

パキスタン国農村総合開発計画
実施調査

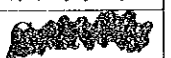
最終報告書

別巻
(情報・資料集)

昭和 61 年 3 月

国際協力事業団

農計技



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実施調査

最終報告書

別巻
(情報・資料集)

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昭和 61 年 3 月

国際協力事業団

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CONTENTS

	<u>Page</u>
Contents	i
I. PHYSICAL CONDITIONS	I-1
I-1 Meteorology and Hydrology	I-3
I-2 Road Transportation	I-14
I-3 Distribution and Conditions of Wells	I-38
II. SOCIOECONOMIC SECTOR	II-1
II-1 Fact Finding Survey in the Study Area - Through Questionnaires and Inquiries	II-4
II-2 Inquiry Survey on Panchayats	II-33
II-3 Present Economic Conditions of Pakistan	II-37
II-4 Water Users Association and Water Right	II-43
II-5 List of Elected/Official Members of Rural Areas Coordination Committee (RACC)	II-45
II-6 Classification of Union Councils and Their Demands	II-47
II-7 Tables and Figures	II-53
II-8 Form of Questionnaire	II-92
III. AGRICULTURAL SECTOR	III-1
III-1 Farm Income from Agricultural Sector	III-4
III-2 Proposed Activities for Livestock Development Promotion	III-28
III-3 Estimated Consumption and Requirements of Vegetables in ICT and Rawalpindi	III-33
III-4 Basic Data	III-35
IV. GROUND WATER EXPLOITATION SURVEY	IV-1
IV-1 Electric Resistivity Surveys	IV-3
IV-2 Occurrence of Unconfined Ground Water	IV-7
IV-3 Hydrogeologic Structure	IV-21

	<u>Page</u>
V. ENGINEERING PLAN AND DESIGN	V-1
V-1 Irrigation Scheme	V-3
V-2 Ground Water Multipurpose Development Scheme	V-11
V-3 Agricultural Machinery Station (AMS) Scheme	V-19
V-4 Small-scale Industry Scheme	V-24
V-5 Power Supply Plan	V-38
V-6 Site Plan of Proposed Facilities	V-41
VI. COST ESTIMATION OF PROPOSED SCHEMES	VI-1
VII. SCOPE OF WORK	VII-1
VIII. PRIORITY CRITERIA OF MIRAD PROJECT COMPONENTS	VIII-1
IX. ACKNOWLEDGEMENT	IX-1
IX-1 List of Direct Participants and Support Personnel of the Master Plan Study	IX-2
IX-2 List of Data Collected	IX-9

I. PHYSICAL CONDITIONS

CONTENTS

		<u>Page</u>
I-1	Meteorology and Hydrology	I-3
I-2	Road Transportation	I-14
I-3	Distribution and Conditions of Wells	I-38

LIST OF TABLES AND FIGURES

TABLE I-1	Monthly Rainfall at Rawalpindi Station	I-4
TABLE I-2	Monthly Rainfall at Murree Station	I-5
TABLE I-3	Mean Daily Temperature at Rawalpindi Station	I-6
TABLE I-4	Mean Daily Relative Humidity at Rawalpindi Station	I-7
TABLE I-5	Mean Daily Sunshine Hours at Rawalpindi Station	I-8
TABLE I-6	Mean Daily Wind Speed at Rawalpindi Station	I-9
TABLE I-7	Rain Fall Analysis of Moving Average Method	I-10
TABLE I-8	Maximum Daily Rainfall	I-11
TABLE I-9	Runoff Coefficient of Kurang River at Rawal Dam Site	I-12
TABLE I-10	Runoff Coefficient of Kurang River at Rawal Dam Site by 5-year Moving Average Method	I-13
TABLE I-11	Major Trunk and Trunk Roads in the Study Area	I-25
TABLE I-12	Existing Road in Each UC	I-26
TABLE I-13	Characteristics of Existing Road Network	I-27
TABLE I-14	Public Transport Fares	I-28
TABLE I-15	Vehicle Flow at the Junction of Lehtrar and National Park Roads	I-29
TABLE I-16	Passengers at the Junction of Lehtrar and National Park Roads	I-30
TABLE I-17 (1)	Number of Motor Vehicles Registered in Pakistan	I-31
TABLE I-17 (2)	Number of Motor Vehicles Registered in Pakistan	I-32
TABLE I-18	Number of Villages with Proposed Metalled Road	I-33
TABLE I-19	Proposed Metalled Road and Structure (Village Link Road)	I-34
TABLE I-20	Characteristics of Road Network in 2001	I-35
TABLE I-21	Village Basic Facts - Distribution and Conditions of Wells	I-39
FIG. I-1	Existing Road Network	I-36
FIG. I-2	Number of Vehicle Flow at Junction of Lehtrar and National Park Roads	I-37

I-1. METEOROLOGY AND HYDROLOGY

TABLE I-1

MONTHLY RAINFALL AT RAWALPINDI STATION

(Unit:mm)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1954	167.00	130.80	39.30	10.80	17.00	12.80	163.20	189.90	128.00	79.80	3.00	11.50	953.10
1955	16.30	1.30	58.70	28.00	35.30	9.40	134.10	265.30	175.90	11.90	0.0	18.60	754.80
1956	34.90	74.40	88.20	14.20	0.0	118.20	261.80	330.00	76.40	18.20	0.0	6.80	1023.10
1957	138.70	34.50	90.60	104.20	60.60	48.60	33.10	247.90	27.10	95.10	53.80	82.70	1016.90
1958	9.20	6.50	95.00	14.20	3.50	12.20	257.20	188.40	131.90	6.60	13.00	115.30	853.00
1959	97.00	89.10	44.70	26.20	74.60	21.90	336.40	242.70	280.90	48.00	91.20	26.20	1378.90
1960	87.20	0.0	90.40	39.20	4.40	7.30	204.00	202.90	79.00	11.20	0.0	37.40	763.00
1961	145.20	43.50	21.10	124.70	12.70	25.70	246.60	154.70	279.80	39.10	43.70	8.70	1145.50
1962	13.70	53.10	68.60	25.80	23.80	52.40	199.00	421.70	78.00	5.10	26.70	82.10	1050.00
1963	0.0	43.00	73.70	57.60	51.60	8.80	220.50	336.10	92.60	0.0	47.30	44.30	975.50
1964	143.30	13.60	20.60	44.10	45.70	24.70	263.70	91.90	47.00	0.0	1.80	12.50	708.90
1965	38.70	92.80	91.00	210.00	115.30	20.60	111.00	119.10	13.50	11.00	25.70	10.70	859.40
1966	0.0	165.30	80.10	52.80	61.10	101.80	164.10	193.60	87.60	39.00	0.0	14.00	959.40
1967	0.0	66.50	134.90	38.80	23.10	18.50	261.70	342.50	57.00	19.80	3.60	152.40	1118.80
1968	69.30	81.60	64.40	36.60	49.70	14.30	249.60	401.50	20.80	36.80	45.70	44.40	1114.70
1969	2.80	62.60	54.40	35.30	55.90	15.00	85.40	274.30	50.20	95.70	6.30	0.0	737.90
1970	72.40	79.50	78.50	12.00	16.30	37.80	189.00	325.20	171.90	24.90	1.00	7.90	1016.40
1971	21.60	56.70	11.20	79.00	26.90	239.00	170.00	369.70	75.70	1.30	12.20	8.20	1091.50
1972	72.60	48.20	108.10	67.70	19.10	51.80	38.90	81.50	113.80	74.20	18.70	73.40	768.00
1973	62.70	80.40	75.70	24.50	52.10	111.20	369.90	403.40	93.50	14.30	3.60	19.30	1310.60
1974	12.90	21.20	35.80	15.90	27.00	99.80	477.90	210.10	56.80	0.0	0.0	32.70	990.10
1975	39.20	59.00	63.60	42.70	33.10	18.00	235.70	391.30	153.60	0.0	0.0	5.80	1042.00
1976	115.90	208.40	117.30	65.00	3.00	33.30	366.90	442.50	202.50	40.10	0.0	1.00	1595.90
1977	72.20	15.20	12.50	54.60	61.00	142.90	617.80	254.40	38.30	19.30	23.30	20.70	1332.60
1978	6.30	32.00	100.10	23.30	14.30	139.80	258.90	496.90	171.70	62.70	70.20	4.10	1380.30
1979	65.20	102.30	147.10	14.10	40.70	28.80	118.50	231.00	109.30	17.30	36.00	22.60	932.90
1980	92.80	93.40	125.80	15.60	23.60	80.00	309.80	189.70	86.20	36.60	14.60	16.00	1084.10
1981	159.80	73.40	176.50	131.60	109.60	19.40	580.20	338.30	131.30	10.00	5.00	0.0	1735.10
1982	74.40	87.30	173.20	191.00	99.20	18.90	159.10	625.20	40.50	25.70	83.00	24.30	1601.80
1983	131.30	51.50	80.70	264.70	26.20	49.40	258.30	582.20	193.00	74.00	2.50	0.0	1713.80
1984	0.0	112.40	75.30	39.60	10.00	202.20	306.20	245.20	131.60	0.00	3.60	16.40	1142.50
MEAN	63.30	67.10	80.60	61.40	38.60	57.60	246.70	296.40	109.50	29.60	20.5	29.50	1101.60

