. Average times per day	6.1 times	3.7 times	3.3 times	4.5 times
c. Average engaged family member per one trip	3.4 persons	3.3 persons	2.9 persons	3.2 persons
d. Total daily work	16.2 hr	5.2 hr	4.0 hr	7.3 hr

TABLE H-20 TREND OF POPULATION IN SHANGLA-PAR SUB-DIVISION

Sub-Tehsil	Union Council	1981	1988	Annual Growth %
Alupri	Ban Ghurband		25,000	
	Kur Ghurband		26,400	
	Kuz Kana		11,798	
	Bar Kana		11,923	
	Pir Kana		16,438	
	Lilonai		17,880	
	Shahpur		12,056	
	Total	102,742	121,495	2.5
Puran	Makhozai		21,662	
	Puran		29,524	
	Total	45,432	51,186	1.8
Martung	Martung		18,228	
	Behlol Khel		17,714	
	Total	33,544	35,942	1.0
Chakesar	Chakesar Kuz Paw		22,410	
	Chakesar Bar Paw		29,056	
	Total	38,806	51,466	4.1
Bisham	Dandai		19,800	
	Bisham		27,050	
	Total	31,022	46,850	6.2
	Grand Total	251,546	306,939	2.8

TABLE H-21 SOCIO-ECONOMIC SITUATION BY WARD, SIRDP

U.C.	Ward	Land Revenue Village	Population 1988	House 1988	Cultivated Land (ha) Irrig.	Un-irri.	Total	Health BHU	RHU	School Pri	Mid	High	Shop
(Chakesar)													
Chakesar	Gagai Hujra	Bunerwali	2,236	344	4	403	407			2			10
Bar Pow	Kamra Hujra	Chakesar	3,271	505	51	319	370			1			30
	Kadang	Kadang	2,849	438	7	587	594			2			10
	Dang Kol	Dang Kol	3,648	563	15	580	595			2			15
	Opal	Opal Punial	3,585	550	10	514	524	1		3			10
	Mugan H. Abad	Kandt, Chedam	2,739	420	11	648	659			4			10
	Katkor	Katkor	2,877	443	35	323	358			1			10
	Gps Shawawo	Langbar	3,829	590	22	567	589			2			13
	Karora	Karora, Gulibat	4,022	617	18	640	658		Hospi-tal	2			30
	(Sub-total)		(29,056)	(4,470)									
Chakesar	Fatoh Hujra	Chakesar	1,862	286	22	143	165			1			60
Kuz Pow	Kuza Hujra	Chakesar	2,419	372	37	217	254				1		20
	Sondia	Dandy	4,191	645	8	309	317			1			10
	Jetkol	Jetkol	2,754	424	74	199	273			1			8
	Canagar	Counagar	3,058	469	40	89	129			1			20
	Taloon	Taloon	2,859	441	15	590	605			2			4
	Sarkool	Sarkool	3,343	514	39	162	201			3			10
	Kaparai	Daoot	1,924	297	1	136	137	1		1			5
	(Sub-total)		(22,410)	(3,448)									
(Chakesar)	(Total)		(51,466)	(7,918)	(409)	(6,426)	(6,835)						
(Puran)													
Hakhozai	Aman Dehrai	Doraseral	2,173	280	23	83	106			1			10
	Chawga	Chowga	2,663	345	171	620	791	1		3			25
	Bina	Bina	2,000	258	17	165	182			2			20
	Shakawali	Shakewlee	2,700	351	92	753	845			1	2	1	20
	Pandoria	Pandoria	2,109	272	56	192	248			3			25
	Sangrai	Harikgee, Sangrai	2,500	322	60	459	519			3			12
	Baryan	Gharrea, Enawar	2,064	266	53	492	545			2			10
	Kuz Paw	Koze Pow	2,510	325	33	318	351			2	1		20
	Machaudai	Machkundai, Shinkaprea	2,943	385	11	362	373			3			9
	(Sub-total)		(21,662)	(2,804)	(493)	(3,161)	(3,854)						
Puran	Dehrai	Sanila	2,766	256	57	390	447			3			10
	Towa	Sandai	1,699	158	66	472	538			2			25
	Sanela	Sanila	2,670	245	49	332	381			3			15
	Chagam	Chagan	2,122	196	221	447	668			2			10
	Sandoral	Kaloi	1,795	166	23	58	61			1	1		25
	Falga	Sandai	2,543	234	47	342	389			3			20
	Bangalai	Bengalai	3,420	316	81	520	601			2		1	15
	Alloch	Alloch	3,162	292	53	217	270		Hospi-tal	2			50
	Nemkalai	Nim Kalai	3,523	322	40	329	369			2			50
	Kaddona	Kadona	3,086	286	18	383	401			3			20
	Kotkai	Kotkai	2,738	254	39	273	312			3			15
	(Sub-total)		(29,524)	(2,725)	(493)	(3,361)	(3,854)						
(Puran)	(Total)		(51,186)	(5,529)	(1,210)	(7,207)	(8,417)						
(Hartung)													
Hartung	Manz Killai	Manz Kalay, Kot Ki Hartung	2,209	403	34	366	400			1			5
	Shaga	Shaga, Ashara Sar	2,465	450	6	96	102			2			4
	Mandorya	Mandorla, Mirjalay, Seral	2,014	370	21	197	218			2			10
	Kuzkali	Koz-Kalay	1,016	187	31	202	233			1			85
	Bar Kabargram	Bar Kabargram	2,539	463	23	425	448	1			1		30
	Kuz Shalmani	Alamar Banda	1,900	347	10	148	158			5			15
	Behar	Behar, Hasham Khel	2,373	433	51	220	271			1			12
	Kamach	Kamach	3,712	680	21	615	636			2	1		35
	(Sub-total)		(18,228)	(3,333)	(206)	(2,573)	(2,779)						
Bahlol	Pashlor	Rich Kand, Pishlore	2,211	568	25	236	261			4	1	1	13
Khel	Tetwalon	Thitwalan, Thirauepal	2,649	681	22	763	785	1		3	1		20
	Dankol	Dankol	2,000	513	9	107	116			1			23
	Charaq	Charaq Baba, Toranikhel	2,009	513	10	153	163			1			6
	Sandapalai		2,070	531	5	305	310			1			1
	Atteshat Kotai	Mosakhelo Sar, Gad Garel	2,000	513	5	299	304			1			2
	Nasak	Nasak	2,023	518	-	73	73			1			2
	Dedal	Dedar	2,761	705	43	490	533			2			4
	(Sub-total)		(17,714)	(4,542)	(114)	(1,621)	(1,735)						
(Hartung)	(Total)		(35,942)	(7,875)	(320)	(4,194)	(4,514)						

TABLE H-22 ESTIMATION OF STANDARD CONVERSION FACTOR (SCF) FOR PAKISTAN

(Unit: '000 R.S.)

Item	FY 82-83	FY 83-84	FY 84-85	FY 85-86	FY 86-87	5 Years Average
(1) Total Import Value (CIF)	68,151	76,707	89,778	90,946	92,431	83,603
(2) Total Import Duties	18,110	21,074	22,882	24,334	26,520	22,584
(3) Total Export Value (FOB)	34,442	37,339	37,978	49,592	63,268	44,524
(4) Total Export Duties	400	458	489	990	252	518
(5) Export Subsidy	1,380	1,694	-	1,834	-	982
(6) = (1) + (3)	102,593	114,046	127,756	140,538	155,699	128,127
(7) (1) + (2) + (3) - (4) + (5)	121,683	136,356	150,149	165,716	181,967	151,175
(8) SCF = (6)/(7)						0.85

Source: Economic Survey, 1987-88, Finance Division, Economic Advisor's Wing, Islamabad

TABLE II-23 FARM GATE PRICE OF AGRICULTURAL INPUTS AND OUTPUTS

Item	Unit	1988		1995		2000	
		Financial	Economic	Financial	Economic	Financial	Economic
1. Crop							
a. Rabi - Wheat	RS/MT	3,700	3,610	3,272	3,182	3,425	3,335
- Rake & Mustard	"	8,040	6,835	8,040	6,835	8,040	6,835
- Red Gram	"	11,500	9,780	11,500	9,780	11,500	9,780
- Onion	"	3,900	3,315	3,900	3,315	3,900	3,315
- Cabbage	"	4,560	4,480	4,560	4,480	4,560	4,480
b. Kharif - Maize	"	2,700	2,295	2,700	2,295	2,700	2,295
- Paddy	"	2,304	2,412	1,709	1,817	1,603	1,711
- Potato	"	4,180	3,550	4,180	3,550	4,180	3,550
- Tomato	"	4,842	4,116	4,842	4,116	4,842	4,116
- Lentil	"	13,400	11,390	13,400	11,390	13,400	11,390
- Apple	"	12,200	10,370	12,200	10,370	12,200	10,370
2. Fertilizers							
- Urea	RS/bag	219	213	276	270	262	256
- DAP	"	284	277	362	355	370	363
- Potasium Chloride	"	162	157	178	172	182	177
3. Crop seeds							
- Wheat	RS/kg	3.7	3.6	3.7	3.6	3.7	3.6
- Rape & Mustard	"	100	85	100	85	100	85
- Onion	"	164	139	164	139	164	139
- Culiflower	"	15	13	15	13	15	13
- Maize	"	3.4	2.9	3.4	2.9	3.4	2.9
- Tomato	"	575	489	575	489	575	489
4. Labor							
- Family	RS/manday	30	23	30	23	30	23
- Hired	"	35	26	35	26	35	26
5. Draft Animal	RS/pair day	80	60	80	60	80	60
6. Tractor							
- Rental							
Swat	RS/hour,acre	70	60	70	60	70	60
Shangla Par	"	80	70	80	70	80	70
Buner	"	70	60	70	60	70	60

Notes :
1. Prices for Wheat, paddy, urea, DAP and Potasium Chloride are estimated in the price structure study.
2. Financial prices for red gram, onion, cabbage, maize, potato, tomato are average prices (wholesale price - transportation cost from farm gate to market of 80 RS/MT) from Oct. 1987 to June 1989. These data is obtained from Food Controller, FALCD, Swat.
Economic price is estimated using SCF 0.85.
Apple price is based on production cost data of FALCD.
3. Crop seeds prices are based on information obtained from Food Controller, FALCD, Swat.
4. Economic price of labor and draft animal are estimated using conversion factor of 0.75.
5. Tractor rental charges are based on Food Controller, FALCD, Swat.

TABLE H-24 PRICE STRUCTURE OF PADDY

Item		Unit	1988		1995		2000	
			Financial	Economic	Financial	Economic	Financial	Economic
1. Rice, 5% broken, FOB, Bangkok 1985 Constant	1/	US$/MT	215	215	173	173	166	166
2. Convert to 1988 Constant price	2/	US$/MT	240	240	193	193	185	185
3. FOB, Karachi	3/	US$/MT	230	230	185	185	177	177
4. Convert to Rupee	4/	RS/MT	4,830	4,830	3,885	3,885	3,717	3,717
5. Port charges, handling, storage, administration	5/	RS/MT	- 770	- 655	- 770	- 655	- 770	- 655
6. Railway cost between Karachi and Dargai	6/	RS/MT	- 470	- 400	- 470	- 400	- 470	- 400
7. Truck cost Dargai to Mingora	7/	RS/MT	- 75	- 65	- 75	- 65	- 75	- 65
8. Ex-millgate price Paddy Equivalent	8/	RS/MT	2,214	2,337	1,619	1,742	1,513	1,636
9. Transportation cost Farm to Mingora and milling cost	9/	RS/MT	90	75	90	75	90	75
10. Farm gate price								
Paddy	10/		2,304	2,412	1,709	1,817	1,603	1,711
Rice Equivalent			3,657	3,827	2,713	2,884	2,544	2,716

(Paddy Price)

Notes : 1/ Commodity Price Forecasts in Office Memorandum, Oct. 1988, World Bank.

2/ According to the Office Memorandum, weighted index of commodities price (1979-1981 = 100) is as follows.
Cereals: 1985 year 72.6, 1986 year 63.4, 1987 year 59.9, 1988 year 81.1
Price index in 1988 is estimated at 1.117 (81.1 ÷ 72.6).

3/ Constant price in 1988 is evaluated at 240 US$/MT.
Rice price, FOB, Karachi in 1987/88 is averaged at 230 US$/MT.
This FOB, Karachi is used in the price structure study.

- Pakistan Rice Export -

Item		Unit	1986/87	1987/88
Basmati	Value	1,000 RS	2,828,312	2,285,771
	Quantity	M/T	221,825	187,654
	Unit price	RS/kg	12.75	12.18
Others	Value	1,000 RS	3,576,061	2,853,409
	Quantity	M/T	988,374	1,082,744
	Unit price	RS/kg	3.62	2.63
Total	Value	1,000 RS	6,404,373	5,139,180
	Quantity	M/T	1,210,199	1,270,398
	Unit price	RS/kg	5.292	4.045
		RS/MT	5,292	4,045
		US$/MT	300	230
		(17.6RS/$)		

Source:
Foreign Trade Statistics of Pakistan, Exports & Re-Exports, April-June, 1988.

Forcasting prices are estimated as follows.

1995: $230 \times \frac{193}{240} = 185$ $/MT 2000: $230 \times \frac{185}{240} = 177$ $/MT

4/ Official exchange rate is 21 RS/US$.

5/ 770 RS is based on Foodgrain Transport Economics and Logistic Study by National Transport Research Center Planning Commission, 1986. This figure is directly quoted from Chitral Area Development Project Report, Annex, Table 15, 39 page.
Economic value is estimated using standard conversion factor of 0.85.

6/ Food Controller, Food, Agriculture, Livestoc and Cooperative Department, Swat.

7/ Ibid.

8/ Milling ratio is 63%.

9/ Transportation cost of paddy is averaged at 40 RS/MT based on the information from Food controller, FALCD, Swat. Milling costs is 50 RS/MT.

10/ Market price (consumption) of rice in Mingora is as follows.

	- Average RS/kg - Nov.,1987/Sep.,1988	Sep.1988/Jun.1989
Basmati	8.3	8.3
Irri	4.0	4.0

Source: Food Controller, FALCD, Swat.

TABLE H-25 PRICE STRUCTURE OF WHEAT

Item	Unit	1988		1995		2000	
		Financial	Economic	Financial	Economic	Financial	Economic
1. FOB, St. Lawrence, Canada in 1985 constant 1/	US$/MT	125	125	106	106	113	113
2. Convert to 1988 constant price 2/	US$/MT	140	140	118	118	126	126
3. Freight, handling and insurance, Canada-Middle East 3/	US$/MT	26	26	26	26	26	26
4. CIF, Middle East	US$/MT	166	166	144	144	152	152
5. Convert to Rupee 4/	RS/MT	3,486	3,486	3,024	3,024	3,192	3,192
6. CIF, Karachi 5/	RS/MT	3,080	3,080	2,672	2,672	2,820	2,820
7. Port handling charge 6/	RS/MT	155	135	135	115	140	120
8. Karachi Port Price	RS/MT	3,235	3,215	2,807	2,787	2,960	2,940
9. Railway cost between Karachi and Dargai	RS/MT	470	400	470	400	470	400
10. Truck cost Dargai to Mingora	RS/MT	75	65	75	65	75	65
11. Price at Mingora	RS/MT	3,780	3,680	3,352	3,252	3,505	3,405
12. Transportation cost Farm to Mingora	RS/MT	- 80	- 70	- 80	- 70	- 80	- 70
13. Farm gate price	RS/MT	3,700	3,610	3,272	3,182	3,425	3,335

(Wheat Price)

Notes : 1/ Commodity Price Forecasts in Office Memorandum, Oct. 1988, World Bank.

2/ Price index in 1988 is estimated at 1.117 based on the Office Memorandum, World Bank.

3/ Based on Chitral Area Development Project Report, Annex, Table 14, Page 39.

4/ Official exchange rate in 21 RS/US$.

5/ CIF, Karachi in 1987/88 in estimated at 3,080 RS/MT. This figure is used in the price structure study.