TABLE I-2

MONTHLY RAINFALL AT MURREE STATION

(Unit: mm)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1954	257.81	221.23	154.43	48.26	60.96	56.90	337.31	257.81	241.55	112.52	17.02	6.35	1772.15
1955	35.81	6.86	145.03	54.36	137.92	75.95	408.94	841.25	122.68	44.45	0.0	65.53	1938.78
1956	84.07	35.81	236.22	93.47	1.27	187.71	616.71	442.72	81.79	127.25	1.27	78.99	1987.28
1957	243.33	43.69	213.87	257.81	130.05	72.64	200.41	273.56	78.23	229.62	155.19	84.58	1982.98
1958	29.46	25.91	153.16	66.55	48.01	17.78	322.07	519.18	132.84	68.83	6.60	243.33	1633.72
1959	94.49	161.80	123.95	108.97	172.97	123.44	557.78	254.25	299.72	71.37	104.39	46.23	2119.38
1960	112.01	7.37	183.39	80.77	45.47	36.58	430.78	264.16	120.14	12.45	6.86	48.01	1347.99
1961	151.13	116.33	72.14	269.75	78.74	92.20	307.59	335.53	301.75	97.28	81.79	25.91	1930.14
1962	21.59	105.66	142.24	119.89	83.31	89.41	301.50	249.94	164.34	15.24	48.77	58.42	1400.31
1963	0.0	115.06	234.95	137.67	80.01	81.79	296.93	284.48	180.09	3.05	66.29	44.45	1524.77
1964	255.27	72.14	69.60	155.70	71.37	72.39	401.07	268.73	269.49	0.0	7.37	113.28	1756.41
1965	51.31	207.01	151.13	389.13	208.53	72.39	355.85	286.26	32.51	63.25	43.94	18.03	1879.35
1966	0.25	212.85	166.12	173.74	96.01	118.87	276.86	316.48	209.30	168.40	0.0	47.24	1786.12
1967	5.59	207.26	229.36	181.10	113.79	43.94	277.11	308.86	173.23	55.63	26.67	110.49	1733.03
1968	211.84	126.24	119.63	72.64	97.03	100.58	349.76	332.23	23.88	77.98	35.81	80.26	1627.89
1969	42.93	103.38	113.54	116.84	111.00	55.12	219.96	203.96	100.33	193.29	23.62	0.0	1283.97
1970	120.40	118.87	163.83	51.31	25.40	104.90	263.14	417.32	314.20	48.01	0.0	21.08	1648.46
1971	0.0	147.83	33.02	180.34	35.81	519.43	215.39	275.08	22.86	9.91	24.89	25.15	1489.71
1972	****	****	****	****	****	****	162.81	280.67	223.01	80.26	34.80	125.48	907.03
1973	204.47	139.19	243.59	65.02	100.84	107.95	385.32	388.37	96.01	57.15	1.27	43.69	1832.87
1974	137.92	147.57	22.35	48.51	78.99	228.09	349.50	151.38	68.07	0.76	0.0	191.77	1424.91
1975	62.48	175.01	117.86	112.78	74.68	150.62	398.78	444.50	100.58	0.0	14.99	17.62	1669.90
1976	265.43	344.68	175.51	128.52	55.37	54.61	405.38	459.49	221.49	102.36	0.0	13.72	2226.56
1977	257.05	60.45	15.75	209.04	160.78	200.66	523.49	262.38	221.49	255.02	57.40	65.79	2289.30
1978	275.08	136.14	170.43	63.75	52.58	218.95	565.91	405.64	286.00	10.16	89.66	10.16	2284.46
1979	155.70	108.71	227.08	59.69	122.43	7.87	248.92	310.13	146.81	35.56	103.63	44.20	1570.73
1980	134.62	170.43	212.09	24.13	23.88	318.77	351.03	281.94	146.30	46.99	11.94	47.24	1769.36
1981	240.28	134.87	310.13	134.87	196.60	96.01	456.44	112.78	130.56	40.13	3.56	0.0	1856.23
1982	241.30	150.88	280.42	208.03	128.02	84.33	206.25	337.31	18.54	60.71	82.80	77.47	1876.06
1983	311.15	64.77	179.83	215.65	87.88	61.98	277.62	344.68	81.79	57.40	3.30	8.38	1694.43
MEAN	133.43	122.27	155.36	127.61	89.32	121.65	349.02	330.37	153.65	71.50	35.13	58.76	1748.07

TABLE I-3

MEAN DAILY TEMPERATURE AT RAWALPINDI STATION

(Unit: °C)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1954	8.7	12.2	16.7	22.9	29.8	32.3	30.6	29.8	27.8	20.5	15.6	10.8	21.5
1955	9.7	13.5	18.8	21.8	26.1	33.4	31.2	29.2	26.6	22.3	17.1	12.2	21.8
1956	10.3	13.8	17.0	23.4	32.2	30.6	27.7	27.2	29.2	21.6	15.6	11.4	21.7
1957	10.3	10.8	15.7	19.6	25.0	30.4	32.2	29.1	27.1	22.1	15.9	11.7	20.8
1958	11.5	12.9	17.7	25.3	27.6	32.4	30.5	28.7	27.1	22.9	16.6	12.2	22.1
1959	9.8	10.8	18.3	23.1	28.3	33.3	28.9	29.4	28.2	24.5	15.6	11.2	21.8
1960	9.6	15.7	16.2	20.9	28.5	33.2	30.6	29.7	27.9	23.5	16.0	11.7	22.0
1961	10.3	10.3	17.3	21.5	28.8	32.8	29.9	29.8	28.5	22.3	14.3	9.9	21.3
1962	9.8	12.9	17.5	23.7	28.2	32.4	31.3	29.2	26.6	22.1	15.5	10.8	21.7
1963	10.3	14.9	16.7	22.1	25.9	33.8	32.4	29.1	27.1	24.6	16.8	12.2	22.2
1964	7.5	12.3	18.8	23.6	26.9	31.3	29.5	30.2	27.6	22.8	15.5	11.4	21.5
1965	11.3	11.6	17.0	19.4	25.4	31.3	30.7	28.5	28.1	24.1	17.3	10.1	21.2
1966	11.3	14.7	17.2	21.5	25.4	31.7	30.3	29.5	26.5	22.3	15.6	10.6	21.4
1967	9.7	14.2	16.6	21.7	26.9	32.8	30.8	28.4	28.2	21.7	15.7	11.2	21.5
1968	8.6	10.7	17.6	23.6	26.8	33.1	30.8	28.2	29.4	22.2	15.5	11.2	21.5
1969	9.6	12.2	19.4	21.7	26.0	31.8	31.1	29.2	27.1	22.8	16.7	12.1	21.6
1970	10.1	13.1	16.7	24.8	29.5	31.9	30.2	28.4	26.7	23.5	15.7	11.8	21.9
1971	9.4	12.8	18.4	24.1	28.1	30.1	28.1	28.1	25.5	22.2	16.4	***	22.1
1972	10.6	9.7	17.2	21.1	26.9	31.1	31.4	29.4	26.2	21.8	17.0	11.8	21.2
1973	9.5	13.3	16.6	24.1	29.2	31.7	29.3	30.9	27.3	21.7	16.4	10.9	21.7
1974	9.4	10.7	20.9	25.2	28.1	30.3	29.0	29.1	27.4	21.7	16.3	10.1	21.5
1975	10.3	11.3	16.0	23.1	27.9	30.7	28.9	28.9	28.5	26.7	23.6	15.5	22.6
1976	10.9	11.8	15.9	21.7	28.0	30.6	29.9	26.6	26.7	22.3	16.7	11.3	21.0
1977	9.5	12.7	19.9	23.3	26.3	30.1	28.0	28.3	27.4	23.3	17.9	12.5	21.6
1978	9.3	12.3	15.5	23.7	31.1	32.3	28.1	27.7	27.1	22.7	15.9	12.4	21.5
1979	10.7	12.3	15.1	24.2	25.7	31.1	29.9	28.3	26.1	23.3	17.5	12.5	21.4
1980	10.4	12.5	15.5	24.3	29.8	31.1	29.0	28.7	26.8	23.1	16.9	12.5	21.7
1981	10.3	10.7	16.3	23.3	28.1	30.7	29.3	28.5	26.6	21.7	16.0	11.6	21.1
1982	10.6	10.6	14.4	21.7	25.1	29.9	30.7	28.1	27.1	22.9	16.5	11.5	20.8
1983	10.1	11.9	15.4	19.3	26.1	29.5	29.1	28.8	28.2	21.5	16.9	11.6	20.7
1984	9.8	10.5	19.4	22.5	30.2	32.7	27.8	28.7	23.6	21.8	16.3	11.0	21.2
MEAN	9.9	12.2	17.2	22.7	27.7	31.6	29.9	28.8	27.2	22.7	16.5	11.2	21.5