- Pakistan Wheat (unmilled) Import -

Item	Unit	1986/87	1987/88
Value	1,000 RS	1,184,043	1,850,525
Quantity	M/T	377,788	600,867
Unit Price	RS/MT	3,134	3,080

Source: *Foreign Trade Statistics of Pakistan*, Imports, April-June, 1988

Forecasting prices are estimated as follows.

1995: $3,080 \times \frac{3,024}{3,486} \approx 2,672$

2000: $3,080 \times \frac{3,192}{3,486} \approx 2,820$

6/ Port handling charge is assumed at 5% of CIF Karachi. Economic value is estimated using standard conversion factor of 0.85.

TABLE H-26 PRICE STRUCTURE OF UREA (N: 46%)

Item		Unit	1988		1995		2000	
			Financial	Economic	Financial	Economic	Financial	Economic
1. FOB, Urea, N.W. Europe in 1985 constant price	1/	US$/MT	105	105	141	141	132	132
2. Convert to 1988 constant price	2/	US$/MT	147	147	198	198	185	185
3. Fright charge and insurance	3/	US$/MT	23	23	24	24	24	24
4. CIF Price, Karachi		US$/MT	170	170	222	222	209	209
5. Convert to Rupees		RS/MT	3,570	3,570	4,662	4,662	4,389	4,389
6. Port handling charge	4/	RS/MT	180	155	235	200	220	190
7. Railway cost between Karachi and Dargai	5/	RS/MT	470	400	470	400	470	400
8. Truck cost Dargai to Mingora	5/	RS/MT	75	65	75	65	75	65
9. Price at Mingora		RS/MT	4,295	4,190	5,442	5,327	5,154	5,044
10. Transport to farmgate	5/	RS/MT	80	70	80	70	80	70
11. Farm gate price		RS/MT	4,375	4,260	5,522	5,397	5,234	5,114
		RS/bag (50kg)	219	213	276	270	262	256

(Ureh Price)

Notes : 1/ Commodity Price Forecast in Office Memorandam, Oct. 1988 World Bank.

2/ According to the Office Memorandam, Manufacturing unit value index in as follows.
1985: 100.0 1986: 118.3 1987: 130.0 1988: 140.7

3/ Fright Charge from Europe is $20/MT.
Insurance cost is estimated as 2% of FOB price.

Item	--- 1988 ---		--- 1995 ---		--- 2000 ---	
	Financial	Economic	Financial	Economic	Financial	Economic
Fright charge	20	20	20	20	20	20
Insurance	3	3	4	4	4	4
Total	23	23	24	24	24	24

4/ Port handling charge is assumed at 5% of CIF, Karachi.
Economic value is estimated using SCF 0.85.

5/ Food Controller, FALCD, Swat.

TABLE H-27 PRICE STRUCTURE OF DAP (18-46-0)

Item	Unit	1988		1995		2000	
		Financial	Economic	Financial	Economic	Financial	Economic
1. FOB, DAP, U.S. Gulf in 1985 constant price	US$/MT	139	139	188	188	194	194
2. Convert to 1988 constant price	"	195	195	265	265	272	272
3. Fright charge and insurance	"	34	34	35	35	35	35
4. CIF Price, Karachi	"	229	229	300	300	307	307
5. Convert to Rupees	RS/MT	4,809	4,809	6,300	6,300	6,447	6,447
6. Port handling charge	"	240	204	315	268	322	274
7. Railway cost between Karachi and Dargai	"	470	400	470	400	470	400
8. Truck cost Dargai to Mingora	"	75	65	75	65	75	65
9. Price at Mingora	"	5,594	5,478	7,160	7,033	7,314	7,184
10. Transport to farmgate	"	80	70	80	70	80	70
11. Farm gate price	"	5,674	5,548	7,240	7,103	7,394	7,256
	RS/bag(kg)	284	277	362	355	370	363

TABLE H-28 PRICE STRUCTURE OF POTTASIUM CHLORIDE (K: 60%)

Item	Unit	1988		1995		2000	
		Financial	Economic	Financial	Economic	Financial	Economic
1. FOB, Pottasium Chloride, Vancouver in 1985 constant	US$/MT	62	62	72	72	75	75
2. Convert to 1988 constant price	"	87	87	101	101	105	105
3. Fright charge and insurance	"	32	32	32	32	32	32
4. CIF Price, Karachi	"	119	119	133	133	137	137
5. Convert to Rupees	RS/MT	2,499	2,499	2,793	2,793	2,877	2,877
6. Port handling charge	"	125	106	140	119	144	122
7. Railway cost between Karachi and Dargai	"	470	400	470	400	470	400
8. Truck cost Dargai to Mingora	"	75	65	75	65	75	65
9. Price at Mingora	"	3,169	3,070	3,478	3,377	3,566	3,464
10. Transport to farmgate	"	80	70	80	70	80	70
11. Farm gate price	"	3,249	3,140	3,558	3,447	3,646	3,534
	RS/bag(kg)	162	157	178	172	182	177

TABLE H-29 PROJECT COST AND BENEFITS , PAKISTAN,SWAT,-MASTER PLAN EIRR -

(UNIT : MILLION RS.)

YEAR	PROJECT COST			BENEFITS	RETURN	PRESENT WORTH VALUE BY DISCOUNT RATE					
						8 %		10 %		12 %	
	CAPITAL	O & M	TOTAL			(COST)	(BENEFITS)	(COST)	(BENEFITS)	(COST)	(BENEFITS)
1 1990	56.7	0.0	56.7	0.0	-56.7	56.7	0.0	56.7	0.0	56.7	0.0
2 1991	92.3	0.0	92.3	4.0	-88.3	79.1	3.4	76.3	3.3	73.6	3.2
3 1992	58.4	0.0	58.4	10.2	-48.3	46.4	8.1	43.9	7.6	41.6	7.2
4 1993	50.6	0.0	50.6	19.3	-31.4	37.2	14.1	34.6	13.1	32.2	12.2
5 1994	50.6	0.0	50.6	36.3	-14.3	34.5	24.7	31.4	22.5	28.7	20.6
6 1995	83.1	0.0	83.1	50.5	-32.6	52.3	31.8	46.9	28.5	42.1	25.6
7 1996	87.4	0.0	87.4	74.1	-13.2	51.0	43.2	44.8	38.0	39.5	33.5
8 1997	82.6	0.0	82.6	97.8	15.2	44.6	52.8	38.5	45.6	33.3	39.5
9 1998	82.6	0.0	82.6	131.2	48.6	41.3	65.6	35.0	55.6	29.8	47.3
10 1999	82.6	0.0	82.6	162.8	80.3	38.2	75.4	31.8	62.8	26.6	52.4
11 2000	0.0	4.7	4.7	198.2	193.4	2.0	85.0	1.7	69.5	1.4	57.0
12 2001	0.0	4.7	4.7	229.3	224.5	1.9	91.0	1.5	73.1	1.2	58.8
13 2002	0.0	4.7	4.7	261.8	257.1	1.7	96.3	1.4	75.8	1.1	60.0
14 2003	0.0	4.7	4.7	289.0	284.2	1.6	98.4	1.2	76.1	1.0	59.1
15 2004	0.0	4.7	4.7	314.8	310.1	1.5	99.2	1.1	75.4	0.9	57.5
16 2005	0.0	4.7	4.7	336.5	331.8	1.4	98.2	1.0	73.2	0.8	54.9
17 2006	0.0	4.7	4.7	355.0	350.3	1.3	95.9	0.9	70.2	0.7	51.7
18 2007	0.0	4.7	4.7	367.2	362.4	1.2	91.9	0.9	66.0	0.6	47.7
19 2008	0.0	4.7	4.7	380.2	375.5	1.1	88.1	0.8	62.2	0.5	44.1
20 2009	0.0	4.7	4.7	388.7	383.9	1.0	83.4	0.7	57.8	0.5	40.3
21 2010	0.0	4.7	4.7	396.2	391.4	0.9	78.7	0.6	53.5	0.4	36.7
22 2011	0.0	4.7	4.7	401.3	396.6	0.9	73.8	0.6	49.3	0.4	33.2
23 2012	0.0	4.7	4.7	406.1	401.4	0.8	69.2	0.5	45.4	0.3	30.0
24 2013	0.0	4.7	4.7	408.4	403.7	0.7	64.4	0.5	41.5	0.3	26.9
25 2014	0.0	4.7	4.7	409.5	404.8	0.7	59.8	0.4	37.8	0.3	24.1
26 2015	0.0	4.7	4.7	410.8	406.1	0.6	55.5	0.4	34.5	0.2	21.6
27 2016	0.0	4.7	4.7	411.7	407.0	0.6	51.5	0.4	31.4	0.2	19.3
28 2017	0.0	4.7	4.7	412.6	407.9	0.5	47.8	0.3	28.6	0.2	17.3
29 2018	0.0	4.7	4.7	412.9	408.1	0.5	44.3	0.3	26.0	0.2	15.4
30 2019	0.0	4.7	4.7	413.5	408.8	0.5	41.1	0.3	23.7	0.2	13.8
31 2020	0.0	4.7	4.7	413.7	409.0	0.4	38.1	0.2	21.6	0.1	12.3
32 2021	0.0	4.7	4.7	413.7	409.0	0.4	35.3	0.2	19.6	0.1	11.0
33 2022	0.0	4.7	4.7	413.7	409.0	0.4	32.6	0.2	17.8	0.1	9.8
34 2023	0.0	4.7	4.7	413.7	409.0	0.3	30.2	0.2	16.2	0.1	8.8
35 2024	0.0	4.7	4.7	413.7	409.0	0.3	28.0	0.2	14.7	0.1	7.8
36 2025	0.0	4.7	4.7	413.7	409.0	0.3	25.9	0.2	13.4	0.1	7.0
37 2026	0.0	4.7	4.7	413.7	409.0	0.3	24.0	0.1	12.2	0.1	6.2
38 2027	0.0	4.7	4.7	413.7	409.0	0.3	22.2	0.1	11.1	0.1	5.6
39 2028	0.0	4.7	4.7	413.7	409.0	0.2	20.6	0.1	10.1	0.1	5.0
40 2029	0.0	4.7	4.7	413.7	409.0	0.2	19.0	0.1	9.1	0.1	4.4
41 2030	0.0	4.7	4.7	413.7	409.0	0.2	17.6	0.1	8.3	0.0	4.0
42 2031	0.0	4.7	4.7	413.7	409.0	0.2	16.3	0.1	7.6	0.0	3.5
43 2032	0.0	4.7	4.7	413.7	409.0	0.2	15.1	0.1	6.9	0.0	3.2
44 2033	0.0	4.7	4.7	413.7	409.0	0.2	14.0	0.1	6.2	0.0	2.8
45 2034	0.0	4.7	4.7	413.7	409.0	0.1	13.0	0.1	5.7	0.0	2.5
46 2035	0.0	4.7	4.7	413.7	409.0	0.1	12.0	0.1	5.2	0.0	2.3
47 2036	0.0	4.7	4.7	413.7	409.0	0.1	11.1	0.1	4.7	0.0	2.0
48 2037	0.0	4.7	4.7	413.7	409.0	0.1	10.3	0.0	4.3	0.0	1.8
49 2038	0.0	4.7	4.7	413.7	409.0	0.1	9.5	0.0	3.9	0.0	1.6
50 2039	0.0	4.7	4.7	413.7	409.0	0.1	8.8	0.0	3.5	0.0	1.4
TOTAL	726.8	189.2	916.0	16064.5	15148.5	507.5	2236.7	457.8	1550.0	416.6	1114.2

BENEFIT COST RATIO BY DISCOUNT RATE (B/C) = 4.41 (8%), 3.39 (10%), 2.67 (12%)
INTERNAL RATE OF RETURN (IRR) = 23.3 %

TABLE H-30 PROJECT COST AND BENEFITS , PAKISTAN,SWAT,-SANDAI ALOCH IRRIGATION-

(UNIT : 000 RS)

YEAR	PROJECT COST			BENEFITS	RETURN	PRESENT WORTH VALUE BY DISCOUNT RATE					
						8 %		10 %		12 %	
	CAPITAL	O & M	TOTAL			(COST)	(BENEFITS)	(COST)	(BENEFITS)	(COST)	(BENEFITS)
1 1990	103.0	0.0	103.0	0.0	-103.0	103.0	0.0	103.0	0.0	103.0	0.0
2 1991	908.0	0.0	908.0	0.0	-908.0	778.5	0.0	750.4	0.0	723.9	0.0
3 1992	0.0	11.0	11.0	161.0	150.0	8.7	127.8	8.3	121.0	7.8	114.6
4 1993	0.0	11.0	11.0	165.0	154.0	8.1	121.3	7.5	112.7	7.0	104.9
5 1994	0.0	11.0	11.0	168.0	157.0	7.5	114.3	6.8	104.3	6.2	95.3
6 1995	0.0	11.0	11.0	172.0	161.0	6.9	108.4	6.2	97.1	5.6	87.1
7 1996	0.0	11.0	11.0	175.0	164.0	6.4	102.1	5.6	89.8	5.0	79.2
8 1997	0.0	11.0	11.0	181.0	170.0	5.9	97.8	5.1	84.4	4.4	73.1
9 1998	0.0	11.0	11.0	157.0	146.0	5.5	78.5	4.7	66.6	4.0	56.6
10 1999	0.0	11.0	11.0	150.0	139.0	5.1	69.5	4.2	57.8	3.5	48.3
11 2000	0.0	11.0	11.0	148.0	137.0	4.7	63.5	3.9	51.9	3.2	42.5
12 2001	0.0	11.0	11.0	153.0	142.0	4.4	60.8	3.5	48.8	2.8	39.3
13 2002	0.0	11.0	11.0	158.0	147.0	4.0	58.1	3.2	45.8	2.5	36.2
14 2003	0.0	11.0	11.0	152.0	141.0	3.7	51.8	2.9	40.0	2.3	31.1
15 2004	0.0	11.0	11.0	152.0	141.0	3.5	47.9	2.6	36.4	2.0	27.8
16 2005	0.0	11.0	11.0	152.0	141.0	3.2	44.4	2.4	33.1	1.8	24.8
17 2006	0.0	11.0	11.0	153.0	142.0	3.0	41.4	2.2	30.3	1.6	22.3
18 2007	0.0	11.0	11.0	153.0	142.0	2.8	38.3	2.0	27.5	1.4	19.9
19 2008	0.0	11.0	11.0	153.0	142.0	2.5	35.5	1.8	25.0	1.3	17.8
20 2009	0.0	11.0	11.0	153.0	142.0	2.4	32.8	1.6	22.7	1.1	15.9
21 2010	0.0	11.0	11.0	153.0	142.0	2.2	30.4	1.5	20.7	1.0	14.2
22 2011	0.0	11.0	11.0	153.0	142.0	2.0	28.1	1.4	18.8	0.9	12.6
23 2012	0.0	11.0	11.0	153.0	142.0	1.9	26.1	1.2	17.1	0.8	11.3
24 2013	0.0	11.0	11.0	153.0	142.0	1.7	24.1	1.1	15.5	0.7	10.1
25 2014	0.0	11.0	11.0	153.0	142.0	1.6	22.3	1.0	14.1	0.6	9.0
26 2015	0.0	11.0	11.0	153.0	142.0	1.5	20.7	0.9	12.8	0.6	8.0
27 2016	0.0	11.0	11.0	153.0	142.0	1.4	19.2	0.8	11.7	0.5	7.2
28 2017	0.0	11.0	11.0	153.0	142.0	1.3	17.7	0.8	10.6	0.5	6.4
29 2018	0.0	11.0	11.0	153.0	142.0	1.2	16.4	0.7	9.6	0.4	5.7
30 2019	0.0	11.0	11.0	153.0	142.0	1.1	15.2	0.6	8.8	0.4	5.1
31 2020	0.0	11.0	11.0	153.0	142.0	1.0	14.1	0.6	8.0	0.3	4.6
32 2021	0.0	11.0	11.0	153.0	142.0	0.9	13.0	0.5	7.2	0.3	4.1
33 2022	0.0	11.0	11.0	153.0	142.0	0.9	12.1	0.5	6.6	0.3	3.6
34 2023	0.0	11.0	11.0	153.0	142.0	0.8	11.2	0.4	6.0	0.2	3.2
35 2024	0.0	11.0	11.0	153.0	142.0	0.7	10.3	0.4	5.4	0.2	2.9
36 2025	0.0	11.0	11.0	153.0	142.0	0.7	9.6	0.4	4.9	0.2	2.6
37 2026	0.0	11.0	11.0	153.0	142.0	0.6	8.9	0.3	4.5	0.2	2.3
38 2027	0.0	11.0	11.0	153.0	142.0	0.6	8.2	0.3	4.1	0.1	2.1
39 2028	0.0	11.0	11.0	153.0	142.0	0.5	7.6	0.3	3.7	0.1	1.8
40 2029	0.0	11.0	11.0	153.0	142.0	0.5	7.0	0.2	3.4	0.1	1.6
41 2030	0.0	11.0	11.0	153.0	142.0	0.5	6.5	0.2	3.1	0.1	1.5
42 2031	0.0	11.0	11.0	153.0	142.0	0.4	6.0	0.2	2.8	0.1	1.3
43 2032	0.0	11.0	11.0	153.0	142.0	0.4	5.6	0.2	2.5	0.1	1.2
44 2033	0.0	11.0	11.0	153.0	142.0	0.4	5.2	0.2	2.3	0.1	1.0
45 2034	0.0	11.0	11.0	153.0	142.0	0.3	4.8	0.2	2.1	0.1	0.9
46 2035	0.0	11.0	11.0	153.0	142.0	0.3	4.4	0.1	1.9	0.1	0.8
47 2036	0.0	11.0	11.0	153.0	142.0	0.3	4.1	0.1	1.7	0.1	0.7
48 2037	0.0	11.0	11.0	153.0	142.0	0.3	3.8	0.1	1.6	0.0	0.7
49 2038	0.0	11.0	11.0	153.0	142.0	0.3	3.5	0.1	1.4	0.0	0.6
50 2039	0.0	11.0	11.0	153.0	142.0	0.2	3.3	0.1	1.3	0.0	0.5
TOTAL	1011.0	528.0	1539.0	7446.0	5907.0	996.4	1663.6	943.4	1309.6	899.6	1064.4