TABLE I-4

MEAN DAILY RELATIVE HUMIDITY AT RAWALPINDI STATION

(Unit:%)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1954	81.0	85.0	58.0	54.0	48.0	40.0	63.0	69.0	69.0	59.0	57.0	62.0	62.1
1955	62.0	60.0	63.0	39.0	40.0	38.0	51.0	78.0	70.0	61.0	54.0	73.0	57.4
1956	72.0	55.0	75.0	52.0	30.0	51.0	79.0	81.0	64.0	73.0	66.0	68.0	63.8
1957	82.0	72.0	69.0	65.0	52.0	40.0	49.0	73.0	58.0	61.0	77.0	85.0	65.3
1958	78.0	63.0	69.0	47.0	31.0	27.0	68.0	70.0	72.0	60.0	61.0	82.0	60.7
1959	83.0	78.0	65.0	53.0	43.0	38.0	73.0	80.0	83.0	69.0	80.0	77.0	68.5
1960	76.0	63.0	80.0	54.0	36.0	31.0	70.0	78.0	67.0	51.0	50.0	58.0	59.5
1961	72.0	73.0	59.0	58.0	37.0	38.0	71.0	75.0	78.0	64.0	72.0	74.0	64.3
1962	71.0	76.0	66.0	52.0	35.0	35.0	58.0	50.0	70.0	61.0	61.0	71.0	58.8
1963	66.0	63.0	68.0	61.0	46.0	34.0	54.0	73.0	67.0	51.0	71.0	71.0	60.4
1964	81.0	70.0	60.0	53.0	40.0	36.0	65.0	73.0	67.0	46.0	48.0	68.0	58.9
1965	66.0	75.0	62.0	69.0	51.0	36.0	58.0	63.0	54.0	55.0	66.0	61.0	59.7
1966	57.0	68.0	67.0	60.0	37.0	43.0	60.0	73.0	76.0	60.0	58.0	61.0	60.0
1967	61.0	62.0	63.0	53.0	37.0	34.0	67.0	77.0	68.0	59.0	65.0	74.0	60.0
1968	79.0	76.0	66.0	50.0	41.0	32.0	57.0	73.0	61.0	74.0	82.0	65.0	63.0
1969	69.0	71.0	61.0	53.0	43.0	31.0	58.0	73.0	64.0	65.0	70.0	66.0	60.3
1970	65.0	67.0	65.0	41.0	32.0	42.0	61.0	78.0	76.0	66.0	66.0	65.0	60.3
1971	65.0	61.0	53.0	51.0	45.0	65.0	72.0	79.0	69.0	63.0	70.0	74.0	63.9
1972	70.0	67.0	67.0	56.0	40.0	41.0	57.0	65.0	63.0	59.0	65.0	77.0	60.6
1973	73.0	68.0	61.0	49.0	35.0	53.0	75.0	80.0	75.0	68.0	66.0	71.0	64.5
1974	67.0	69.0	56.0	43.0	37.0	42.0	64.0	72.0	63.0	54.0	50.0	75.0	57.7
1975	66.0	68.0	63.0	49.0	38.0	41.0	69.0	78.0	75.0	60.0	58.0	64.0	60.8
1976	70.0	76.0	68.0	57.0	40.0	42.0	70.0	79.0	73.0	67.0	67.0	66.0	64.6
1977	69.0	71.0	49.0	58.0	48.0	50.0	76.0	77.0	74.0	71.0	72.0	73.0	65.7
1978	66.0	68.0	67.0	51.0	30.0	46.0	81.0	82.0	74.0	71.0	74.0	73.0	65.3
1979	74.0	73.0	69.0	58.0	45.0	47.0	70.0	77.0	69.0	66.0	70.0	75.0	66.1
1980	73.0	73.0	74.0	51.0	36.0	49.0	76.0	74.0	71.0	68.0	72.0	75.0	66.0
1981	79.0	76.0	72.0	56.0	53.0	45.0	76.0	81.0	72.0	69.0	71.0	66.0	68.0
1982	72.0	76.0	75.0	62.0	61.0	49.0	57.0	81.0	67.0	71.0	79.0	81.0	69.3
1983	76.0	72.0	70.0	70.0	58.0	49.0	68.0	83.0	75.0	74.0	70.0	70.0	69.6
1984	56.0	57.5	52.0	53.5	33.5	44.5	72.5	52.5	65.5	54.5	64.5	63.5	55.8
MEAN	70.9	69.4	64.9	54.2	41.2	41.6	63.9	74.1	69.3	62.9	66.2	70.5	61.6

TABLE I-5

MEAN DAILY SUNSHINE HOURS AT RAWALPINDI STATION

(Unit:hr)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1954	****	****	****	****	****	****	****	****	****	****	****	****	****
1955	****	****	****	****	****	****	****	****	****	****	****	****	****
1956	****	****	****	****	****	****	****	****	****	****	****	****	****
1957	****	****	6.5	7.0	8.2	11.2	10.4	8.7	9.5	8.5	6.9	5.8	8.4
1958	5.8	8.7	7.1	9.2	8.9	10.6	9.0	9.1	8.3	9.7	8.4	5.4	8.3
1959	6.4	7.1	7.4	9.3	8.8	11.4	8.4	9.2	7.6	8.7	6.8	7.1	8.2
1960	6.9	8.7	5.6	8.4	12.1	11.3	9.1	8.1	9.1	10.1	8.6	7.1	8.8
1961	6.8	7.4	7.5	8.7	10.8	10.3	8.0	9.4	8.4	8.8	7.9	7.3	8.4
1962	6.8	7.4	6.9	8.2	10.7	11.1	9.8	9.0	8.4	9.6	8.6	7.0	8.6
1963	9.0	8.8	5.4	7.4	9.8	11.0	10.0	9.1	9.5	9.7	7.5	8.1	8.8
1964	6.1	6.5	7.1	8.3	10.9	9.8	9.9	9.2	8.2	10.4	9.0	6.9	8.5
1965	5.8	6.0	6.6	6.8	9.5	11.0	****	****	****	8.7	7.7	8.2	7.8
1966	8.4	5.4	6.4	7.3	10.5	9.3	9.3	9.9	7.7	8.8	10.0	7.7	8.4
1967	7.9	5.8	6.7	8.3	11.3	8.9	8.4	8.5	8.1	8.3	6.9	4.4	7.8
1968	4.9	7.1	7.1	9.8	8.8	11.4	8.9	7.9	9.0	8.2	8.1	5.8	8.1
1969	5.9	6.4	8.1	7.4	9.3	10.5	8.5	7.9	8.1	8.2	8.3	7.4	8.0
1970	6.5	7.6	5.8	10.4	10.5	9.6	9.9	8.2	8.0	9.1	9.3	7.6	8.5
1971	6.9	7.0	8.3	8.9	10.0	8.4	7.1	7.7	8.4	9.2	7.9	****	8.2
1972	5.0	7.3	6.3	8.1	9.0	9.8	8.9	8.4	8.8	9.0	8.5	6.3	7.9
1973	6.0	6.0	5.5	8.4	9.2	7.6	7.1	7.1	7.8	9.7	9.1	7.1	7.5
1974	5.8	6.3	6.6	8.4	8.9	8.3	8.3	****	8.3	9.6	8.7	5.0	7.9
1975	****	7.4	7.8	7.9	10.5	10.9	9.4	7.5	8.8	10.4	9.7	6.4	8.8
1976	5.4	****	****	9.1	10.8	11.3	6.6	7.2	8.3	9.1	9.1	6.8	8.4
1977	4.4	9.0	9.5	7.5	10.2	10.5	8.2	8.4	9.2	8.4	7.9	6.4	8.3
1978	6.4	6.9	7.1	9.1	10.7	9.0	6.1	7.1	9.4	9.1	7.2	7.7	8.0
1979	6.4	5.7	6.5	8.5	9.4	11.7	8.0	8.9	9.6	9.6	8.8	5.6	8.2
1980	7.1	6.0	5.6	9.8	11.2	10.4	8.6	9.9	8.4	8.9	8.1	6.6	8.4
1981	5.3	5.8	6.0	9.4	10.6	8.9	7.6	8.4	9.6	9.1	8.1	7.8	8.0
1982	6.3	5.4	8.6	9.5	10.8	10.0	7.5	9.5	8.7	6.5	****	****	8.3
1983	6.3	5.4	5.4	8.6	9.5	10.8	10.0	7.5	9.5	8.7	6.5	4.8	7.7
MEAN	6.3	6.8	6.8	8.5	10.0	10.3	8.6	8.5	8.6	9.0	8.2	6.7	8.2

TABLE I-6

MEAN DAILY WIND SPEED AT RAWALPINDI STATION

(Unit:knots)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1954	4.2	4.2	5.0	6.4	6.3	6.7	5.7	5.3	3.6	3.5	3.2	2.7	4.7
1955	3.3	4.8	6.1	5.9	6.5	5.4	5.8	5.7	3.3	3.5	3.7	2.8	4.7
1956	2.8	4.1	4.7	5.0	5.7	5.2	5.3	3.2	3.3	1.1	2.9	3.3	3.9
1957	4.1	6.0	5.6	7.0	5.4	5.2	5.3	4.5	4.3	4.6	3.6	3.0	4.9
1958	3.1	4.3	5.3	6.4	7.1	5.8	5.8	4.7	4.1	4.0	3.0	2.5	4.7
1959	3.2	4.6	5.0	4.2	6.5	5.8	4.1	4.2	3.3	2.3	2.1	2.4	4.0
1960	2.3	4.0	5.1	6.0	5.6	5.3	6.1	4.9	3.9	3.5	3.9	3.8	4.5
1961	4.5	5.2	5.7	6.2	5.5	5.2	5.1	4.0	3.2	3.5	3.0	2.8	4.5
1962	3.8	3.9	4.6	5.8	6.6	5.1	5.9	4.2	3.7	3.5	4.0	3.1	4.5
1963	2.9	4.3	5.3	5.0	5.9	5.3	6.0	3.2	3.6	2.7	2.9	3.1	4.2
1964	3.1	3.4	4.5	4.7	4.2	4.5	5.1	3.5	3.2	2.5	2.0	3.0	3.6
1965	2.8	3.6	4.4	4.4	4.4	4.0	4.6	3.7	3.5	3.1	2.4	2.5	3.6
1966	2.2	3.4	4.2	4.7	4.3	4.4	3.8	3.2	2.4	1.9	1.9	2.6	3.2
1967	3.2	5.9	5.7	5.8	3.8	5.0	5.3	3.7	3.6	2.0	2.8	3.0	4.1
1968	3.7	3.7	4.0	3.6	4.3	3.9	4.0	3.0	2.2	2.6	2.2	2.5	3.3
1969	2.3	3.2	3.5	3.6	3.7	3.5	3.5	2.7	2.0	2.5	1.7	1.3	2.8
1970	2.0	3.5	4.5	3.9	4.1	4.6	3.9	2.9	2.0	1.9	1.3	2.2	3.1
1971	1.6	3.6	3.0	2.6	2.7	2.6	1.5	1.1	0.6	0.5	****	****	2.0
1972	1.6	2.6	2.8	2.0	2.6	1.6	1.2	1.0	1.3	0.7	0.5	0.8	1.6
1973	1.1	1.7	2.0	1.5	1.5	0.9	0.6	0.5	0.2	0.2	0.2	0.4	0.9
1974	1.0	1.6	1.7	1.8	2.3	2.1	1.8	1.4	0.8	0.3	0.4	0.8	1.3
1975	1.2	1.5	2.4	1.4	1.7	2.0	1.5	1.3	0.7	0.5	0.3	0.8	1.3
1976	0.8	1.5	2.1	1.6	1.5	1.7	1.5	1.1	0.5	0.3	0.1	0.6	1.1
1977	1.2	1.3	1.3	1.1	1.0	1.1	0.9	0.6	0.4	0.3	0.1	0.1	0.8
1978	0.5	1.2	1.3	0.3	0.7	1.1	0.4	0.1	0.2	0.1	0.3	0.2	0.5
1979	0.6	1.0	1.4	1.0	1.1	1.0	1.2	0.5	0.3	0.1	0.1	0.2	0.7
1980	0.9	1.3	1.7	0.5	1.0	1.6	0.8	0.6	0.3	0.5	0.5	0.6	0.9
1981	1.2	1.6	1.9	1.9	1.8	1.4	1.3	0.6	0.4	0.5	0.3	0.4	1.1
1982	1.5	1.4	1.7	1.3	1.1	0.8	1.3	0.6	0.4	0.3	0.4	0.6	0.9
1983	0.9	1.1	1.9	1.6	0.8	1.3	0.8	0.4	0.3	0.2	0.1	0.5	0.8
MEAN	2.3	3.1	3.6	3.6	3.7	3.5	3.3	2.5	2.1	1.8	1.7	1.8	2.7
	1.18	1.59	1.85	1.85	1.90	1.80	1.70	1.29	1.08	0.93	0.87	0.93	1.39 (m/sec)

TABLE I-7 RAIN FALL ANALYSIS OF MOVING AVERAGE METHOD (Unit:mm)

YEAR	5 YEAR MOVING AVERAGE	10 YEAR MOVING AVERAGE
1892.000	812.6	
1893.000	810.8	
1894.000	861.7	
1895.000	867.1	993.8
1896.000	1029.4	969.7
1897.000	1175.0	979.6
1898.000	1128.6	979.2
1899.000	1097.4	975.7
1900.000	1091.4	962.5
1901.000	922.0	923.5
1902.000	750.0	942.5
1903.000	718.4	951.9
1904.000	787.6	945.0
1905.000	812.5	895.9
1906.000	968.1	912.9
1907.000	1041.9	899.5
1908.000	1107.4	903.1
1909.000	1011.5	937.8
1910.000	993.7	997.5
1911.000	907.5	984.2
1912.000	953.1	943.2
1913.000	861.1	995.0
1914.000	874.9	947.9
1915.000	996.3	978.4
1916.000	988.2	946.1
1917.000	1003.7	918.4
1918.000	1031.2	940.5
1919.000	962.0	945.4
1920.000	884.7	890.5
1921.000	902.7	926.4
1922.000	777.2	966.3
1923.000	821.7	894.2
1924.000	970.5	884.2
1925.000	903.7	864.5
1926.000	865.8	913.8
1927.000	951.8	926.6
1928.000	1005.8	901.4
1929.000	882.6	900.5
1930.000	899.2	934.6
1931.000	935.2	948.7
1932.000	917.3	923.1
1933.000	891.6	950.5
1934.000	963.6	987.9
1935.000	1001.7	980.7
1936.000	1040.7	947.9
1937.000	1044.0	944.3
1938.000	1004.3	972.0
		1007.1
1939.000		
1940.000		
1941.000		
1942.000		
1943.000		
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1979.000		

TABLE I-8

MAXIMUM DAILY RAINFALL

Year	Month	Day	Rainfall (mm)
1954	September	10	69.6
1955	September	14	86.4
1956	August	28	76.2
1957	August	13	71.1
1958	September	14	90.7
1959	July	4	140.2
1960	August	18	69.3
1961	September	2	64.8
1962	August	10	90.9
1963	August	17	87.1
1964	July	29	71.6
1965	April	1	84.8
1966	July	26	73.9
1967	August	6	101.9
1968	July	12	87.4
1969	August	12	82.3
1970	August	13	71.9
1971	August	27	125.7
1972	October	17	53.3
1973	July	26	105.9
1974	July	15	133.9
1975	August	23	116.8
1976	September	3	120.0
1977	July	6	133.6
1978	June	30	113.1
1979	September	16	63.8
1980	March	22	60.0
1981	July	14	123.8
1982	August	10	181.3
1983	August	26	173.5

TABLE I-9

RUNOFF COEFFICIENT OF KURANG RIVER AT RAWAL DAM SITE

	Rainfall (mm)			Inflows ($\times 10^6 m^3$)	Outflows ($\times 10^6 m^3$)		Storage ($\times 10^6 m^3$)	Runoff Coefficient (%)
	Rawalpindi	Murree	Mean		canal	spill		
1962/63	1,091	1,261	1,176	49	20	35	-6	15
1963/64	1,017	1,581	1,299	27	22	1	4	8
1964/65	989	2,139	1,564	88	17	57	14	20
1965/66	671	1,521	1,096	47	18	56	-27	16
1966/67	863	1,874	1,369	51	37	0	14	14
1967/68	1,157	1,623	1,390	78	32	47	-1	20
1968/69	1,024	1,488	1,256	64	44	40	-20	19
1969/70	786	1,276	1,031	24	34	0	-10	8
1970/71	953	1,565	1,259	43	34	5	4	12
1971/72	1,212	1,093	1,153	124	41	81	2	39
1972/73	748	1,671	1,210	18	28	0	-10	5
1973/74	1,128	1,617	1,373	72	41	29	3	19
1974/75	1,115	1,381	1,248	35	38	-	3	10
1975/76	1,314	2,096	1,705	60	31	-	28	13
1976/77	1,302	1,960	1,631	141	37	121	-16	31
1977/78	1,293	2,285	1,789	77	37	38	2	16
1978/79	1,574	2,260	1,917	180	36	132	12	34
1979/80	915	1,538	1,227	21	44	0	-21	6
1980/81	1,384	2,221	1,803	105	42	37	26	21
1981/82	1,709	1,848	1,779	86	41	48	-3	18
1982/83	1,531	1,727	1,629	173	40	132	1	39
1983/84	1,397	-	-	132	41	110	-20	-
1984/85	1,089	-	-	152	40	115	-2	-
Average	1,141	1,715	1,428	80	35	47	-1	20

TABLE I-10 RUNOFF COEFFICIENT OF KURANG RIVER
 AT RAWAL DAM SITE
 BY 5-YEAR MOVING AVERAGE METHOD

YEAR	5YEARS MOVING AVERAGE	
	RAINFALL (mm)	Runoff Coefficient(%)
1964	1300.8	14.6
1965	1343.6	15.6
1966	1335.0	17.8
1967	1228.4	15.4
1968	1261.0	14.6
1969	1217.8	19.6
1970	1181.8	16.6
1971	1205.2	16.6
1972	1248.6	17.0
1973	1337.8	17.2
1974	1433.4	15.6
1975	1549.2	17.8
1976	1658.0	20.8
1977	1653.8	20.0
1978	1673.4	21.6
1979	1703.0	19.0
1980	1671.0	23.6

I-2 ROAD TRANSPORTATION

1. General

Roads in Pakistan are classified into the following three types according to surface type;

- i) Metalled Roads : asphalt paved
- ii) Shingle Roads : base course
(surface course to be paved with asphalt)
- iii) Katcha Roads : dirt roads

Roads are also classified according to administrative jurisdiction as follows:

- i) National Roads : Under the National Highway Board, Ministry of Communication. Actual road construction and maintenance are conducted by the Highway Department of Punjab District.
- ii) Provincial Roads : Under the Highway Department of Punjab District
- iii) Capital/City Roads : Under CDA
- iv) Municipal Roads : Under LGRD. Road maintenance is conducted by the Union Council.

2. Existing Road Network

FIG. I-1 Shows existing Road network based on the field survey.

(1) Trunk Roads

Trunk roads in the Study Area are tabulated in TABLE I-11. From the main trunk roads (G-T Road, Islamabad Highway and Murree Road running through the edge of Study Area), the trunk roads (Kahuta, Lehtrar, Simly and National Park Roads) extend eastward at intervals of about 10km. Simly Road is presently under construction by CDA and will be completed in 1986. These roads function as principal farm-to-market roads linking rural with urban areas.

The trunk roads have been improved and represent no obstacle for traffic. However, bridges on the Simly Road extending from Murree Road to Simly Dam, which was built to maintain the drinking water supply pipe into Islamabad, are very narrow and large vehicles must cross the river by causeway instead. During river flooding, the route is impassable.

(2) Feeder Roads (Village Link Road)

Feeder roads connecting trunk roads are still undeveloped in the Study Area. The total length of asphalt paved feeder roads is only 60km and there is no route linking villages in gully eroded areas such as the right bank of the Soan River, the lower reaches of Malal Kas and the middle reaches of Gumreh Kas.

There are 133 villages in the Study Area, out of which only 57 villages or 43% are linked by metalled and shingle roads while 40% of them rely on paths. While the village consists of two or three settlements, there are no roads connecting them.

NUMBER OF VILLAGES CONNECTED BY ROAD

	No. of Village	Percent (%)	Note
Mettalled/Shingle Road	57	43	
Katcha Road	23	17	Mostly impassable by motor vehicle
Path	53	40	- do -
Total	133	100	

(3) Branch Roads

Branch roads or katcha road from trunk and feeder roads are scarce. Katcha roads were developed to transport products by donkey or camel and are not equiped with river crossing facilities such as bridges, culverts, causeways, etc. These roads are eroded at many points with a steep gradient at gully eroded and river crossing points. Forty-six percent (68 km) of the total length (149 km) of katcha road is passable only by tractor. The roads are in very poor condition.