BENEFIT COST RATIO BY DISCOUNT RATE (B/C) = 1.67 (8%), 1.39 (10%), 1.18 (12%)

INTERNAL RATE OF RETURN (IRR) = 12.5 %

TABLE H-31 PROJECT COST AND BENEFITS , PAKISTAN,SWAT,-CYOGA IRRIGATION-

(UNIT : OOO RS)

YEAR	PROJECT COST			BENEFITS	RETURN	PRESENT WORTH VALUE BY DISCOUNT RATE					
						8 %		10 %		12 %	
	CAPITAL	O & M	TOTAL			(COST)	(BENEFITS)	(COST)	(BENEFITS)	(COST)	(BENEFITS)
1 1990	52.0	0.0	52.0	0.0	-52.0	52.0	0.0	52.0	0.0	52.0	0.0
2 1991	483.0	0.0	483.0	0.0	-483.0	414.1	0.0	399.2	0.0	385.0	0.0
3 1992	0.0	5.0	5.0	78.0	73.0	4.0	61.9	3.8	58.6	3.6	55.5
4 1993	0.0	5.0	5.0	80.0	75.0	3.7	58.8	3.4	54.6	3.2	50.8
5 1994	0.0	5.0	5.0	82.0	77.0	3.4	55.8	3.1	50.9	2.8	46.5
6 1995	0.0	5.0	5.0	83.0	78.0	3.2	52.3	2.8	46.9	2.5	42.1
7 1996	0.0	5.0	5.0	84.0	79.0	2.9	49.0	2.6	43.1	2.3	38.0
8 1997	0.0	5.0	5.0	88.0	83.0	2.7	47.5	2.3	41.1	2.0	35.5
9 1998	0.0	5.0	5.0	76.0	71.0	2.5	38.0	2.1	32.2	1.8	27.4
10 1999	0.0	5.0	5.0	75.0	70.0	2.3	34.7	1.9	28.9	1.6	24.1
11 2000	0.0	5.0	5.0	72.0	67.0	2.1	30.9	1.8	25.2	1.4	20.7
12 2001	0.0	5.0	5.0	74.0	69.0	2.0	29.4	1.6	23.6	1.3	19.0
13 2002	0.0	5.0	5.0	76.0	71.0	1.8	27.9	1.4	22.0	1.1	17.4
14 2003	0.0	5.0	5.0	73.0	68.0	1.7	24.9	1.3	19.2	1.0	14.9
15 2004	0.0	5.0	5.0	74.0	69.0	1.6	23.3	1.2	17.7	0.9	13.5
16 2005	0.0	5.0	5.0	73.0	68.0	1.5	21.3	1.1	15.9	0.8	11.9
17 2006	0.0	5.0	5.0	74.0	69.0	1.4	20.0	1.0	14.6	0.7	10.8
18 2007	0.0	5.0	5.0	74.0	69.0	1.3	18.5	0.9	13.3	0.7	9.6
19 2008	0.0	5.0	5.0	74.0	69.0	1.2	17.1	0.8	12.1	0.6	8.6
20 2009	0.0	5.0	5.0	74.0	69.0	1.1	15.9	0.7	11.0	0.5	7.7
21 2010	0.0	5.0	5.0	74.0	69.0	1.0	14.7	0.7	10.0	0.5	6.8
22 2011	0.0	5.0	5.0	74.0	69.0	0.9	13.6	0.6	9.1	0.4	6.1
23 2012	0.0	5.0	5.0	74.0	69.0	0.9	12.6	0.6	8.3	0.4	5.5
24 2013	0.0	5.0	5.0	74.0	69.0	0.8	11.7	0.5	7.5	0.3	4.9
25 2014	0.0	5.0	5.0	74.0	69.0	0.7	10.8	0.5	6.8	0.3	4.4
26 2015	0.0	5.0	5.0	74.0	69.0	0.7	10.0	0.4	6.2	0.3	3.9
27 2016	0.0	5.0	5.0	74.0	69.0	0.6	9.3	0.4	5.6	0.2	3.5
28 2017	0.0	5.0	5.0	74.0	69.0	0.6	8.6	0.3	5.1	0.2	3.1
29 2018	0.0	5.0	5.0	74.0	69.0	0.5	7.9	0.3	4.7	0.2	2.8
30 2019	0.0	5.0	5.0	74.0	69.0	0.5	7.4	0.3	4.2	0.2	2.5
31 2020	0.0	5.0	5.0	74.0	69.0	0.5	6.8	0.3	3.9	0.1	2.2
32 2021	0.0	5.0	5.0	74.0	69.0	0.4	6.3	0.2	3.5	0.1	2.0
33 2022	0.0	5.0	5.0	74.0	69.0	0.4	5.8	0.2	3.2	0.1	1.8
34 2023	0.0	5.0	5.0	74.0	69.0	0.4	5.4	0.2	2.9	0.1	1.6
35 2024	0.0	5.0	5.0	74.0	69.0	0.3	5.0	0.2	2.6	0.1	1.4
36 2025	0.0	5.0	5.0	74.0	69.0	0.3	4.6	0.2	2.4	0.1	1.3
37 2026	0.0	5.0	5.0	74.0	69.0	0.3	4.3	0.1	2.2	0.1	1.1
38 2027	0.0	5.0	5.0	74.0	69.0	0.3	4.0	0.1	2.0	0.1	1.0
39 2028	0.0	5.0	5.0	74.0	69.0	0.2	3.7	0.1	1.8	0.1	0.9
40 2029	0.0	5.0	5.0	74.0	69.0	0.2	3.4	0.1	1.6	0.1	0.8
41 2030	0.0	5.0	5.0	74.0	69.0	0.2	3.2	0.1	1.5	0.0	0.7
42 2031	0.0	5.0	5.0	74.0	69.0	0.2	2.9	0.1	1.4	0.0	0.6
43 2032	0.0	5.0	5.0	74.0	69.0	0.2	2.7	0.1	1.2	0.0	0.6
44 2033	0.0	5.0	5.0	74.0	69.0	0.2	2.5	0.1	1.1	0.0	0.5
45 2034	0.0	5.0	5.0	74.0	69.0	0.2	2.3	0.1	1.0	0.0	0.5
46 2035	0.0	5.0	5.0	74.0	69.0	0.1	2.1	0.1	0.9	0.0	0.4
47 2036	0.0	5.0	5.0	74.0	69.0	0.1	2.0	0.1	0.8	0.0	0.4
48 2037	0.0	5.0	5.0	74.0	69.0	0.1	1.8	0.1	0.8	0.0	0.3
49 2038	0.0	5.0	5.0	74.0	69.0	0.1	1.7	0.0	0.7	0.0	0.3
50 2039	0.0	5.0	5.0	74.0	69.0	0.1	1.6	0.0	0.6	0.0	0.3
TOTAL	535.0	240.0	775.0	3604.0	2829.0	518.3	806.1	492.1	634.7	470.1	516.0

BENEFIT COST RATIO BY DISCOUNT RATE (B/C) = 1.56 (8%), 1.29 (10%), 1.10 (12%)
INTERNAL RATE OF RETURN (IRR) = 13.3 %

TABLE H-32 PROJECT COST AND BENEFITS , PAKISTAN/SWAT/-CHAKESAR IRRIGATION-

(UNIT : 000 RS)

YEAR	PROJECT COST			BENEFITS	RETURN	PRESENT WORTH VALUE BY DISCOUNT RATE					
						8 %		10 %		12 %	
	CAPITAL	O & M	TOTAL			(COST)	(BENEFITS)	(COST)	(BENEFITS)	(COST)	(BENEFITS)
1 1990	39.0	0.0	39.0	0.0	-39.0	39.0	0.0	39.0	0.0	39.0	0.0
2 1991	400.0	0.0	400.0	0.0	-400.0	342.9	0.0	330.6	0.0	318.9	0.0
3 1992	0.0	4.0	4.0	50.0	46.0	3.2	39.7	3.0	37.6	2.8	35.6
4 1993	0.0	4.0	4.0	52.0	48.0	2.9	38.2	2.7	35.5	2.5	33.0
5 1994	0.0	4.0	4.0	52.0	48.0	2.7	35.4	2.5	32.3	2.3	29.5
6 1995	0.0	4.0	4.0	52.0	48.0	2.5	32.8	2.3	29.4	2.0	26.3
7 1996	0.0	4.0	4.0	54.0	50.0	2.3	31.5	2.1	27.7	1.8	24.4
8 1997	0.0	4.0	4.0	55.0	51.0	2.2	29.7	1.9	25.7	1.6	22.2
9 1998	0.0	4.0	4.0	56.0	52.0	2.0	28.0	1.7	23.7	1.4	20.2
10 1999	0.0	4.0	4.0	49.0	45.0	1.9	22.7	1.5	18.9	1.3	15.8
11 2000	0.0	4.0	4.0	49.0	45.0	1.7	21.0	1.4	17.2	1.1	14.1
12 2001	0.0	4.0	4.0	47.0	43.0	1.6	18.7	1.3	15.0	1.0	12.1
13 2002	0.0	4.0	4.0	48.0	44.0	1.5	17.6	1.2	13.9	0.9	11.0
14 2003	0.0	4.0	4.0	49.0	45.0	1.4	16.7	1.1	12.9	0.8	10.0
15 2004	0.0	4.0	4.0	47.0	43.0	1.3	14.8	1.0	11.3	0.7	8.6
16 2005	0.0	4.0	4.0	47.0	43.0	1.2	13.7	0.9	10.2	0.7	7.7
17 2006	0.0	4.0	4.0	48.0	44.0	1.1	13.0	0.8	9.5	0.6	7.0
18 2007	0.0	4.0	4.0	48.0	44.0	1.0	12.0	0.7	8.6	0.5	6.2
19 2008	0.0	4.0	4.0	48.0	44.0	0.9	11.1	0.7	7.8	0.5	5.6
20 2009	0.0	4.0	4.0	48.0	44.0	0.9	10.3	0.6	7.1	0.4	5.0
21 2010	0.0	4.0	4.0	48.0	44.0	0.8	9.5	0.5	6.5	0.4	4.4
22 2011	0.0	4.0	4.0	48.0	44.0	0.7	8.8	0.5	5.9	0.3	4.0
23 2012	0.0	4.0	4.0	48.0	44.0	0.7	8.2	0.4	5.4	0.3	3.5
24 2013	0.0	4.0	4.0	48.0	44.0	0.6	7.6	0.4	4.9	0.3	3.2
25 2014	0.0	4.0	4.0	48.0	44.0	0.6	7.0	0.4	4.4	0.2	2.8
26 2015	0.0	4.0	4.0	48.0	44.0	0.5	6.5	0.3	4.0	0.2	2.5
27 2016	0.0	4.0	4.0	48.0	44.0	0.5	6.0	0.3	3.7	0.2	2.3
28 2017	0.0	4.0	4.0	48.0	44.0	0.5	5.6	0.3	3.3	0.2	2.0
29 2018	0.0	4.0	4.0	48.0	44.0	0.4	5.2	0.3	3.0	0.1	1.8
30 2019	0.0	4.0	4.0	48.0	44.0	0.4	4.8	0.2	2.8	0.1	1.6
31 2020	0.0	4.0	4.0	48.0	44.0	0.4	4.4	0.2	2.5	0.1	1.4
32 2021	0.0	4.0	4.0	48.0	44.0	0.3	4.1	0.2	2.3	0.1	1.3
33 2022	0.0	4.0	4.0	48.0	44.0	0.3	3.8	0.2	2.1	0.1	1.1
34 2023	0.0	4.0	4.0	48.0	44.0	0.3	3.5	0.2	1.9	0.1	1.0
35 2024	0.0	4.0	4.0	48.0	44.0	0.3	3.2	0.1	1.7	0.1	0.9
36 2025	0.0	4.0	4.0	48.0	44.0	0.3	3.0	0.1	1.6	0.1	0.8
37 2026	0.0	4.0	4.0	48.0	44.0	0.2	2.8	0.1	1.4	0.1	0.7
38 2027	0.0	4.0	4.0	48.0	44.0	0.2	2.6	0.1	1.3	0.1	0.6
39 2028	0.0	4.0	4.0	48.0	44.0	0.2	2.4	0.1	1.2	0.0	0.6
40 2029	0.0	4.0	4.0	48.0	44.0	0.2	2.2	0.1	1.1	0.0	0.5
41 2030	0.0	4.0	4.0	48.0	44.0	0.2	2.0	0.1	1.0	0.0	0.5
42 2031	0.0	4.0	4.0	48.0	44.0	0.2	1.9	0.1	0.9	0.0	0.4
43 2032	0.0	4.0	4.0	48.0	44.0	0.1	1.8	0.1	0.8	0.0	0.4
44 2033	0.0	4.0	4.0	48.0	44.0	0.1	1.6	0.1	0.7	0.0	0.3
45 2034	0.0	4.0	4.0	48.0	44.0	0.1	1.5	0.1	0.7	0.0	0.3
46 2035	0.0	4.0	4.0	48.0	44.0	0.1	1.4	0.0	0.6	0.0	0.3
47 2036	0.0	4.0	4.0	48.0	44.0	0.1	1.3	0.0	0.5	0.0	0.2
48 2037	0.0	4.0	4.0	48.0	44.0	0.1	1.2	0.0	0.5	0.0	0.2
49 2038	0.0	4.0	4.0	48.0	44.0	0.1	1.1	0.0	0.4	0.0	0.2
50 2039	0.0	4.0	4.0	48.0	44.0	0.1	1.0	0.0	0.4	0.0	0.2
TOTAL	439.0	192.0	631.0	2339.0	1708.0	423.7	522.9	402.3	411.5	384.3	334.4

BENEFIT COST RATIO BY DISCOUNT RATE (B/C) = 1.23 (8%), 1.02 (10%), 0.87 (12%)

TABLE H-33 PROJECT COST AND BENEFITS , ECONOMIC JUSTIFICATION FOR CIRDP- INTEGRATED IRRIGATION SCHEME

(UNIT : MILLION RS.)