The existing road network in each UC is shown in TABLE I-12 and I-13. Road network conditions in the hilly areas of Bhara Kau, Shah Allah Ditta and Kirpa are not as good as others in the region.

3. Road Utilization

Agricultural products and materials are still transported from farm to village by manual labor, donkey and camel. These means are also utilized to convey goods to trunk roads in hilly and gully eroded areas. Light trucks and wagons drawn by tractors, horses or buffalos are also used for transportation from those villages which have link roads to the market.

As for passenger transportation, light trucks, wagon taxis, mini-bus and buses are utilized with passenger limits as shown below. In the morning and evening, however, all vehicles are overloaded, sometimes to double their designated capacity. These vehicles are mostly managed by private companies.

PASSENGER LIMIT OF VEHICLES

Vehicle	Number Limit (Person)
Light Truck	12
Wagon Taxi	14
Mini-bus	20
Bus	42

Many highway buses utilize the G-T and Murree roads with bus-terminals at Rawat in the southern part of Study Area and at Bhara Kau in the northern part. Inhabitants of certain parts of UC Shah Allah Ditta and UC Tamair are obliged to travel by foot to Islamabad and Rawalpindi which takes more than one hour. Public transport fares range from Rs2 to Rs4 as shown in TABLE I-14, which is expensive for commuter considering the average salary of 800 to 1,000 Rs per month.

4. Vehicle Flow

(1) Vehicle Survey

Vehicles were counted to obtain basic data for planning road alignment and structure. The count was made at the Lehtrar side of the junction of the National Park and Lehtrar Roads. The Lehthrar Road passes through the middle of the Study Area with a total length of 23km. The results of field survey are shown below.

RESULTS OF VEHICLE SURVEY

Hour	7	8	9	10	11	12	13	14	15	16	17	18	19	Total
Cars		132	155	102	119	100	92	84	128	110	157	142	142	1,463
Light Trucks		48	59	45	51	38	34	32	52	47	32	56	44	538
Heavy Trucks		31	17	16	10	18	14	10	20	14	44	16	21	231
Total No. of passengers	2180	1391	911	1137	828	850	793	1176	1186	2266	1470	1154		15,342
Passengers within Study Area	859	658	508	586	437	449	379	596	635	585	801	640		7,132

Remarks: Number of passengers within the Study Area was counted as 70% of bus passengers came from outside the Study Area.

The Sixteen villages were concerned with transportation at the observation point with three UCs in the Study Area and a total population of 35,600 as shown below.

VILLAGES CONCERNED WITH TRANSPORTATION AT THE OBSERVATION POINT

UC	NO. of Villages	Population (1985)
Kirpa	7	10,400
Charah	6	17,400
Tamair	3	7,800
Total	16	35,600

Remarks: Population is estimated by use of the 2.5% growth rate from 1981 Census figure.

The transportation from outside the Study Area is mainly by buses and wagon taxis with passengers from Lehtrar and Koral. In addition, light trucks with combined use for passengers and goods comprised 37% of cars observed. These are also utilized for transporting passengers and goods between the rural area and urban Islamabad and Rawalpindi.

Commuting hours are hour from 7:00 to 8:00 in the morning to 4:00 or 5:00 in the evening. During those hours, the number of passengers double that during the day. People generally travel toward the Lehtrar from the urban area in the morning and Vice versa in the evening, as about one thousand researchers and workers commute to the institution in Charah.

The daily vehicle flow is estimated as shown below using a ratio of daytime to nighttime of 1.2.

DAILY VEHICLE FLOW

Item	Estimated Number
Cars	1,800 Nos/day
Light Trucks	650 Nos/day
Heavy Trucks	280 Nos/day
Total Passengers	18,400 Persons/day
Passengers within the Study Area	8,600 Persons
Large-sized Motor Vehicle Ratio	16% (=280/1,800)
Ratio	11% (=157/1,463)

Remarks: Number of passengers is similarly obtained by 1.2 times the observed number.

Number of passengers between villages and cities is estimated at 4,000 persons per day. This value is 10% of the rural population and the main purposes for travel are for shopping and commuting.

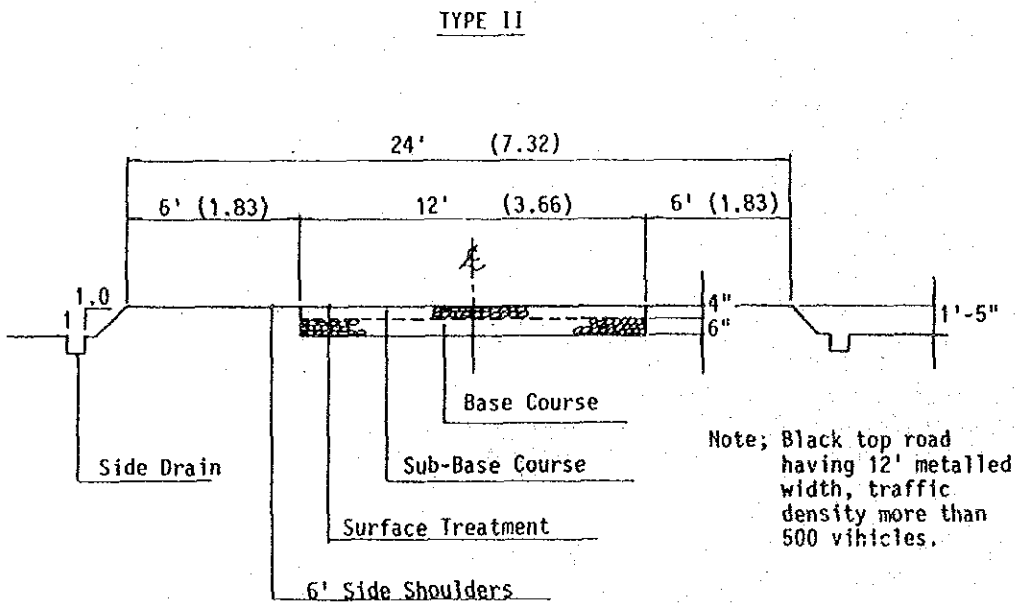
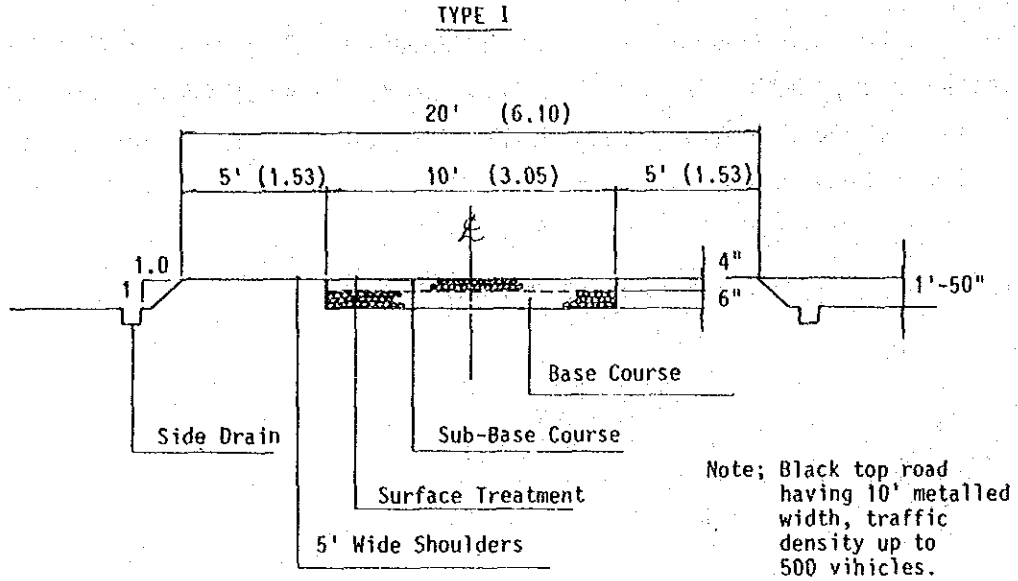
(2) Registered Motor Vehicles

The number of registered motor vehicles in the Study Area as of 1981 is 337 (10,907 in the ICT), out of which motorcycles account for about 34%, motor cars and pickup trucks for 43%, and tractors for 12% (See TABLE I-17).

Average increase in registered vehicles in the ICT is 2,500 per year, with 6.7 per year per 1,000 persons. This is more than the national level of 1.7 and shows rapid development of motorization.

5. Cross Section of Farm-To-Market Road

According to the LGRD, rural roads are basically divided into the following two types of metalled road.

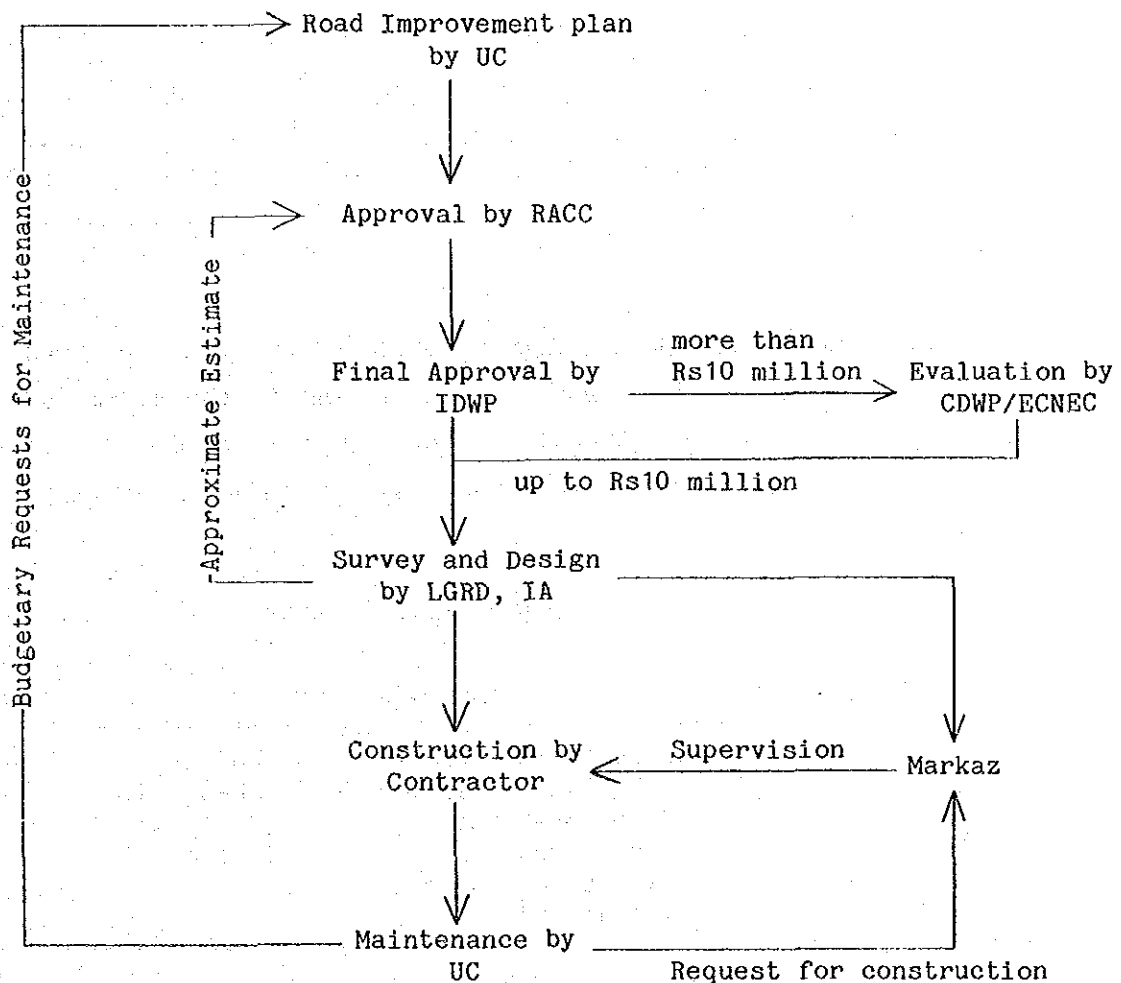


Remarks : () in meter

6. Planning, Construction and Maintenance of Rural Roads

Applications for rural road improvement schemes are prepared at the UC level and submitted to RACC for its approval. The scheme is then submitted to IDWP for their final approval. Field survey and design for rural roads is conducted by LGRD, IA. Road construction is under the supervision of the Markaz concerned while maintenance is entrusted to the UC concerned. A road improvement flow chart from plan to maintenance is presented in the figure below.

FLOW OF RURAL ROAD IMPROVEMNT



Funds for road improvement as of 1981 are tabulated below and show a tendency to increase. Progress on the 240km Rural Road Programme in the Sixth Five Year plan as of June, 1985 was only a total length of 88 km out of which metalled roads totalled 56km, shingle roads 7km and Katcha roads 25km.

FUNDS FOR ROAD IMPROVEMENT PROGRAMME

(Unit: Rs Million)

Item	1980-1981	1981-1982	1982-1983	1983-1984	1984-1985
Metalled Road	1.399	3.931	2.151	3.417	5.090
Shingle road	0.189	0.383	0.206	0.202	-
Katcha road	0.164	0.357	0.073	0.830	-
Structures	0.101	0.139	0.092	0.087	-
Total	1.853	4.810	2.522	4.563	5.090

Source: LGRD, IA

Actual road construction schemes in the study Area are shown below. IA Schemes aim to improve the rural road as a link in the 240km Rural Road Programme Network. On the other hand, the schemes of CDA aim to extend roads in acquired lands for cultivators and to maintain domestic water pipe lines.

ACTUAL ROAD CONSTRUCTION Schemes

Administration	No.	Name of Scheme	Remarks
IA	1	Pahg Ranwal Pandori Road (Phase I)	7.5km
	2	Pahg Panwal Pandori Road (Phase II)	-
	3	Shah Darah Road (Phase I)	4.0km
	4	Shah Darah Road (Phase II)	-
	5	Pir Sohawa Jagiot	10.0km
	6	Talhar Rad	
CDA	1	Tarlai Area 1st Scheme	4.0km
	2	Sohan Area 2nd Scheme	12.8km
	3	Sihala Area 3rd Scheme	2.0km
	4	Simly Road	5.4km

Note: CDA, schemes No. 1 to No. 3 are under the Road Division while No. 4 is under the Simly Dam Division.

7. Number of Villages with Proposed Metalled Road

There are 133 villages in the Study Area. Excluding those villages with settlements outside the Study Area, the village with proposed metalled roads total 108 as tabulated in TABLE I-18.

TABLE I-11 MAJOR TRUNK AND TRUNK ROADS IN THE STUDY AREA

Name of Trunk Road	Jurisdiction-	Road ^{1/} length (km)	Road Width		Connecting UC	Note
			Carriage Way (m)	Traveled Way (m)		
Grand Trunk Road	MC ^{2/}	12.0	13.7	7.6	Rawat	Major trunk road in Pakistan, G.T. Road connecting Lahore, Rawalpindi and Peshawar
Shahrah-i-Islamabad Highway	CDA ^{3/}	19.3	24.4 11.0	14.6 7.3	Rawat Sihala Koral Tarlai	Islamabad Highway along the eastern boundary of Rawalpindi
Murree Road	HD ^{4/}	8.6	10.4	6.1	Bahara Kau Phulgran	Extending north, linking Rawalpindi and Murree
National Park Road	CDA	6.2	10.4	7.3	Sohan	Linking Lehtral and Murree Roads
Kahuta Road	HD	15.6	8.0 7.3	5.5	Rawat Sihala	Extending northeast along the Soan River
Lehtrar Road	HD	25.3	9.7 8.0	5.5	Tarlai Kirpa Charah	The Atomic Road extending east from Islamabad Highway Road
Simly Road	CDA	19.7	7.9	5.5	Bhara Kau Phulgran Tamair	Extending from Murree Road to Simly Dam to maintain the drinking water pipeline (under construction)

Remarks: ^{1/}; road length measured in the Study Area
^{2/}; Ministry of Communication
^{3/}; Capital Development Authority
^{4/}; Highway Department, Punjab Gov.

EXISTING ROADS IN EACH UC

TABLE I-12

Markaz	(Unit: km)										Total
	Sihara	Bhara Kau	Tarlai	Bhara Kau		Tarlai		Tarlai		Total	
Union Council	Koral Rawat	Sihala	Bhara Kau	Phulgran	Shah All. Ditta	Kirpa Kalan	Sohan Tamair	Charah	Charah		
MC1/ Metalled	-	12.0	-	-	-	-	-	-	-	-	12.0
HD2/ Metalled	-	7.5	11.5	3.5	5.1	-	6.0	5.5	-	10.2	70.7
Metalled	5.0	2.3	5.0	-	7.4	13.6	-	8.4	32.5	12.3	86.5
Metalled	-	-	-	-	2.0	-	-	-	-	-	2.0
CDA3/ Katcha (passable by Suzuki)	-	-	-	9.8	-	-	-	-	11.5	2.7	24.0
Metalled	4.8	5.9	12.1	3.5	3.5	0.3	8.3	5.4	8.6	2.7	60.2
Shingle	-	1.1	-	-	1.6	-	5.4	-	-	-	8.1
Katcha (passable by Suzuki)	2.0	5.0	2.4	3.1	11.0	1.0	8.7	4.0	1.8	10.5	56.2
Katcha	0.6	12.6	7.3	4.4	5.2	2.0	12.0	6.2	1.9	5.4	68.3
Metalled	9.8	27.7	28.6	7.0	16.0	13.9	14.3	19.3	4.1	25.2	229.4
Shingle	-	1.1	-	-	3.6	-	5.4	-	-	-	10.1
Katcha	2.6	17.6	9.7	17.3	16.2	3.0	20.7	10.2	15.2	18.6	148.5

Remarks: 1/; Ministry of Communication (National Road)
 2/; Highway Department of Punjab Gov. (Provincial Road)
 3/; Capital Development Authority (Capital/City Road)
 4/; Local Government and Rural Development, IA (Municipal Road)

CHARACTERISTICS OF EXISTING ROAD NETWORK

TABLE I-13

Union Council	Sihara			Bhara Kau			Tarlai			Total/ Average		
	Koral	Rawat	Sihala	Bhara Kau	Phulgran	Shah All. Ditta	Kirpa	Tarlai Kalan	Sohan		Tamair	Charah
(1) Total Road Length (km)	12.4	46.4	38.3	24.3	35.8	16.9	40.4	29.5	56.3	43.8	43.9	388.0
(2) Metalled Road (km)	9.8	27.7	28.6	7.0	16.0	13.9	14.3	19.3	41.1	25.2	26.5	229.4
(3) Shingle & Katcha Road (km)	2.0	6.1	2.4	12.9	14.6	1.0	14.1	4.0	13.3	13.2	6.7	90.3
(4) Katcha Road ^{1/} (km)	0.6	12.6	7.3	4.4	5.2	2.0	12.0	6.2	1.9	5.4	10.7	68.3
(5) Total Area (km ²)	19.0	48.6	49.8	59.8	48.7	85.2	66.9	24.8	30.7	103.7	57.8	595.0
(6) 1985 Estimate ^{2/} Total Population	5,000	12,600	17,700	11,700	12,400	84,00	21,500	13,600	14,500	15,100	19,700	152,200
(1)/(5) (km/km ²)	0.65	0.95	0.77	(0.41)	0.74	(0.20)	(0.60)	1.19	1.83	(0.42)	0.76	0.65
(2)/(5) (km/km ²)	0.52	0.57	0.57	(0.12)	(0.33)	(0.16)	(0.21)	0.78	1.34	(0.24)	0.46	0.39
(1)/(6) (m/population)	(2.48)	3.68	(2.16)	(2.08)	2.89	(2.01)	(1.88)	(2.17)	3.88	2.90	4.53	2.55
(2)/(6) (m/population)	1.96	2.20	1.62	(0.60)	(1.29)	1.65	(0.67)	(1.42)	2.83	1.67	(1.35)	1.51