YEAR	PROJECT COST			BENEFITS	RETURN	PRESENT WORTH VALUE BY DISCOUNT RATE					
						8 %		10 %		12 %	
	CAPITAL	O & M	TOTAL			(COST)	(BENEFITS)	(COST)	(BENEFITS)	(COST)	(BENEFITS)
1 1990	1.3	0.0	1.3	0.0	-1.3	1.3	0.0	1.3	0.0	1.3	0.0
2 1991	2.2	0.0	2.2	0.0	-2.2	1.9	0.0	1.8	0.0	1.8	0.0
3 1992	1.2	0.0	1.3	0.2	-1.1	1.0	0.2	1.0	0.2	0.9	0.2
4 1993	1.2	0.1	1.3	0.2	-1.1	1.0	0.2	0.9	0.2	0.8	0.2
5 1994	1.2	0.1	1.3	0.3	-1.0	0.9	0.2	0.8	0.2	0.7	0.2
6 1995	1.3	0.1	1.4	0.4	-1.0	0.9	0.3	0.8	0.2	0.7	0.2
7 1996	2.1	0.1	2.2	0.5	-1.7	1.3	0.3	1.1	0.3	1.0	0.2
8 1997	1.2	0.1	1.4	0.7	-0.6	0.7	0.4	0.6	0.3	0.6	0.3
9 1998	1.2	0.1	1.4	0.8	-0.6	0.7	0.4	0.6	0.3	0.5	0.3
10 1999	1.2	0.1	1.4	1.0	-0.4	0.6	0.5	0.5	0.4	0.4	0.3
11 2000	0.0	0.1	0.1	1.2	1.0	0.1	0.5	0.0	0.4	0.0	0.3
12 2001	0.0	0.1	0.1	1.3	1.2	0.1	0.5	0.0	0.4	0.0	0.3
13 2002	0.0	0.1	0.1	1.5	1.3	0.0	0.5	0.0	0.4	0.0	0.3
14 2003	0.0	0.1	0.1	1.6	1.5	0.0	0.5	0.0	0.4	0.0	0.3
15 2004	0.0	0.1	0.1	1.7	1.6	0.0	0.5	0.0	0.4	0.0	0.3
16 2005	0.0	0.1	0.1	1.8	1.7	0.0	0.5	0.0	0.4	0.0	0.3
17 2006	0.0	0.1	0.1	1.8	1.7	0.0	0.5	0.0	0.4	0.0	0.3
18 2007	0.0	0.1	0.1	2.0	1.9	0.0	0.5	0.0	0.4	0.0	0.3
19 2008	0.0	0.1	0.1	2.1	2.0	0.0	0.5	0.0	0.3	0.0	0.2
20 2009	0.0	0.1	0.1	2.1	2.0	0.0	0.5	0.0	0.3	0.0	0.2
21 2010	0.0	0.1	0.1	2.2	2.1	0.0	0.4	0.0	0.3	0.0	0.2
22 2011	0.0	0.1	0.1	2.2	2.1	0.0	0.4	0.0	0.3	0.0	0.2
23 2012	0.0	0.1	0.1	2.3	2.1	0.0	0.4	0.0	0.3	0.0	0.2
24 2013	0.0	0.1	0.1	2.3	2.1	0.0	0.4	0.0	0.2	0.0	0.1
25 2014	0.0	0.1	0.1	2.3	2.1	0.0	0.3	0.0	0.2	0.0	0.1
26 2015	0.0	0.1	0.1	2.3	2.1	0.0	0.3	0.0	0.2	0.0	0.1
27 2016	0.0	0.1	0.1	2.3	2.1	0.0	0.3	0.0	0.2	0.0	0.1
28 2017	0.0	0.1	0.1	2.3	2.1	0.0	0.3	0.0	0.2	0.0	0.1
29 2018	0.0	0.1	0.1	2.3	2.1	0.0	0.2	0.0	0.1	0.0	0.1
30 2019	0.0	0.1	0.1	2.3	2.1	0.0	0.2	0.0	0.1	0.0	0.1
31 2020	0.0	0.1	0.1	2.3	2.1	0.0	0.2	0.0	0.1	0.0	0.1
32 2021	0.0	0.1	0.1	2.3	2.1	0.0	0.2	0.0	0.1	0.0	0.1
33 2022	0.0	0.1	0.1	2.3	2.1	0.0	0.2	0.0	0.1	0.0	0.1
34 2023	0.0	0.1	0.1	2.3	2.1	0.0	0.2	0.0	0.1	0.0	0.0
35 2024	0.0	0.1	0.1	2.3	2.1	0.0	0.2	0.0	0.1	0.0	0.0
36 2025	0.0	0.1	0.1	2.3	2.1	0.0	0.1	0.0	0.1	0.0	0.0
37 2026	0.0	0.1	0.1	2.3	2.1	0.0	0.1	0.0	0.1	0.0	0.0
38 2027	0.0	0.1	0.1	2.3	2.1	0.0	0.1	0.0	0.1	0.0	0.0
39 2028	0.0	0.1	0.1	2.3	2.1	0.0	0.1	0.0	0.1	0.0	0.0
40 2029	0.0	0.1	0.1	2.3	2.1	0.0	0.1	0.0	0.1	0.0	0.0
41 2030	0.0	0.1	0.1	2.3	2.1	0.0	0.1	0.0	0.0	0.0	0.0
42 2031	0.0	0.1	0.1	2.3	2.1	0.0	0.1	0.0	0.0	0.0	0.0
43 2032	0.0	0.1	0.1	2.3	2.1	0.0	0.1	0.0	0.0	0.0	0.0
44 2033	0.0	0.1	0.1	2.3	2.1	0.0	0.1	0.0	0.0	0.0	0.0
45 2034	0.0	0.1	0.1	2.3	2.1	0.0	0.1	0.0	0.0	0.0	0.0
46 2035	0.0	0.1	0.1	2.3	2.1	0.0	0.1	0.0	0.0	0.0	0.0
47 2036	0.0	0.1	0.1	2.3	2.1	0.0	0.1	0.0	0.0	0.0	0.0
48 2037	0.0	0.1	0.1	2.3	2.1	0.0	0.1	0.0	0.0	0.0	0.0
49 2038	0.0	0.1	0.1	2.3	2.1	0.0	0.1	0.0	0.0	0.0	0.0
50 2039	0.0	0.1	0.1	2.3	2.1	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	14.4	6.2	20.6	89.5	68.9	11.1	13.0	10.0	9.1	9.2	6.7

BENEFIT COST RATIO BY DISCOUNT RATE (B/C) = 1.17 (8%), 0.91 (10%), 0.73 (12%)

INTERNAL RATE OF RETURN (IRR) = 9.2 %

TABLE H-34 SOCIO-ECONOMICAL CRITERIA ROAD PRIORITY, SIRDP

Road Distance	Required by U.C.	C.H.D. Plan	Length (Km)	Population of wards to be benefited (2003)	Household to be benefited (2003)	Population per Km of road length	Cultivated Area of wards to be benefited (ha)	Cultivated Area per Km (ha)	Expectation of traffic diverted from other road	Improvement of accessibility to medical facilities
(A) Required by U.C. (New construction)										
1. Chakesar-Dandi	0		30	28,300	3,780	945	1,720	57	high	easy
2. Chakesar-Dandi	0		20	15,400	2,060	770	1,204	60	high	easy
3. Katkot-Multa Banda	0	0	5	5,000	660	1,000	358	72	low	very easy
4. Dangkool-Saida	0		2	2,300	310	1,150	595	298	low	very easy
5. Derai-Gunagar	0		8	6,700	890	840	429	54	low	easy
6. Opal-Dandai	0		15	15,200	2,030	1,010	862	57	low	not improve
7. Mairagai-Gosbanda	0		6	4,700	630	780	474	79	medium	very easy
8. Choga-Bena-Kot	0	0	20	10,980	1,460	550	1,167	58	low	very eash
9. Dehri-Bengali	0		10	12,000	1,600	1,200	1,528	153	low	very easy
10. Awari-Kodona	0		8	4,850	650	600	401	50	low	very easy
11. Alloch-Gumiyal	0		8	6,640	880	830	776	97	low	easy
12. Derai-Faizu-Batu	0		8	9,330	1,240	1,160	1,227	153	low	very easy
13. Derai-Kun Banda-Barabari	0		6	3,270	440	540	380	63	low	easy
14. Martung-Pashrol	0		6	3,140	420	520	306	51	low	very easy
(Improvement)										
1. Choga-Inwar	0		6	8,300	1,100	1,380	1,251	208	low	easy
2. Choga-Kuz Pau	0		6	7,900	1,050	1,310	1,222	203	low	easy
3. Alloch-Choga	0	0	6	9,400	1,250	1,560	1,157	193	high	very easy
(B) Government Plan (New construction)										
1. Katkore-Multa Banda		0	5	(Same (A) -3)						
5. Kabargram-Martung		0	19	6,500	870	340	597	31	low	easy
11. Choga-Machkandai		0	4	5,500	730	1,380	531	133	low	very easy
15. Choga-Biana		0	7	(Same (A) -8)						
(Improvement)										
3. Dehri-Martung			30	75,700	10,100	2,520	7,215	240	high	
4. Dehri-Chakesar-Karora	0	0	50.5	67,400	8,990	1,330	6,028	119	high	

TABLE H-35 NORMAL TRAFFIC BENEFITS ON TRUNK ROAD PROJECT, SIRDP 1/

(Unit: Million RS)

Project Year	Year	Daily traffic Without Project	Vehicle Operating Cost (RS/km) Without Project	Vehicle Operating Cost (RS/km) With Project	Daily Bus Passengers (man/86.5km) Without Project	ANNUAL INCREMENTAL BENEFITS: V O C saving 6/ Case 1	V O C saving 6/ Case 2	Passenger time saving 7/ Case 1	Passenger time saving 7/ Case 2	Total Case 1	Total Case 2
	Present	134	12.0	5.4	1,400	8/	8/				
		2/	4/	4/	5/						
1	92	160 3/				5.14	5.45	3.00	3.06	8.14	8.51
2	93	169				5.45	5.85	3.18	3.31	8.63	9.16
3	94	179				5.81	6.29	3.37	3.57	9.18	9.86
4	95	190				6.10	6.83	3.58	3.86	9.68	10.69
5	96	201				6.53	7.51	3.79	4.16	10.32	11.67
6	97	213				6.89	8.05	4.02	4.50	10.91	12.55
7	98	226				7.35	8.79	4.26	4.86	11.61	13.65
8	99	240				7.71	9.50	4.52	5.24	12.23	14.74
9	2000	254				8.19	10.27	4.79	5.66	12.98	15.93
10	01	270				8.62	10.84	5.07	6.12	13.69	16.96
11	02	286				9.16	11.74	5.38	6.61	14.54	18.35
12	03	303				9.76	12.19	5.70	7.13	15.46	19.32
13	04	321				10.35	13.65	6.04	7.71	16.39	21.36
14	05	340				10.97	14.78	6.41	8.32	17.38	23.10

Notes: 1/ Normal traffic excludes traffic generated by the road project, because the latter traffic benefit is counted in such projects as agriculture sector.

2/ Traffic survey, July 19, 1989 conducted by U.C.

Road Section	Daily traffic	Distance (km)
Dehrai - Chakesar	11	50.5
Martung - Aloch	24	20
Chakesar - Karora	37	include in Dehrai-Chakesar
Aloch - Choga	15	6
Total	87	76.5

3/ Annual growth rate of number of motor vehicles of difference classes (on road) government & private owned are estimated at 12.5% for 1979/80 to 1985/86 in NWFP and 14.0% in SWAT District (Development Statistics, NWFP, 1986). As the project area is mountanous area, annual growth rate will be assumed at about 6% to 8%.

4/ Vehicle operating costs were assumed under following condition.

i) Pick-up, 2,400 CC, diesel

ii) VOC without project

(overhead cost + running cost)/100,000 km. 10 years ----- 12 RS/km

iii) VOC with Project

a. overhead cost is saved through extension of economic life of car and economic driving distance.

b. running cost is saved through speed up (20 km to 40 km) and conversion of road condition from gravel to pavement.

c. cost saving rate is estimated at about 55 %.

d. VOC with project. 12 RS/km x (1-0.55) ----- 5.4 RS/km

5/ Daily bus passengers at present is assumed as follows.

(Destination)	(Bus way per day)	(Passengers per one bus)	(Passengers per day)
Maratung - Mingora	4 x 2 = 8	50	400
Aloch - Mingora	4 x 2 = 8	50	400
Chgkesar - Mingora	4 x 2 = 8	50	400
Aloch - Choga	4 x 2 = 8	25	200
Total			1,400

6/ Annual vehicle operating cost saving were assumed as follows.

i) Daily traffic on Martung-Aloch, Dehrai-Chakesar, Chakesar-Karora, Aloch-Choga.

ii) Vehicle operating cost (VOC) saving 6.6 RS/km

iii) Distance: Martung-Aloch 20 km, Dehrai-Chakesar-Karora, Aloch-Choga. Chakesar-Karora 25.5 km, Aloch-Choga 6 km.

iv) Daily VOC saving ----- i) x ii) x iii)

v) Annual VOC saving ---- iv) x 365 days

7/ Annual bus passenger time saving were assumed as follows.

i) Passenger without project by year are forecasted using daily growth rate of 6% case and 8% case.

ii) Saving time on 76.5 km is estimated at 1.91 hr per bus passenger. (76.5 km/20 km per hr. - 76.5 km/40 km per hr.)

iii) Time saving value is economic wage rate of unskilled labor 23 RS/8 hr = 2.9 RS/hr.

iv) Annual bus passenger time saving value is estimated as i) x ii) x iii) x 365 days.

8/ Case 1 was estimated in using annual growth rate of 6% with daily traffic and daily bus passenger., Case 2 8%.

TABLE H-36 EIRR OF TRUNK ROAD PROJECT, SIRDP - CASE 1

Project Year	Project Cost	O & M Cost	Total Cost	Incremental Benefit	Return	Present Worth Value 8 %	Present Worth Value 9 %
1	12.82	-	12.82	0.07	- 12.75	- 11.80	- 11.70
2	65.27	0.37	65.64	0.90	- 64.74	- 55.50	- 54.49
3	38.46	0.26	40.72	6.79	- 33.93	- 26.93	- 26.20
4	-	3.38	3.38	8.63	5.25	3.86	3.72
5	-	3.38	3.38	9.18	5.80	3.95	3.77
6	-	3.38	3.38	9.68	6.30	3.97	3.76
7	-	3.38	3.38	10.32	6.94	4.05	3.80
8	-	3.38	3.38	10.91	7.53	4.07	3.78
9	-	3.38	3.38	11.61	8.23	4.12	3.79
10	-	3.38	3.38	12.23	8.85	4.10	3.74
11	-	3.38	3.38	12.98	9.60	4.12	3.72
12	-	3.38	3.38	13.69	10.31	4.09	3.67
13	-	3.38	3.38	14.54	11.16	4.10	3.64
14	-	3.38	3.38	15.46	12.08	4.11	3.62
15	-	3.38	3.38	16.39	13.01	4.10	3.57
16	-	3.38	3.38	17.38	14.00		
17	-	3.38	3.38	17.38	14.00		
"	-	"	"	"	"		
'	-	"	"	"	"	51.44	40.62
50	-	3.38	3.38	17.38	14.00		
Total	116.55	161.49	278.04	761.68	483.64	5.85	- 7.19

$$EIRR = 0.08 + \frac{5.89}{5.89 + 7.19} \times 0.01 = 8.5\ \%$$

TABLE H-37 EIRR OF TRUNK ROAD PROJECT, SIRDP - CASE 2

Project Year	Project Cost	O & M Cost	Total Cost	Incremental Benefit	Return	Present Worth Value 10 %	Present Worth Value 11 %
1	12.82	-	12.28	0.08	- 12.74	- 11.58	- 11.48
2	65.27	0.37	65.64	0.94	- 64.70	- 53.47	- 52.51
3	38.46	2.26	40.72	7.10	- 33.62	- 25.24	- 24.58
4	-	3.38	3.38	9.16	5.78	3.95	3.81
5	-	3.38	3.38	9.86	6.48	4.02	3.85
6	-	3.38	3.38	10.69	7.31	4.13	3.91
7	-	3.38	3.38	11.67	8.29	4.25	3.95
8	-	3.38	3.38	12.55	9.17	4.28	3.98
9	-	3.38	3.38	13.65	10.27	4.36	4.01
10	-	3.38	3.38	14.74	11.36	4.38	4.00
11	-	3.38	3.38	15.93	12.55	4.40	3.98
12	-	3.38	3.38	16.96	13.58	4.33	3.88
13	-	3.38	3.38	18.35	14.97	4.34	3.85
14	-	3.38	3.38	19.32	15.94	4.14	3.70
15	-	3.38	3.38	21.36	17.98	4.30	3.76
16	-	3.38	3.38	23.10	19.72		
17	-	3.38	3.38	23.10	19.72		
'	-	"	"	"	"		
'	-	"	"	"	"	45.53	36.50
50	-	3.38	3.38	23.10	19.72		
Total	116.55	161.49	278.04	990.86	712.82	6.12	- 5.39

$$EIRR = 0.1 + \frac{6.12}{6.12 + 5.39} \times 0.01 = 10.5\ \%$$

TABLE H-38 PROJECT COST AND BENEFITS , PAKISTAN,SWAT,-JAMBAR DERAI HYDER POWER
(UNIT : 000 RS.)