Remarks: 1/ ; Non-passable by truck
2/ ; Rural population growth rate is estimated at 2.5%.
3' ; () less than average

TABLE I-14

PUBLIC TRANSPORT FARES

Location		Destination	Fare (Rs)	Remarks
UC	Village			
Rawat	Rawat	Rawalpindi	2.5	Bus, Suzuki more than 100 times
	Shaikh Pur	Rawat	2.0	Suzuki, 3 round Trips
Sihala	Sihala	Rawalpindi	1.5	Railway, To Rawalpindi, 5 times from Rawalpindi, 6 times
Kirpa	Kirpa	Rawalpindi	4.0	Suzuki, 10 round trips
	Gojra	Sihala	2.0	Suzuki, 6 round trips
Charah	Charah	Rawalpindi	3.0	Bus, more than 30 times
	Jagiot	Rawalpindi	3.0	Bus, 2 round trips Suzuki, 4 -"-
Tamair	Jand Garan	Bhara Kau	3.0	To Simly Road 1hr. on foot Bus, every hour
	Simly	Rawalpindi	3.0	Bus, 20 round trips
Phulgran	Phulgran	Bhara Kau	2.0	2 round trips
	Dohala	Bhara Kau	2.0	Bus, Suzuki, more than 10 times (every hour)
Bhara Kau	Kuri	Rawalpindi	2.5	Suzuki, 20-30 round trips
	Bhara Kau	Islamabad	2.0	More than 20 times (Murree Road)
Shar Allah Ditta	Shah Allah Ditta	Islamabad	4.0	Mini-Bus, 2 round trips Suzuki, 4 round trips
	Gokina	Islamabad	4.0	To bus-stop 40 min. on foot Jeep, Suzuki, 10 round trips
	Shah Darah	Islamabad	4.0	Suzuki, 4 round trips

TABLE I-15 VEHICLE FLOW AT THE JUNCTION OF LEHTRAR AND NATIONAL PARK ROADS

	(Unit: Number)															Total	Remarks
	7	8	9	10	11	12	13	14	15	16	17	18	19				
(1) Motorcycles	28	49	24	24	14	24	24	22	27	29	36	35	336				
(2) Cars	7	16	13	13	12	9	6	12	15	16	21	23	163				
(3) Wagon Taxis	10	39	14	18	14	17	20	16	12	38	23	29	250				
(4) Passenger Truck ^{1/}	36	48	35	35	27	31	22	28	30	22	44	32	390				
(5) Taxi	10	9	2	8	5	5	3	7	5	7	8	11	80				
(6) Buses	23	13	10	17	11	12	10	16	15	18	14	11	170				
(7) Light Commercials	12	11	10	16	11	3	10	24	17	10	12	12	148				
(8) Heavy Commercials	7	11	15	9	16	13	9	15	12	16	14	16	153				
(9) Heavy Buses	24	6	1	1	2	1	1	5	2	28	2	5	78				
(10) Tractors	3	2	2	2	2	1	3	5	2	2	4	3	31				
(11) Pedal Cycles	69	30	13	12	12	11	13	26	57	56	80	29	408				
(12) Animal-Drawn	6	1	1	-	1	3	-	-	3	2	-	-	17				
(13) Total Vehicle	132	155	102	119	100	92	84	128	110	157	142	142	1,463	(2)-(10)			
(14) Total Vehicle	160	204	126	143	114	116	108	150	137	186	178	177	1,799	(1)-(10)			
(15) Total Vehicle	235	235	140	155	127	130	121	176	197	244	258	206	2,224	(1)-(12)			

Remarks: Vehicle flow was observed at the Lehtrar side of junction, 9th Sep. 1985.
^{1/}; Suzuki Truck

TABLE I-16

PASSENGERS AT THE JUNCTION OF LEHTRAR AND NATIONAL PARK ROADS

(Unit: Number)

Time	7	8	9	10	11	12	13	14	15	16	17	18	19	Total	Remarks
(1) Motorcycles	51	71	37	38	21	37	34	33	42	42	42	50	46	502	
(2) Cars	18	28	29	36	30	21	7	35	49	56	56	64	58	441	
(3) Wagon Taxis	154	263	101	113	122	88	132	129	112	274	189	213	213	1,990	
(4) Passenger Truck ^{1/}	320	294	235	250	164	203	154	228	238	162	309	271	271	2,828	
(5) Taxi	29	17	5	11	11	14	7	20	13	20	20	22	39	208	
(6) Buses	907	470	375	619	380	405	360	520	498	517	600	600	345	5,996	
(7) Light Commercials	34	33	28	28	21	7	17	50	34	30	35	35	35	352	
(8) Heavy Commercials	18	19	34	20	34	25	18	30	37	48	45	45	48	376	
(9) Heavy Buses	532	141	40	5	3	30	30	88	90	945	60	60	60	2,024	
(10) Tractors	8	6	4	5	4	2	9	12	3	4	4	11	8	76	
(11) Pedal Cycles	74	30	13	12	15	11	14	27	60	58	81	81	31	426	
(12) Animal-Drawn	15	2	2	-	12	6	-	-	3	4	4	-	-	44	
(13) Pedestrians	20	17	8	-	11	1	1	4	7	6	6	4	-	79	
(14) Total Passengers	587	517	395	400	323	327	271	439	486	430	621	536	536	5,332	Except (3), (6), (9)
(15) Total Passengers	2,180	1,391	911	1,137	828	850	793	1,176	1,186	2,266	1,470	1,470	1,154	15,342	(1)-(13)

Remarks: Numbes of passenger were observed at the Lehtrar side of junction, 9th Sep. 1985.

^{1/}; Suzuki Truck

TABLE I-17 (1) NUMBER OF MOTOR VEHICLES REGISTERED
IN PAKISTAN

Year	Registered ^{1/} Vehicles (x100 nos)	Population ^{2/} (x1,000 persons)	Number of Vehicles per 1,000 persons
1972 (Census figure)	-	65,309	-
1973 (1st, July)	458	66,879	6.85
1974 (1st, July)	509	68,924	7.38
1975 (1st, July)	576	71,033	8.11
1976 (1st, July)	656	73,205	8.96
1977 (1st, July)	716	75,444	9.49
1978 (1st, July)	837	77,752	10.76
1979 (1st, July)	1,014	80,130	12.65
1980 (1st, July)	1,110	82,581	13.44
1981 (Census figure)	1,191	84,254	14.14
1982 (1st, July)	1,338	87,758	15.25
1983 (1st July)	-	90,480	(16.3) ^{3/}
1984 (1st July)	-	93,286	(17.4) ^{3/}

Remarks: 1/, 2/ ; "Pakistan Statistical Yearbook 1985"
Federal Bureau of Statistics, Statistics
Division Government of Pakistan

3/ ; Numbers were estimated by Simple linear
regression.

TABLE I-17 (2) NUMBER OF MOTOR VEHICLES REGISTERED IN PAKISTAN

Year	Motor Cars, Jeeps & Station Wagons	Motor Cabs/ Taxis	Buses	Trucks	Motor- Cycles 2 Wheels	Motor Cycles 3 Wheels	Others	Total
	1973	1,62,022	15,324	29,718	49,345	1,52,500	22,555	26,352
<u>1974</u>	<u>1,73,042</u>	<u>16,127</u>	<u>33,477</u>	<u>53,467</u>	<u>1,74,597</u>	<u>25,117</u>	<u>33,065</u>	<u>5,08,892</u>
1975	1,86,632	17,093	36,370	58,197	2,06,891	27,088	43,287	5,75,558
1976	2,03,451	18,113	38,991	61,864	2,47,314	29,129	57,542	6,56,404
1977	2,08,844	18,418	41,650	56,898	2,85,578	31,678	75,972	7,16,038
1978	2,42,134	20,773	43,408	59,847	3,40,487	34,774	95,264	8,36,687
1979	2,80,076	23,156	47,482	65,304	4,28,547	40,476	1,29,290	10,14,331
1980	2,64,028	18,951	49,851	58,000	5,08,025	45,906	1,65,137	11,09,898
1981	2,82,519	19,595	51,183	59,562	5,49,098	45,349	1,83,796	11,91,102
1982	3,04,449	20,715	51,710	72,013	6,35,196	45,525	2,08,354	13,37,962
1983

Source: "Pakistan Statistical Yearbook 1985" Federal Bureau of Statistics Division
Government of Pakistan

TABLE I-18 NUMBER OF THE VILLAGES WITH PROPOSED METALLED ROADS

Union Concil	Total Village	Studied Villages	Existing Road Condition			Proposed Metalled Roads	Metalled Road Condition in 2001
			Metalled Shingle	Katcha	Path		
Koral	8	7	(75) 6	(12.5) 1	(12.5) 1	1	7
Rawat	14	7	(29) 4	(21) 3	(50) 7	3	7
Sihala	14	12	(57) 8	(0) 0	(43) 6	4	12
Bhara Kau	6	6	(17) 1	(33) 2	(50) 3	5	6
Phulgran	16	10	(44) 7	(12) 2	(44) 7	4	10
Shan Allah Ditta	5	5	(0) 0	(40) 2	(60) 3	4	4
Tarlai	10	10	(40) 4	(30) 3	(30) 3	6	10
Sohan	13	13	(92) 12	(8) 1	(0) 0	1	13
Kirpa	23	23	(43) 10	(22) 5	(35) 8	13	23
Tamair	16	8	(38) 3	(13) 2	(69) 11	5	8
Charah	8	8	(25) 2	(25) 23	(50) 4	6	8
Total	133	109	(40) 57	(17) 23	(40) 53	52	108