YEAR	PROJECT COST			BENEFITS	RETURN	PRESENT WORTH VALUE BY DISCOUNT RATE					
						8 %		10 %		12 %	
	CAPITAL	O & M	TOTAL			(COST)	(BENEFITS)	(COST)	(BENEFITS)	(COST)	(BENEFITS)
1 1990	3116.0	0.0	3116.0	0.0	-3116.0	3116.0	0.0	3116.0	0.0	3116.0	0.0
2 1991	17658.0	0.0	17658.0	3226.0	-14432.0	15138.9	2765.8	14593.4	2666.1	14076.9	2571.7
3 1992	0.0	110.0	110.0	1847.0	1737.0	87.3	1466.2	82.6	1387.7	78.3	1314.7
4 1993	0.0	110.0	110.0	1847.0	1737.0	80.9	1357.6	75.1	1261.5	69.9	1173.8
5 1994	0.0	110.0	110.0	1847.0	1737.0	74.9	1257.0	68.3	1146.8	62.4	1048.0
6 1995	0.0	110.0	110.0	1847.0	1737.0	69.3	1163.9	62.1	1042.6	55.7	935.7
7 1996	0.0	110.0	110.0	1847.0	1737.0	64.2	1077.7	56.4	947.8	49.8	835.5
8 1997	0.0	110.0	110.0	1847.0	1737.0	59.4	997.9	51.3	861.6	44.4	746.0
9 1998	0.0	110.0	110.0	1847.0	1737.0	55.0	924.0	46.7	783.3	39.7	666.0
10 1999	0.0	110.0	110.0	1847.0	1737.0	51.0	855.5	42.4	712.1	35.4	594.7
11 2000	0.0	110.0	110.0	1847.0	1737.0	47.2	792.2	38.6	647.4	31.6	531.0
12 2001	0.0	110.0	110.0	1847.0	1737.0	43.7	733.5	35.0	588.5	28.2	474.1
13 2002	0.0	110.0	110.0	1847.0	1737.0	40.4	679.1	31.9	535.0	25.2	423.3
14 2003	0.0	110.0	110.0	1847.0	1737.0	37.5	628.8	29.0	486.4	22.5	377.9
15 2004	0.0	110.0	110.0	1847.0	1737.0	34.7	582.3	26.3	442.2	20.1	337.4
16 2005	0.0	110.0	110.0	1847.0	1737.0	32.1	539.1	23.9	402.0	17.9	301.3
17 2006	0.0	110.0	110.0	4775.0	4665.0	29.7	1290.5	21.8	944.7	16.0	695.5
18 2007	0.0	110.0	110.0	1847.0	1737.0	27.5	462.2	19.8	332.2	14.3	240.2
19 2008	0.0	110.0	110.0	1847.0	1737.0	25.5	428.0	18.0	302.0	12.8	214.5
20 2009	0.0	110.0	110.0	1847.0	1737.0	23.6	396.3	16.4	274.5	11.4	191.5
21 2010	0.0	110.0	110.0	1847.0	1737.0	21.9	366.9	14.9	249.6	10.2	171.0
22 2011	0.0	110.0	110.0	1847.0	1737.0	20.2	339.7	13.5	226.9	9.1	152.6
23 2012	0.0	110.0	110.0	1847.0	1737.0	18.7	314.6	12.3	206.3	8.1	136.3
24 2013	0.0	110.0	110.0	1847.0	1737.0	17.3	291.3	11.2	187.5	7.2	121.7
25 2014	0.0	110.0	110.0	1847.0	1737.0	16.1	269.7	10.2	170.5	6.5	108.6
26 2015	0.0	110.0	110.0	1847.0	1737.0	14.9	249.7	9.2	155.0	5.8	97.0
27 2016	0.0	110.0	110.0	1847.0	1737.0	13.8	231.2	8.4	140.9	5.2	86.6
28 2017	0.0	110.0	110.0	1847.0	1737.0	12.8	214.1	7.6	128.1	4.6	77.3
29 2018	0.0	110.0	110.0	1847.0	1737.0	11.8	198.2	6.9	116.4	4.1	69.0
30 2019	0.0	110.0	110.0	1847.0	1737.0	10.9	183.6	6.3	105.9	3.7	61.6
31 2020	0.0	110.0	110.0	1847.0	1737.0	10.1	170.0	5.7	96.2	3.3	55.0
32 2021	0.0	110.0	110.0	1847.0	1737.0	9.4	157.4	5.2	87.5	2.9	49.1
33 2022	0.0	110.0	110.0	1847.0	1737.0	8.7	145.7	4.7	79.5	2.6	43.9
34 2023	0.0	110.0	110.0	1847.0	1737.0	8.0	134.9	4.3	72.3	2.3	39.2
35 2024	0.0	110.0	110.0	1847.0	1737.0	7.4	124.9	3.9	65.7	2.1	35.0
36 2025	0.0	110.0	110.0	1847.0	1737.0	6.9	115.7	3.6	59.8	1.9	31.2
37 2026	0.0	110.0	110.0	1847.0	1737.0	6.4	107.1	3.2	54.3	1.7	27.9
TOTAL	20774.0	3850.0	24624.0	70799.0	46175.0	19354.0	22012.3	18586.1	17966.9	17909.8	15036.0

BENEFIT COST RATIO BY DISCOUNT RATE (B/C) = 1.14 (8%), 0.97 (10%), 0.84 (12%)
INTERNAL RATE OF RETURN (IRR) = 9.6 %

TABLE H-39 FINANCIAL JUSTIFICATION OF VILLAGE WATER SUPPLY DEVELOPMENT SCHEME
- CONSTRUCTION WORK PER ONE YEAR IN 1990 TO 1995 -

(Unit: Million RS)

Project Year	Project Cost	O & M Cost	Total Cost	Annual Water Charge	Incre. Benefit	Present Worth Value 10 %	Present Worth Value 11 %
1/	2/	3/		4/			
1	11.00	-	11.00	-	- 11.00	- 10.00	- 9.91
2	-	0.17	0.17	0.95	0.78	0.64	0.63
3	-	0.17	0.17	1.03	0.86	0.65	0.63
4	-	0.17	0.17	1.13	0.96	0.65	0.63
5	-	0.17	0.17	1.28	1.11	0.69	0.66
6	-	0.17	0.17	1.42	1.25	0.70	0.67
7	-	0.17	0.17	1.51	1.34	0.69	0.65
8	-	0.17	0.17	1.61	1.44	0.67	0.62
9	-	0.17	0.17	1.70	1.53	0.64	0.60
10	-	0.17	0.17	1.80	1.63	0.63	0.57
11	-	0.17	0.17	1.89	1.72		
	-	"	"	"	"		
	-	"	"	"	"	4.07	3.02
	-	"	"	"	"		
20	-	0.17	0.17	1.89	1.72		
Total	11.00	3.23	14.23	31.33	17.10	0.03	- 1.23

$$FIRR = 0.10 + \frac{0.03}{0.03 + 1.23} \times 0.01 = 10\ \%$$

Notes : 1/ Economic life year is assumed at 10 years.

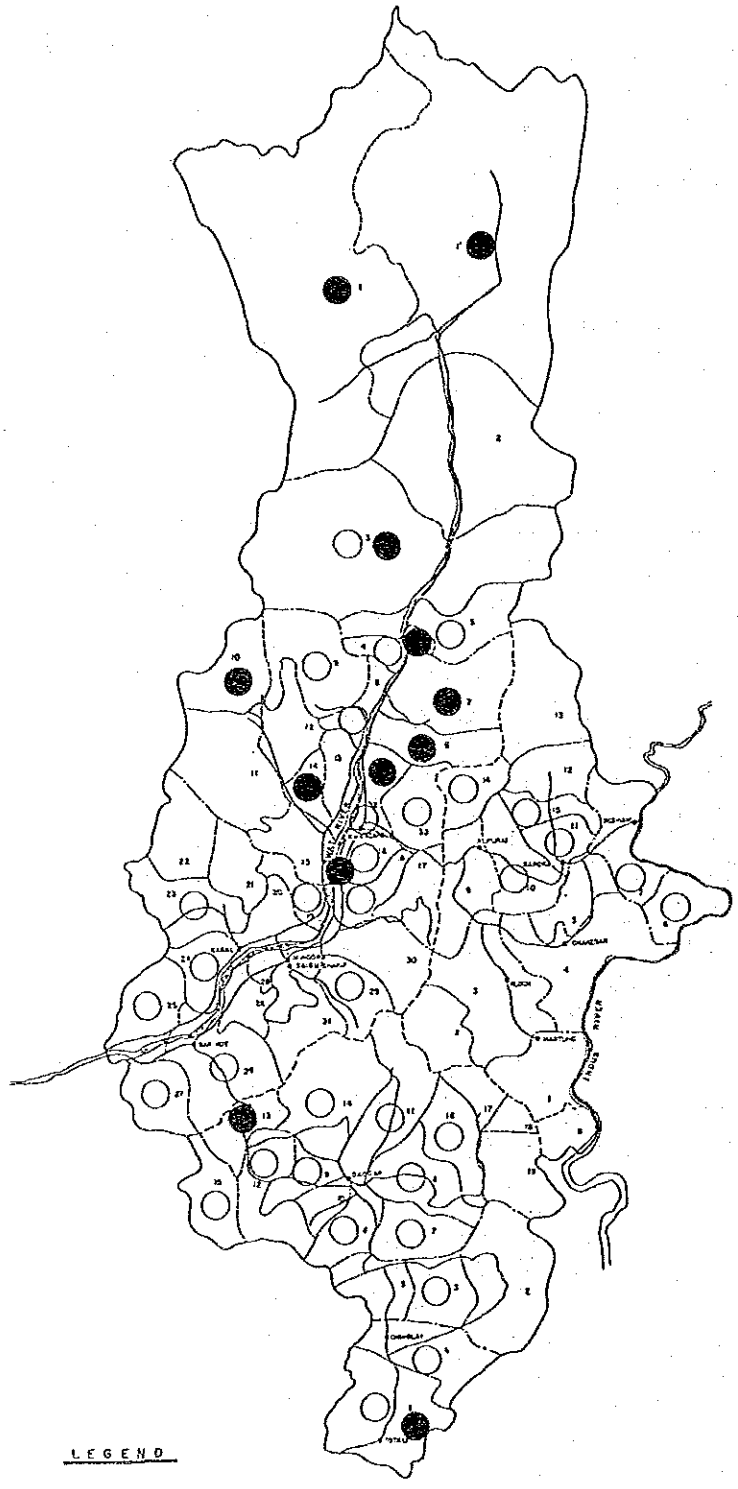
2/ Implementation schedule in 1990 to 1995 is costed at 35,260 RS x 1,000 for 8,600 houses.
This study is conducted on one year construction.
35,260 RS x 1,000 x 1.3 x 1.2 = 55,000 RS x 1,000
55,000 RS x 1,000/5 years = 11,000 RS x 1,000/year = 11.0 RS million

3/ 11,000 RS x 1,000/year x 0.015 = 165 RS x 1,000 ≒ 0.17 RS million.

4/ Annual water charge is estimated as follows.
i. Willing water charge is 4 to 5% of farm income.
ii. According to the farm management survey in SIRDP (Sample 30) conducted by JICA study team (Aug. 1989), farm income per sample is as follows.
- Average sample farm size ----- 16.34 acre
  rainfed 6.75 acre, irrigated 2.73 acre, upland 6.86 acre
- Gross crop income ---------- 17,357 RS
  rice 7,203 RS, maize 4,708 RS, wheat 5,446 RS
- Farm income is assumed at 17,357 RS x 0.80 = 13,885 RS
- Willing water charge per year- 13,885 RS x 0.04 = 555 RS
- Number of family ---------- 16 persons
- Water consumption per day per house
  16 persons x 0.6 (adult equivalent) x 90 ℓ = 0.864 m^3
- Water consumption per year per house
  0.864 m^3 x 365 days = 233.6 m^3
- Willing water charge per m^3 at present
  555 RS/233.6 m^3 ≒ 2.3 RS/m^3
- Willing water charge per m^3 with the project
  13,885 RS x 200% x 0.04 = 1,110 RS/year
  1,110 RS/233.6 m^3 = 4.7 RS/m^3
- Water requirement per year on 1,720 house (8,600/5 year)
  233.6 m^3 x 1,720 house = 401,792 m^3
- Annual water charge 401,792 m^3 x 4.7 RS/m^3 = 1.89 RS million
- This revenue shall be attained by 10 years after completion of the works.
- Water charge revenue by year is estimated as follows.

Year	Payable rate	Revenue
1	50 %	0.95 RS million
2	55 %	1.03 "
3	60 %	1.13 "
4	68 %	1.28 "
5	75 %	1.42 "
6	80 %	1.51 "
7	85 %	1.61 "
8	90 %	1.70 "
9	95 %	1.80 "
10	100 %	1.89 "

IRRIGATION



LIST OF SUB-DIVISION WISE 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 Bahrain
				3 Bahrain
				4 Madyan
				5 Chail Shahgram
		II	Matta	8 Mohammad Khel
				9 Marokhel
				10 Sinakhel
				11 Behlolikhel Matta
				12 Mullahkhel No 2*
				13 Ranzan Khel
				14 Mullahkhel No 1
				15 Nazar Khel
			Shawarakhola	6 Fatehpur
				7 Barbampattai
				12 Khadukhel
				33 Barakhel Marii Khel
			Charbagh	16 Gulibagh
				17 Kalia Jabba
				18 Charbagh
		III	Kanan	19 Bar Attia Mingolai
				20 Kus Attia Mingolai
				21 Sahibkhel
			Kabal	22 Shah Kheral
				23 Totano Kandai
				24 Jhakhel Kabal
			Barikot	25 Shamozai
				26 Jhakhel Barikot
				27 Mastkhel Kota
			Mingola	28 Jhakhel Qasbar
				28* Barath Khel Odigram
				29 Loharai
				30 Jhazara Rashjol
				31 Islampur
				(24 Mingola/Saidu Sharif)
	Shangla Par Sub-Div.	IV	Alpuri	9 Bar Ghurband
				10 Kus Ghurband
				11 Kuthana
				12 Serkana
				13 Pirkhana
				14 Lilonai
				15 Shahpur
		V	Chakesar	4 Bar Pan Chakesar
				5 Kus Pan Chakesar
			Puran	2 Bakhorai
				3 Puran
			Martung	1 Martung
				6 Behjol Khel
		VI	Besham	8 Gandai
				7 Besham
	Buner Sub-Div.	VII	Daggar	9 Elai
				10 Karapa
				11 Daggar
				12 Torcanrak
			Gadezai	13 Malakhel
				14 Gadezai
				15 Jhakhel Salarai
			Gagra	6 Borezai
				7 Baftata
				8 Gagra
			Chagharzai	16 Batara
				17 Gul Kandai
				18 Sorai
				19 Nandir
		VIII	Chamla/ Inzozai	2 Inzozai
				3 Bawagai
				5 Chamla
		IX	Khudukhel	1 Totalai
				4 Khudukhel

LEGEND

- BOUNDARY OF STUDY AREA
- BOUNDARY OF SUB-DIVISION
- BOUNDARY OF UNION COUNCIL
- RIVERS
- ROAD AND MAIN TOWN

SCALE

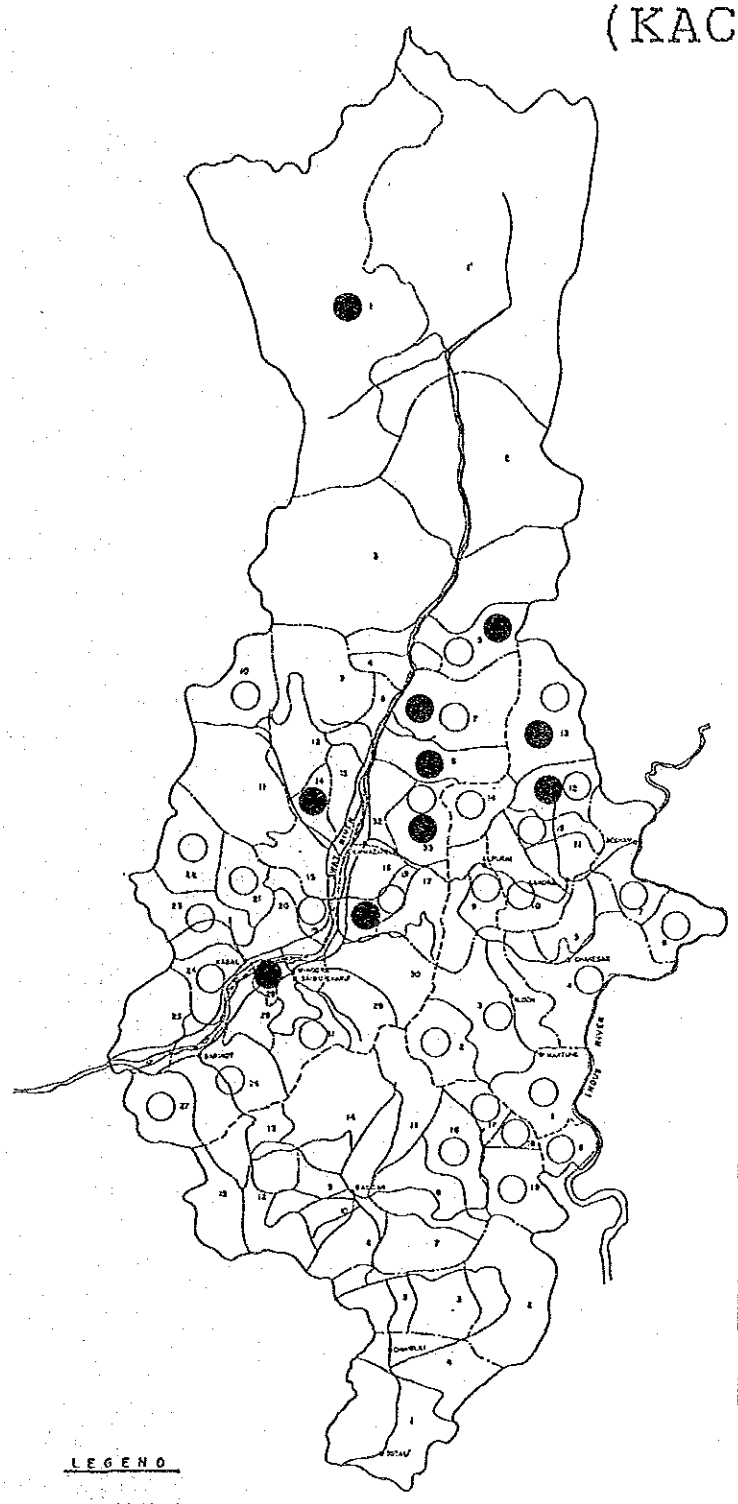
IRRIGATION

	LEGEND
○	NEW SCHEME
●	IMPROVEMENT or EXTENSION

FIGURE H-1 PRIORITY REQUIREMENTS FROM UNION COUNCIL

FARM TO MARKET ROAD

(KACHA ROAD)



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
			Jahzaila	2 Balakot
				3 Bahrain
				4 Madyan
				5 Chail Shahgram
		II	Matta	8 Mohmand Khel
				9 Marakhel
				10 Sikandkhel
				11 Bahlolkhel Matta
				12 Nullahkhel No 2
				13 Kanan Khel
				14 Nullahkhel No 1
				15 Nasar Khel
			Khwazakhela	6 Fatehpur
				7 Barkanpottai
				22 Khadukhel
				23 Barakhel Marji Khel
			Charbagh	16 Gulibagh
				17 Kalam Jabba
				18 Charbagh
		III	Kanju	19 Bar Attla Mingolai
				20 Lor Attla Mingolai
				21 Sahibkhel
			Kabal	22 Shah Kheral
				23 Tatano Bandai
				24 Jhakhel Kabal
			Barikot	25 Shamozai
				26 Jhakhel Barikot
				27 Nasarkhel Kota
			Mingola	28 Jhakhel Qasbar
				28' Barath Khel Odigram
				29 Kokarai
				30 Jhanzra Bankifal
				31 Islampur
				(34 Mingola/Saidu Sharif)
	Shangla Par Sub-Div.	IV	Alpuri	9 Bar Gharbaad
				10 Lor Gharbaad
				11 Lwakana
				12 Barkana
				13 Pirkana
				14 Lilonai
				15 Shahpur
		V	Chakesar	4 Lar Pan Chakesar
				5 Bar Pan Chakesar
			Puran	2 Kakhonai
				3 Puran
			Kartung	1 Kartung
				6 Bahlol Khel
		VI	Besham	8 Dandai
				7 Besham
	Swar Sub-Div.	VII	Dargai	9 Elai
				10 Karaya
				11 Dargai
				12 Torwarsak
			Gadezai	13 Kalpithai
				14 Gadezai
				15 Jhakhel Salarai
			Gagra	6 Barezai
				7 Bajkata
				8 Gagra
			Chagharzai	16 Batara
				17 Gul Bandai
				18 Sarai
				19 Bandir
		VIII	Chenla/ Inazai	2 Inazai
				3 Bavazai
				5 Chenla
		IX	Khudukhel	1 Totalai
				4 Khudukhel

LEGEND

- BOUNDARY OF STUDY AREA
- BOUNDARY OF SUB-DIVISION
- BOUNDARY OF UNION COUNCIL
- RIVERS
- ROAD AND MAIN TOWN

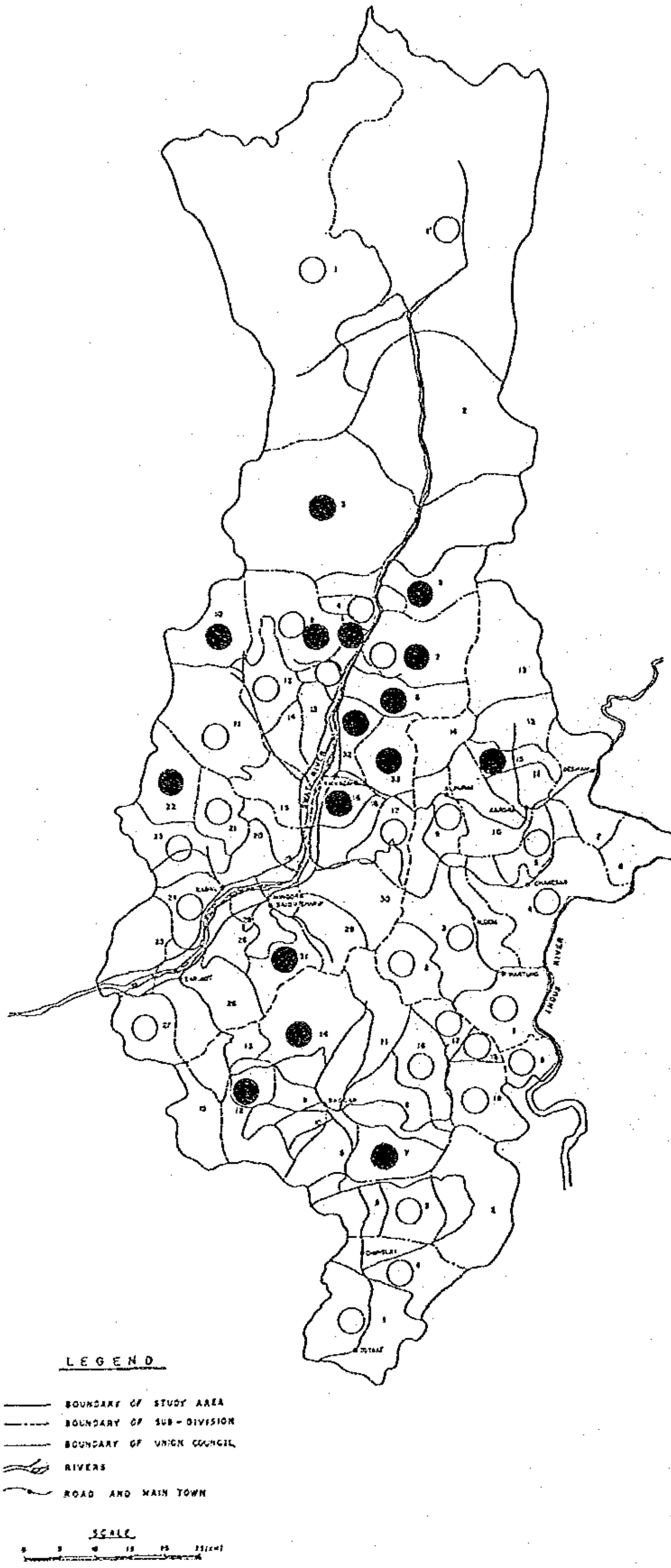
SCALE

FARM TO MARKET ROAD (KACHA ROAD)

LEGEND	
	NEW SCHEME
	EXTENSION

FIGURE H-2 PRIORITY REQUIREMENTS FROM UNION COUNCIL

ELECTRICITY



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

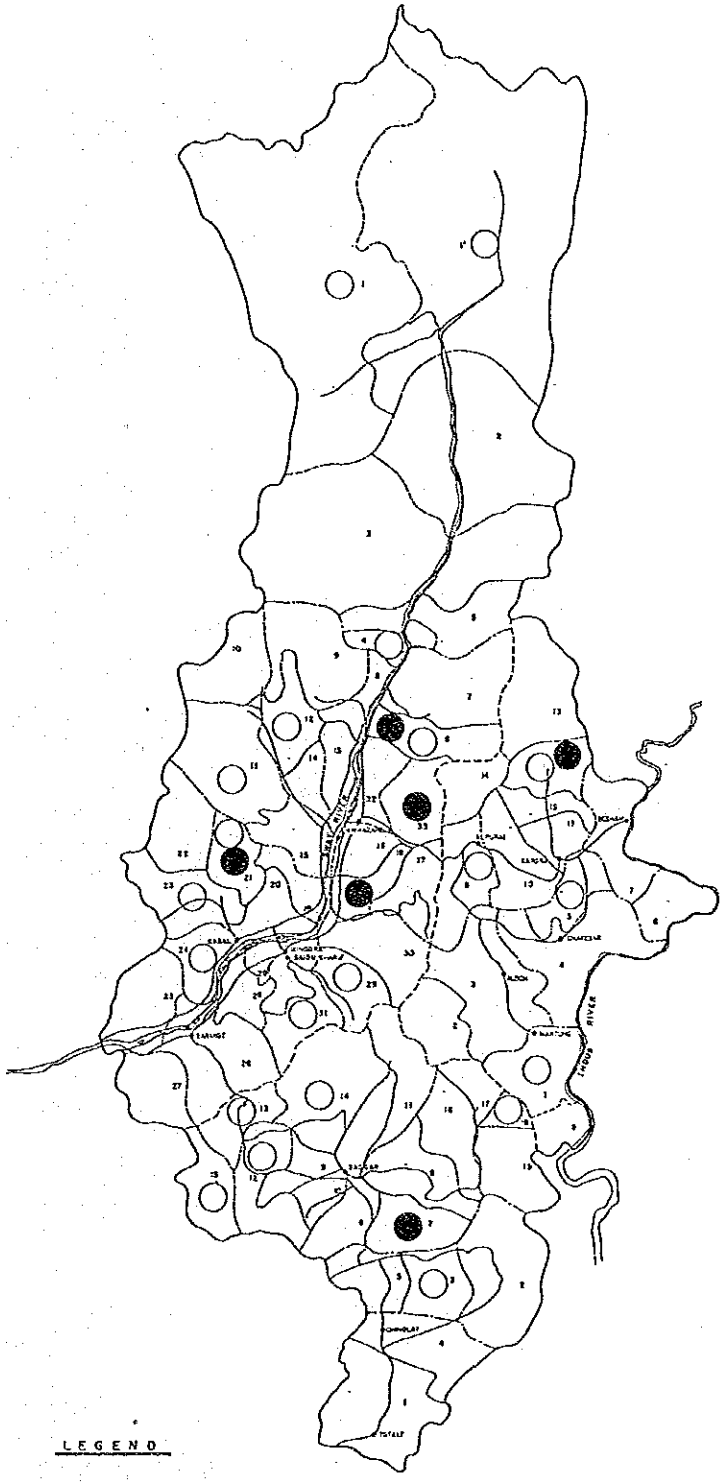
DISTRICT	SUB-DIVISION	ZONE	TEHSIL/ SUB-TEHSIL	UNION COUNCIL
Swat	Swat Sub-Div.	I	Kalam	1 Utror
				1' Kalam
			Bahrain	2 Balakot
				3 Bahrain
				4 Madyan
				5 Chail Shahgram
		II	Matta	8 Mohammad Khel
				9 Kerakhel
				10 Sinakhel
				11 Behlolkhel Matta
				12 Mullakhel No 2
				13 Hassan Khel
				14 Mullakhel No 1
				15 Nazar Khel
			Khwazakhela	6 Fatehpur
				7 Sarhaspattai
				32 Khadukhel
				33 Barakhel Karli Khel
			Charbagh	16 Gulibagh
				17 Malam Jabba
				18 Charbagh
		III	Kanoo	19 Bar Attia Mingolai
				20 Kuz Attia Mingolai
				21 Sahibkhel
			Kabal	22 Shah Dheral
				23 Totano Bandai
				24 Abakhel Kabal
			Barikot	25 Shamozai
				26 Abakhel Baricot
				27 Musakhel Kota
			Mingola	28 Abakhel Qambar
				28' Barath Khel Odigram
				29 Kokarai
				30 Shamara Basikhel
				31 Islampur
				(34 Mingola/Saidu Sharif)
	Shangla Par Sub-Div.	IV	Alpuri	9 Bar Ghorband
				10 Kuz Ghorband
				11 Awakana
				12 Barkana
				13 Pirkana
				14 Lilonai
				15 Shahpur
		V	Chakesar	4 Kuz Pan Chakesar
				5 Bar Pan Chakesar
			Puran	2 Makhozai
				3 Puran
			Martung	1 Martung
				6 Behlol Khel
		VI	Besham	8 Dandai
				7 Besham
	Buner Sub-Div.	VII	Daggar	9 Elai
				10 Karapa
				11 Daggar
				12 Torwarsak
			Gadezai	13 Malakhel
				14 Gadezai
				15 Abakhel Salarzai
			Gagra	6 Narozai
				7 Bajkata
				8 Gagra
			Chagharzai	16 Batara
				17 Gul Bandai
				18 Surai
				19 Bandir
		VIII	Chamla/ Amazai	2 Amazai
				3 Kawagai
				5 Chamla
		IX	Khudukhel	1 Totalai
				4 Khudukhel

ELECTRICITY

LEGEND	
○	NEW SCHEME
●	EXTENSION

FIGURE H-3 - PRIORITY REQUIREMENTS FROM UNION COUNCIL

WATER SUPPLY



LIST OF SUB-DIVISION VISED 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	6 Mohmand Khel
				9 Barikhel
				10 Sinakhel
				11 Bahlolkhel Matta
				12 Nullahkhel No I
				13 Hassan Khel
				14 Nullahkhel No I
				15 Kotar Khel
			Shawarakhela	6 Fatehpur
				7 Sachaupattai
				32 Khadakhel
				33 Barakhel Karli Khel
			Charbagh	28 Gulibagh
				17 Kalaw Jabba
				18 Charbagh
		III	Kanju	19 Bar Ittila Mingotai
				20 Kas Ittila Mingotai
				21 Sahibkhel
			Kabal	22 Shah Kheral
				23 Totano Bandai
				24 Shahkot Kabal
			Barikot	25 Shamozai
				26 Shahkhel Baricot
				27 Rustakhel Kota
			Mingola	28 Shahkot Qambar
				29* Barath Khel Odigram
				29 Kokarai
				30 Jhinaro Saulkhel
				31 Inlaspur
				(34 Mingola/Saidu Sharif)
	Shangla Par Sub-Div.	IV	Alpuri	9 Bar Gharband
				10 Kas Gharband
				11 Kushana
				12 Sarkana
				13 Pirkana
				14 Lilonai
				15 Shahpur
		V	Chakesar	4 Bar Pas Chakesar
				5 Kas Pas Chakesar
			Puran	2 Kahonai
				3 Puran
			Martung	1 Martung
				8 Bahlol Khel
		VI	Besham	9 Pandai
				7 Besham
	Buner Sub-Div.	VII	Daggar	9 Elai
				10 Karapa
				11 Daggar
				12 Torwarsak
			Gadezai	13 Malakhel
				14 Gadezai
				15 Shahkot Salarai
			Gagra	8 Noorsai
				7 Rajkota
				5 Gagra
			Chagharzai	16 Asturo
				17 Gul Bandai
				18 Soral
				19 Bandla
		VIII	Chanla/ Asarai	2 Jawai
				3 Nawagai
				5 Chanla
		IX	Khudakhel	1 Totaloi
				4 Khudakhel

LEGEND

- BOUNDARY OF STUDY AREA
- BOUNDARY OF SUB-DIVISION
- BOUNDARY OF UNION COUNCIL
- RIVERS
- ROAD AND MAIN TOWN

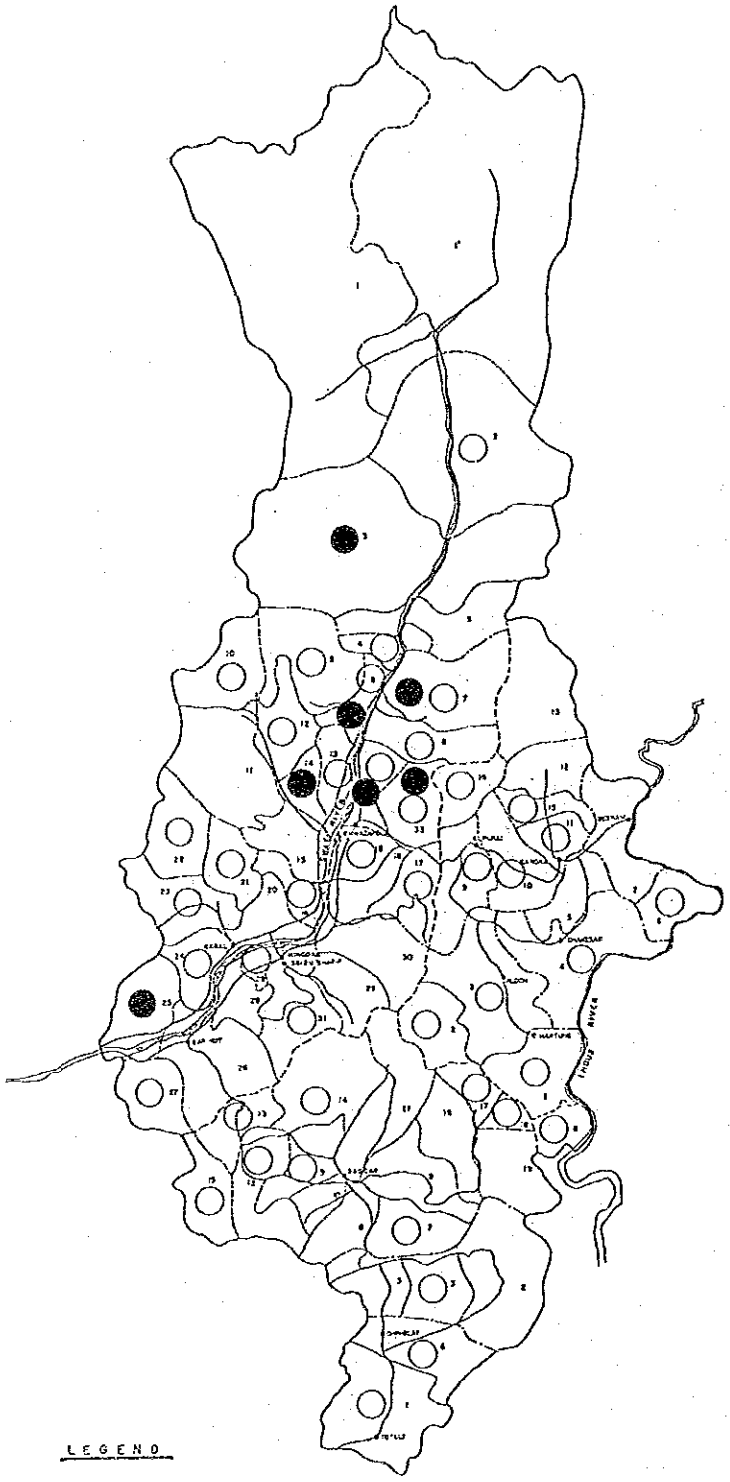
SCALE

WATER SUPPLY

LEGEND
NEW SCHEME
EXTENSION

FIGURE H-4 PRIORITY REQUIREMENTS FROM UNION COUNCIL

HEALTH CENTRE



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	1 Kalakot
				3 Bahrain
				4 Nadyan
				5 Chail Shahgram
		II	Matta	8 Mohamad Khel
				9 Karakhel
				10 Sinakhel
				11 Behlolkhel Matta
				12 Rollakhkhel No 2
				13 Kanzan Khel
				14 Zollakhkhel No 1
				15 Nazar Khel
			Khwazakhela	6 Fatehpur
				7 Barkanpattai
				32 Khudukhel
				33 Barakhel Kacli Khel
			Charbagh	16 Gulibagh
				17 Malang Jabba
				18 Charbagh
		III	Kanan	19 Bar Attila Mingolai
				20 Kas Attila Mingolai
				21 Sabibkhel
			Kabal	22 Shah Kheral
				23 Totano Bandai
				24 Akakhel Kabal
			Barikot	25 Shamozai
				26 Akakhel Barikot
				27 Nasakhel Kota
			Mingola	28 Akakhel Gaobar
				29* Barath Khel Odigram
				29 Kaharai
				30 Ahmadabad Bankjal
				31 Islampur
				(34 Mingola/Saidu Sharif)
	Shangla Par Sub-Div.	IV	Alpuri	9 Bar Ghorband
				10 Kas Ghorband
				11 Kuhana
				12 Berkana
				13 Pirkana
				14 Ulloonai
				15 Shahpur
		V	Chakesar	4 Bar Pas Chakesar
				5 Kas Pas Chakesar
			Puran	2 Kahbonai
				3 Puran
			Kartung	1 Kartung
				8 Sehjol Khel
		VI	Besham	6 Gandai
				7 Besham
	Buner Sub-Div.	VII	Dagger	9 Elai
				10 Karapa
				11 Dagger
				12 Torwarsak
			Gadezai	13 Kalalkhel
				14 Gadezai
				15 Akakhel Saharai
			Gagra	6 Morazai
				7 Rajkata
				8 Gagra
			Chagharzai	16 Batara
				17 Gul Kandai
				18 Sorai
				19 Sandie
		VIII	Chanla/ Amazai	2 Amazai
				3 Pawagal
				5 Chanla
		IX	Khudukhel	1 Totalai
				4 Khudukhel

LEGEND

- BOUNDARY OF STUDY AREA
- BOUNDARY OF SUB-DIVISION
- BOUNDARY OF UNION COUNCIL
- RIVERS
- ROAD AND MAIN TOWN

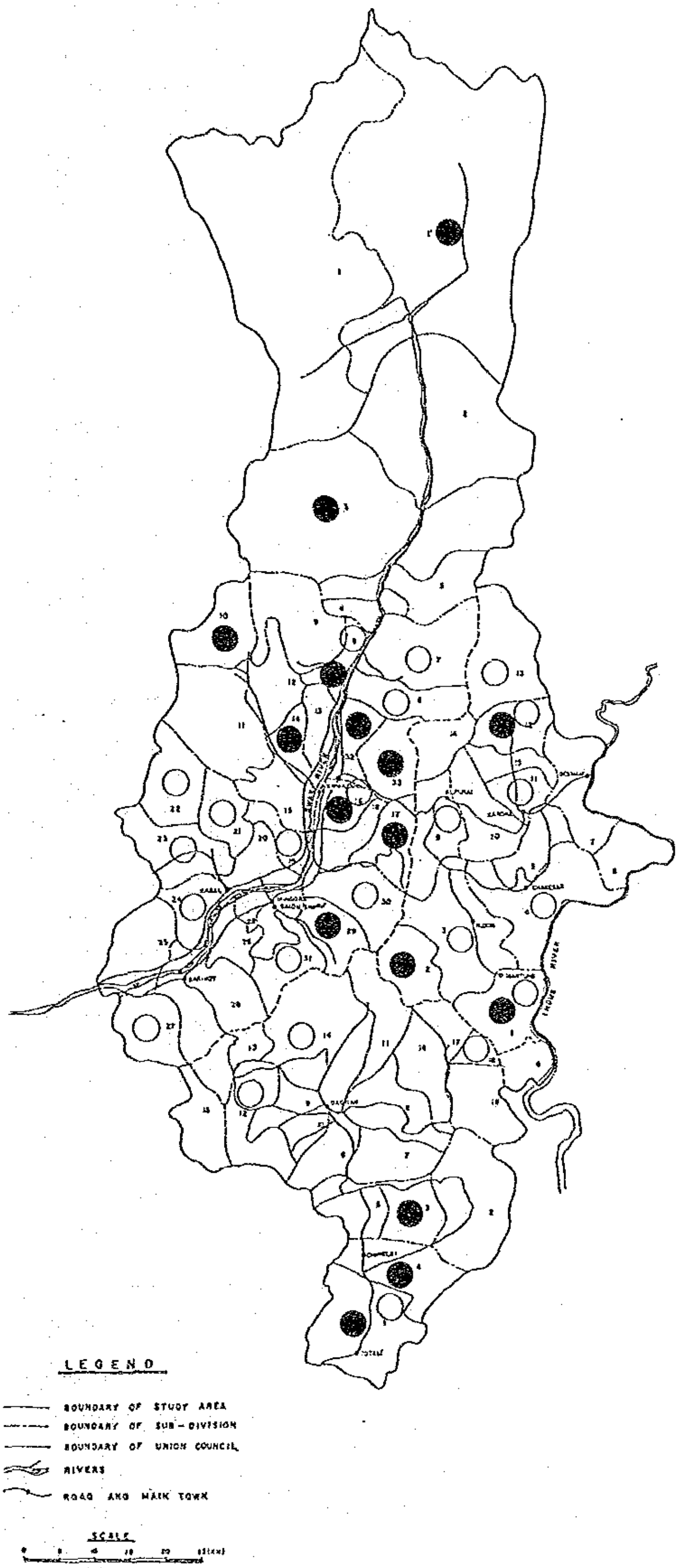
SCALE

HEALTH CENTRE

	LEGEND
○	NEW SCHEME
●	EXTENSION

FIGURE H-5 PRIORITY REQUIREMENTS FROM UNION COUNCIL

EDUCATION



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 Sohlolkhel Matta
				12 Mullahkhel No 2
				13 Hassan Khel
				14 Mullahkhel No 1
				15 Nazar Khel
			Khwazakhela	6 Fatehpur
				7 Barhaapattai
				32 Khadakhel
				33 Parakhel Asril Khel
			Charbagh	16 Gulibagh
				17 Malam Jabba
				18 Charbagh
		III	Kanju	19 Bar Attia Mingolai
				20 Kuz Attia Mingolai
				21 Sahibkhel
			Kabal	22 Shah Dheral
				23 Totano Bandai
				24 Abakhel Kabal
			Barikot	25 Shamozai
				26 Abakhel Barikot
				27 Musakhel Kota
			Mingora	28 Abakhel Qambar
				28' Barath Khel Odigram
				29 Kokarai
				30 Akhune Baalikhel
				31 Faizagar
				(34 Mingora/Saidu Sharif)
	Shangla Par Sub-Div.	IV	Alpuri	9 Bar Gharband
				10 Kuz Gharband
				11 Kuzkana
				12 Berkana
				13 Pirkana
				14 Liloni
				15 Shahpur
		V	Chakesar	4 Bar Pao Chakesar
				5 Kuz Pao Chakesar
			Puran	2 Kathezai
				3 Puran
			Martung	1 Martung
				8 Sahlol Khel
		VI	Besham	6 Dandai
				7 Besham
	Buner Sub-Div.	VII	Daggar	9 Elai
				10 Karapa
				11 Daggar
				12 Torwarsak
			Gadezai	13 Malakkhel
				14 Gadezai
				15 Abakhel Salarzai
			Gagra	6 Norezai
				7 Bajkata
				8 Gagra
			Chagharzai	16 Batara
				17 Gul Bandai
				18 Sorai
				19 Bandir
		VIII	Chamla/ Amazai	2 Amazai
				3 Nawagai
				5 Chamla
		IX	Khudukhel	1 Totalai
				4 Khudukhel

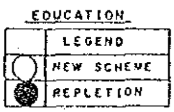
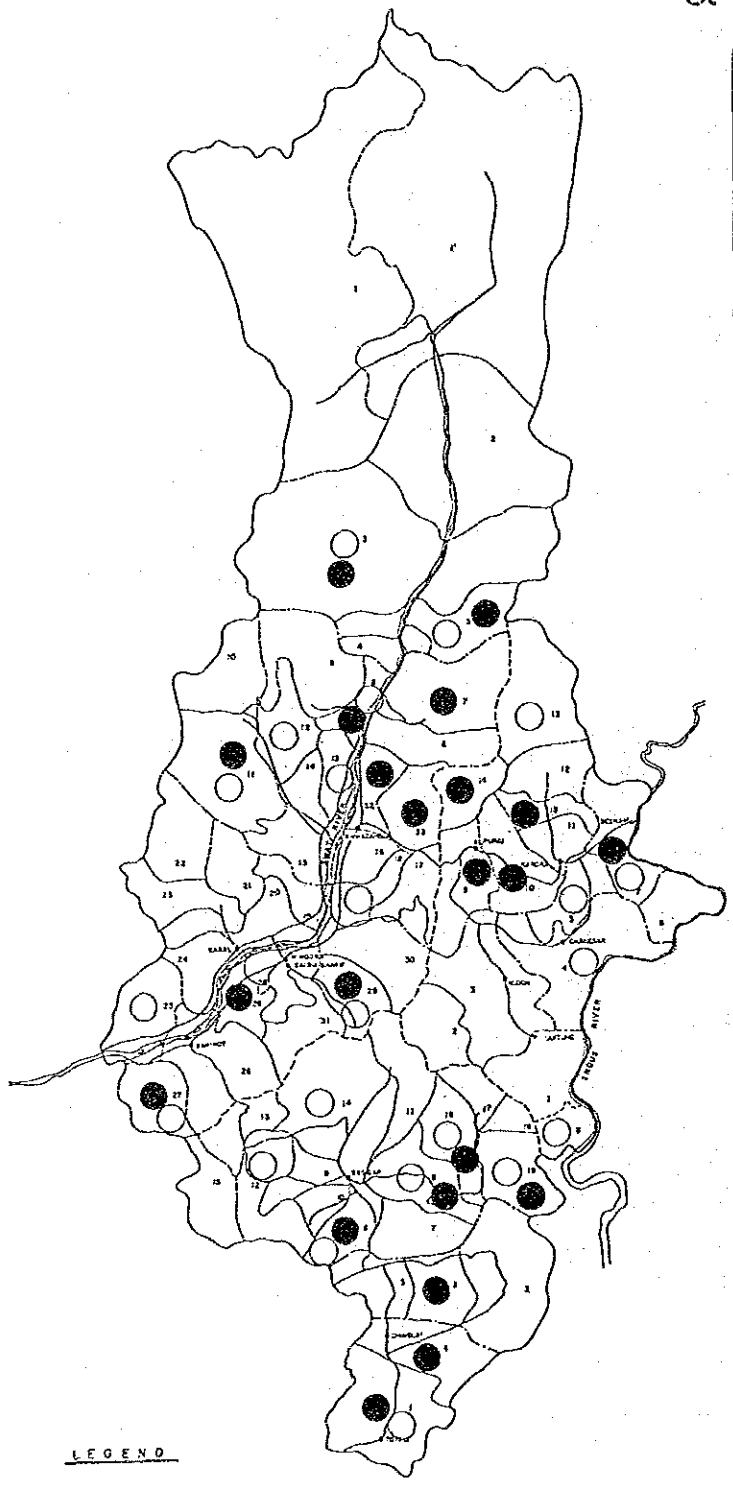


FIGURE H-6 PRIORITY REQUIREMENTS FROM UNION COUNCIL

AGRI. CREDIT & MACHINERY



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 Kurokhel
				10 Sinakhel
				11 Sehlolikhel Matta
				12 Mullakhel No 2
				13 Hassan Khel
				14 Mullakhel No 1
				15 Nasar Khel
			Shawarkhela	6 Fatehpur
				7 Barkanaottai
				32 Khudukhel
				33 Barakhel Marli Khel
			Charbagh	16 Gulibagh
				17 Matan Jabba
				18 Charbagh
		III	Kanju	19 Bar Ittifi Mingolai
				20 Kuz Ittifi Mingolai
				21 Sakibkhel
			Kabal	22 Shah Dherai
				23 Totano Bandai
				24 Akakhel Kabal
			Barikot	25 Shamozai
				26 Akakhel Barikot
				27 Nuakkhel Iota
			Mingola	28 Akakhel Qasbar
				28' Barath Khel Odigram
				29 Kokarai
				30 Akazai Saaikal
				31 Islampur
				(34 Mingola/Saidu Sharif)
	Shangla Par Sub-Div.	IV	Alpuri	9 Bar Ghurband
				10 Kuz Ghurband
				11 Ruskana
				12 Barkana
				13 Pirkana
				14 Lilonai
				15 Shahpur
		V	Chakesar	4 Bar Pan Chakesar
				5 Zar Pan Chakesar
			Puran	2 Bakhorai
				3 Puran
			Kartung	1 Kartung
				6 Sokjal Khel
		VI	Seshan	6 Dandai
				7 Seshan
	Buner Sub-Div.	VII	Daggar	9 Elai
				10 Karapa
				11 Daggar
				12 Torwarsak
			Gadezai	13 Kaleikhel
				14 Gadezai
				15 Akakhel Salarai
			Gagra	6 Morakai
				7 Sajkata
				8 Gagra
			Chagharzai	18 Batara
				17 Gul Bandai
				16 Serai
				19 Kandir
		VIII	Chamla/ Jenzai	2 Inazai
				3 Nawagai
				5 Chamla
		IX	Khudukhel	1 Totalai
				4 Khudukhel

LEGEND

- BOUNDARY OF STUDY AREA
- BOUNDARY OF SUB-DIVISION
- BOUNDARY OF UNION COUNCIL
- RIVERS
- ROAD AND MAIN TOWN

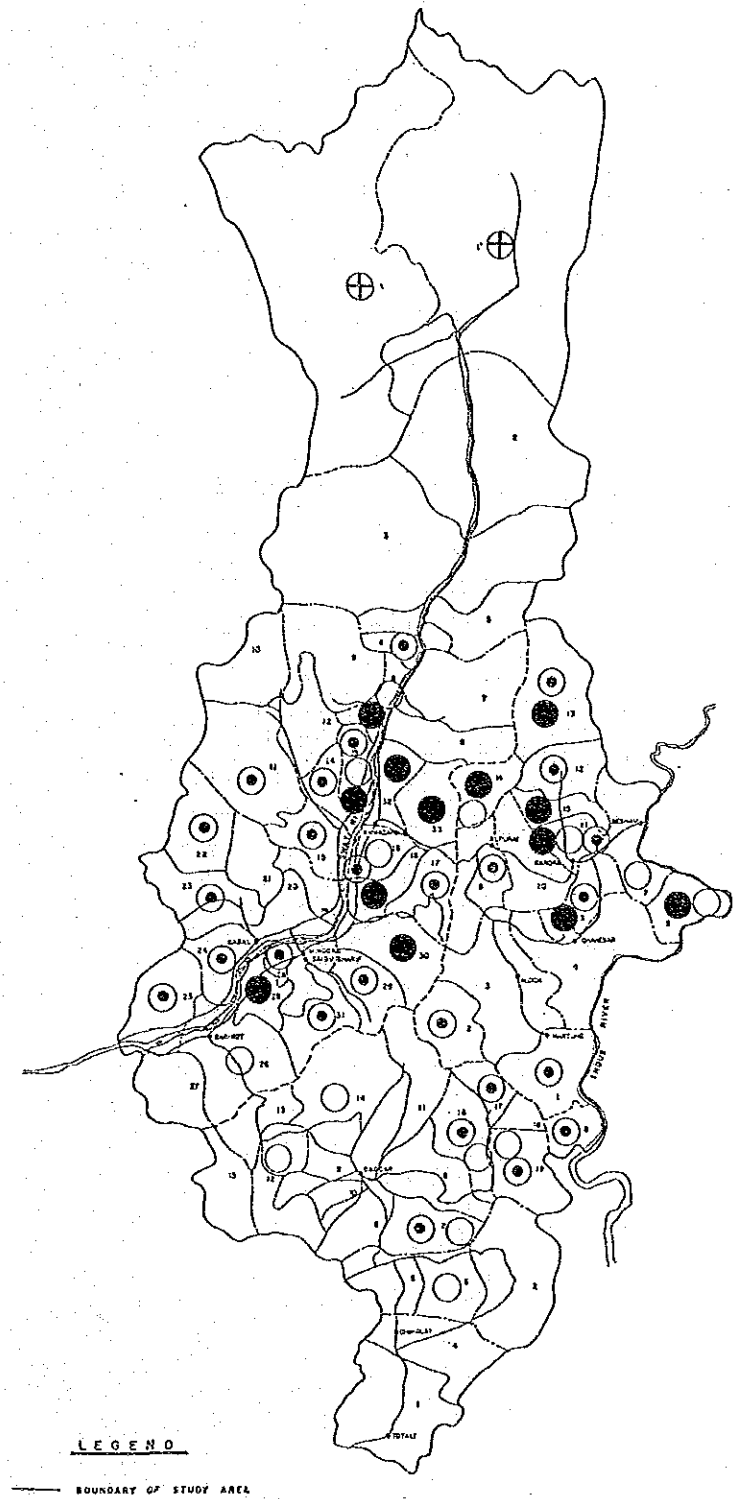
SCALE

AGRI. CREDIT & MACHINERY

	LEGEND
○	CREDIT
●	MACHINERY

FIGURE H-7 PRIORITY REQUIREMENTS FROM UNION COUNCIL

LIVESTOCK



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

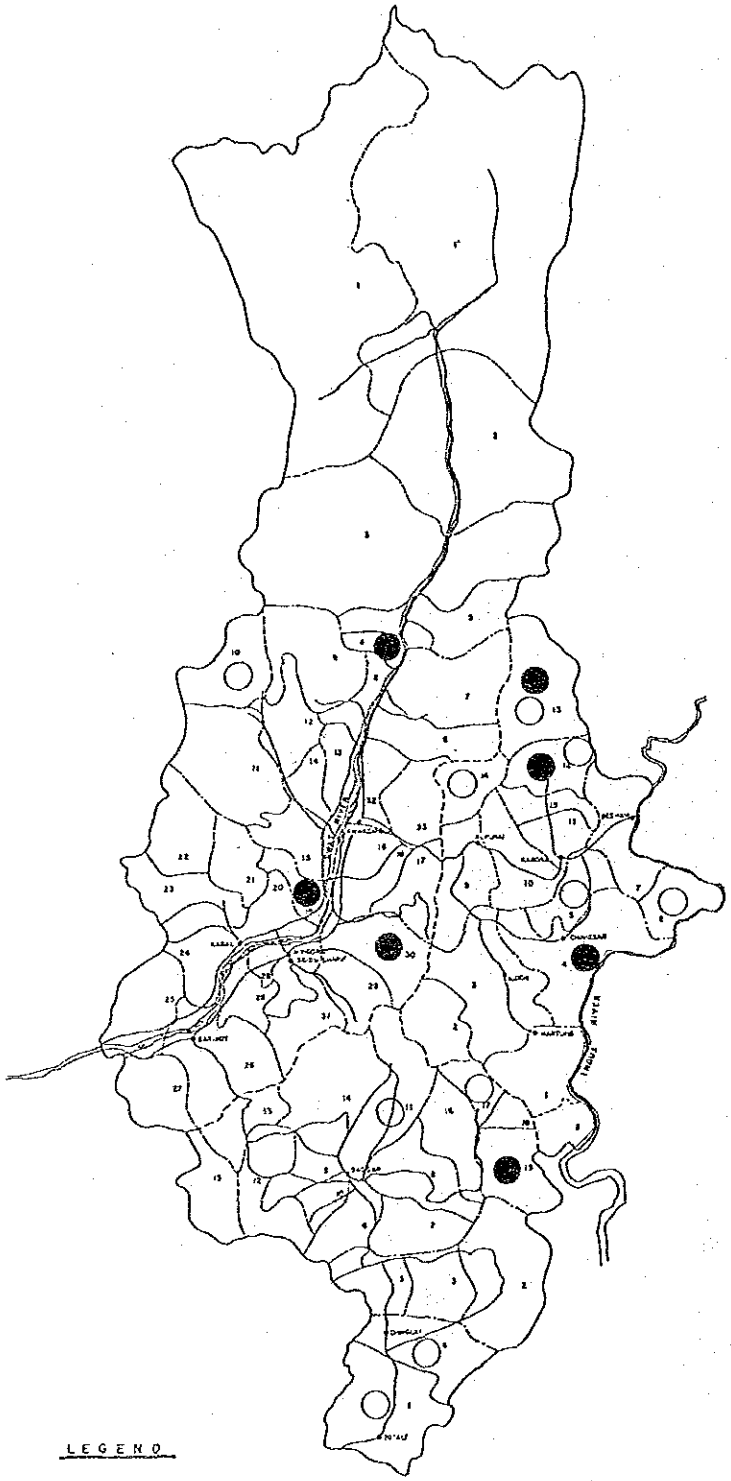
DISTRICT	SUB-DIVISION	ZONE	TEHSIL/ SUB-TEHSIL	UNION COUNCIL
Swat	Swat Sub-Div.	I	Kabal	1 Utror
				1' Kabal
			Babrain	2 Balakot
				3 Bahrain
				4 Madyan
				5 Chail Shahgram
		II	Matta	6 Mohamand Khel
				9 Kuroakhel
				10 Sinakhel
				11 Bahlolkhel Matta
				12 Bullakhel No 2
				13 Hassan Khel
				14 Bullakhel No 1
				15 Nazar Khel
			Jhanzakhela	6 Patahpur
				7 Barkanapatial
				32 Khadukhel
				33 Barakhel Kurli Khel
			Charbagh	16 Gulibagh
				17 Kabaa Jabba
				18 Charbagh
		III	Kanju	19 Bar Ittefa Mingolai
				20 Kuz Ittefa Mingolai
				21 Sahibkhel
			Kabal	22 Shah Kharai
				23 Totano Bandai
				24 Ibakhel Kabal
			Barikot	25 Shamozai
				26 Akakhel Barikot
				27 Kazakhel Kota
			Mingola	28 Ibakhel Ghabar
				29 Barath Khel Odigram
				29 Kaharai
				30 Ikanaro Banikhel
				31 Islampur
				(31 Mingola/Saida Sharif)
	Shangla Par Sub-Div.	IV	Alpuri	8 Bar Gharband
				19 Kuz Gharband
				11 Kuskana
				12 Bajkana
				13 Pirkana
				14 Ulloosi
				15 Shahpur
		V	Chakesar	4 Bar Pan Chakesar
				5 Kuz Pan Chakesar
			Puran	2 Akhorai
				3 Puran
			Karkana	4 Karkana
				8 Bahlol Khel
		VI	Besham	9 Gandai
				7 Besham
	Kuzar Sub-Div.	VII	Dagger	9 Elai
				10 Karapa
				11 Dagger
				12 Terwarsak
			Gadezai	13 Kalaikhel
				14 Gadezai
				15 Ibakhel Salarai
			Gagra	6 Sheezai
				7 Bajkata
				8 Gagra
			Chagharzai	16 Batara
				17 Gul Bandai
				18 Sorai
				19 Bandir
		VIII	Chanla/ Isazai	1 Isazai
				3 Marogai
				5 Chanla
		IX	Khudukhel	1 Totalai
				4 Khudukhel

LIVESTOCK

LEGEND
VETERINARY
POULTRY FARM
CATTLE, BUFFALO
BEEKEEPING

FIGURE H-8 PRIORITY REQUIREMENTS FROM UNION COUNCIL

NURSERY



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 Kalatot
				3 Bahrain
				4 Madyan
				5 Chail Shahgram
		II	Matta	8 Mohamad Khel
				9 Marolkhel
				10 Sinakhel
				11 Bahlolkhel Matta
				12 Mullakhel No I
				13 Hasan Khel
				14 Mullakhel No I
				15 Nasar Khel
			Khwazakhela	6 Fatehpur
				7 Barkanpattai
				12 Khadukhel
				13 Barakhel Kalik Khel
			Chacharh	16 Gulibagh
				17 Kalam Jabba
				18 Charkarh
		III	Kanra	19 Bar Attia Mingolai
				20 Kra Attia Mingolai
				21 Sakibkhel
			Kabal	22 Shah Kheral
				23 Totano Bandai
				24 Khakhel Kabal
			Barikot	25 Shawezai
				26 Khakhel Barikot
				27 Nawakhel Kota
			Mingola	28 Khakhel Qasbar
				29* Barath Khel Odigram
				33 Kuhserai
				30 Khanora Banikhel
				31 Jalsapur
				(34 Mingola/Saidu Sharif)
	Shangla Par Sub-Div.	IV	Alpuri	9 Bar Chorband
				10 Kra Chorband
				11 Kuchana
				12 Barkana
				13 Pirkana
				14 Lilonai
				15 Shahpur
		I	Chakesar	4 Bar Pan Chakesar
				5 Bar Pan Chakesar
			Puran	2 Nahoorai
				3 Puran
			Kartung	1 Kartung
				6 Bahlol Khel
		VI	Besham	6 Gandai
				7 Besham
	Besar Sub-Div.	VII	Gagra	9 Zizi
				10 Karaya
				11 Gagra
				12 Tarwarsak
			Gadezai	13 Kabalibat
				14 Gadezai
				15 Khakhel Salarai
			Gagra	6 Norazai
				7 Rajkata
				8 Gagra
			Chagharzai	16 Matara
				17 Gul Bandai
				18 Sorai
				19 Kandir
		VIII	Charla/ Isazai	2 Jaurai
				3 Mayagai
				5 Charla
		II	Khadukhel	1 Totalai
				4 Khadukhel

LEGEND

- BOUNDARY OF STUDY AREA
- BOUNDARY OF SUB-DIVISION
- BOUNDARY OF UNION COUNCIL
- RIVERS
- ROAD AND MAIN TOWN

SCALE

NURSERY

LEGEND	
○	AFFORESTATION
●	FRUITS

FIGURE H-9 PRIORITY REQUIREMENTS FROM UNION COUNCIL