Remarks: () %

TABLE I-19 PROPOSED METALLED ROAD AND STRUCTURE (VILLAGE LINK ROAD)

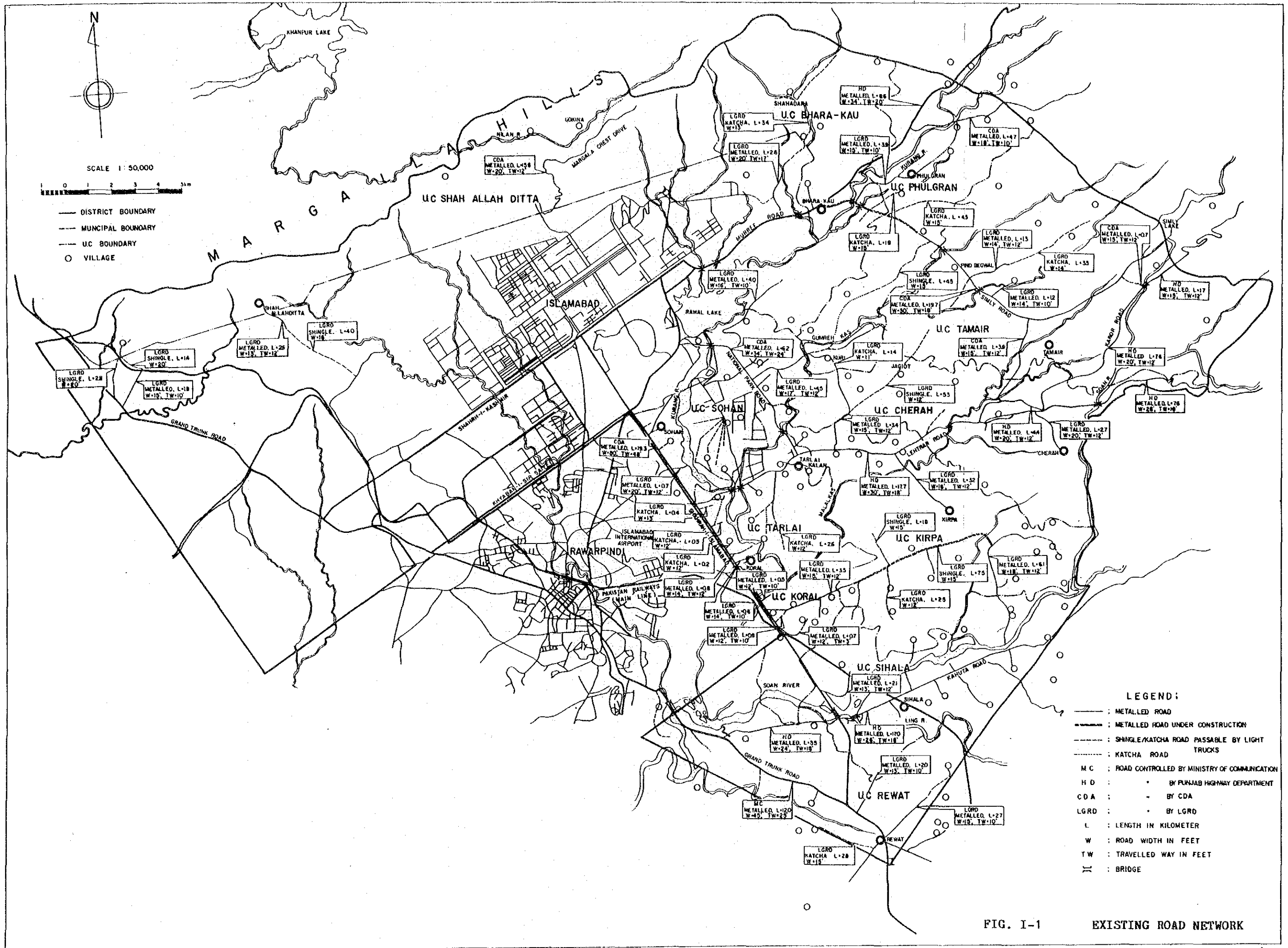
Markaz	Sihara			Bhara kau			Tarlai					Total
	Koral	Rawat	Sihara	Bhara kau	Phulgran	Shah All-Ditta	Kirpa	Tarlai Kalan	Sohan	Tamair	Cherah	
Union Council	4.6	6.5	9.2	17.5	5.1	1.8	29.8	6.9	-	19.9	17.7	119.0
Road Construction (km)												
Road Improvement (km)	1.6	6.3	2.1	8.0	15.9	4.6	16.2	5.8	5.6	8.5	6.4	81.0
Sub-total Road (km)	6.2	12.8	11.3	25.5	21.0	6.4	46.0	12.7	5.6	28.4	24.1	200.0
Structure												
Bridge (nos)	1	-	-	-	-	-	2	-	-	-	1	4
Causeway (nos)	2	4	8	11	6	2	9	2	1	12	6	63
Curvert (nos)	4	8	16	20	10	5	20	5	2	20	12	122
Retaining Wall (m)	80	160	320	400	200	100	400	100	40	400	240	2,440
Drain (km)	6	13	11	26	21	6	46	13	6	28	24	200
Afforestation (nos)	1,200	2,600	2,200	5,200	4,200	1,200	9,200	2,600	1,200	5,600	4,800	40,000
Existing Katcha Road (km)	1.0	12.4	7.6	9.3	3.9	1.4	9.9	4.4	9.6	10.1	11.0	80.6
EXISTING Metalled Road (km)	9.8	27.7	28.6	7.0	16.0	13.9	14.3	19.3	41.1	25.2	26.5	229.4
Metalled Road of CDA Programme (km)	-	-	2.0	3.4	2.0	-	-	4.0	12.8	-	-	24.2
Metalled Road of LGRD Programme (km)	-	-	-	(4.0)	-	-	(7.5)	-	-	-	(10.0)	(21.5)
Total Metalled Road (km)	16.0	40.5	41.9	35.9	39.0	20.3	60.3	36.0	59.5	53.6	50.6	453.6
Total Road (km)	17.0	52.9	49.5	45.2	42.9	21.7	70.2	40.4	69.1	63.7	61.6	534.2

Remarks : () is included in road length of construction/improvement.

TABLE I-20 CHARACTERISTICS OF ROAD NETWORK IN 2001

Markaz	Sihala			Bhara Kau			Tarlai					Total/ Average
	Koral	Rawat	Sihala	Bhara Kau	Phulgrau	Shah Ait Ditta	Kirpa	Tarlai Kalan	Sohan	Tamair	Charah	
(1) Total Road (km)	17.0	52.9	49.5	45.2	42.9	21.7	70.2	40.4	69.1	63.7	61.6	534.2
(2) Total Metalled Road (km)	16.0	40.5	41.9	35.9	39.0	20.3	60.3	36.0	59.5	53.6	50.6	453.6
(3) Proposed Road (km)	6.2	12.8	11.3	25.5	21.0	6.4	46.0	12.7	5.6	28.4	24.1	200.0
(4) Total Area (km ²)	19.0	48.6	49.8	59.8	48.7	85.2	66.9	24.8	30.7	103.7	57.8	595.0
(5) 2001 Estimate Total Population	7,500	18,800	26,300	17,400	18,400	12,400	31,900	20,100	21,600	22,300	29,200	225,900
(1)/(4) (km/km ²)	0.89	1.09	0.99	0.76	0.88	0.25	1.05	1.63	2.25	0.61	1.07	0.90
(2)/(4) (km/km ²)	0.84	0.83	0.84	0.60	0.80	0.24	0.90	1.45	1.94	0.52	0.88	0.76
(3)/(4) (km/km ²)	0.33	0.26	0.23	0.43	0.43	0.08	0.69	0.51	0.18	0.27	0.42	0.34
(1)/(5) (m/population)	2.27	2.81	1.88	2.60	2.33	1.75	2.20	2.01	3.20	2.86	2.11	2.36
(2)/(5) (m/population)	2.13	2.15	1.59	2.06	2.12	1.64	1.89	1.79	2.75	2.40	1.73	2.01
(3)/(5) (m/population)	0.83	0.68	0.43	1.47	1.14	0.52	1.44	0.63	0.26	1.27	0.83	0.88

Remarks : /1 ; Rural population growth rate is estimated at 2.5 %.



SCALE 1:50,000



- DISTRICT BOUNDARY
- - - MUNICIPAL BOUNDARY
- - - UC BOUNDARY
- VILLAGE

- LEGEND:**
- : METALLED ROAD
 - - - : METALLED ROAD UNDER CONSTRUCTION
 - . - . : SHINGLE/KATCHA ROAD PASSABLE BY LIGHT TRUCKS
 - - - : KATCHA ROAD
 - M C : ROAD CONTROLLED BY MINISTRY OF COMMUNICATION
 - H D : " BY PUNJAB HIGHWAY DEPARTMENT
 - C D A : " BY C D A
 - L G R D : " BY L G R D
 - L : LENGTH IN KILOMETER
 - W : ROAD WIDTH IN FEET
 - T W : TRAVELLED WAY IN FEET
 - || : BRIDGE

FIG. I-1 EXISTING ROAD NETWORK

FIG. I-2 NUMBER OF VEHICLE FLOW AT JUNCTION OF LEHTRAR AND NATIONAL PARK ROADS

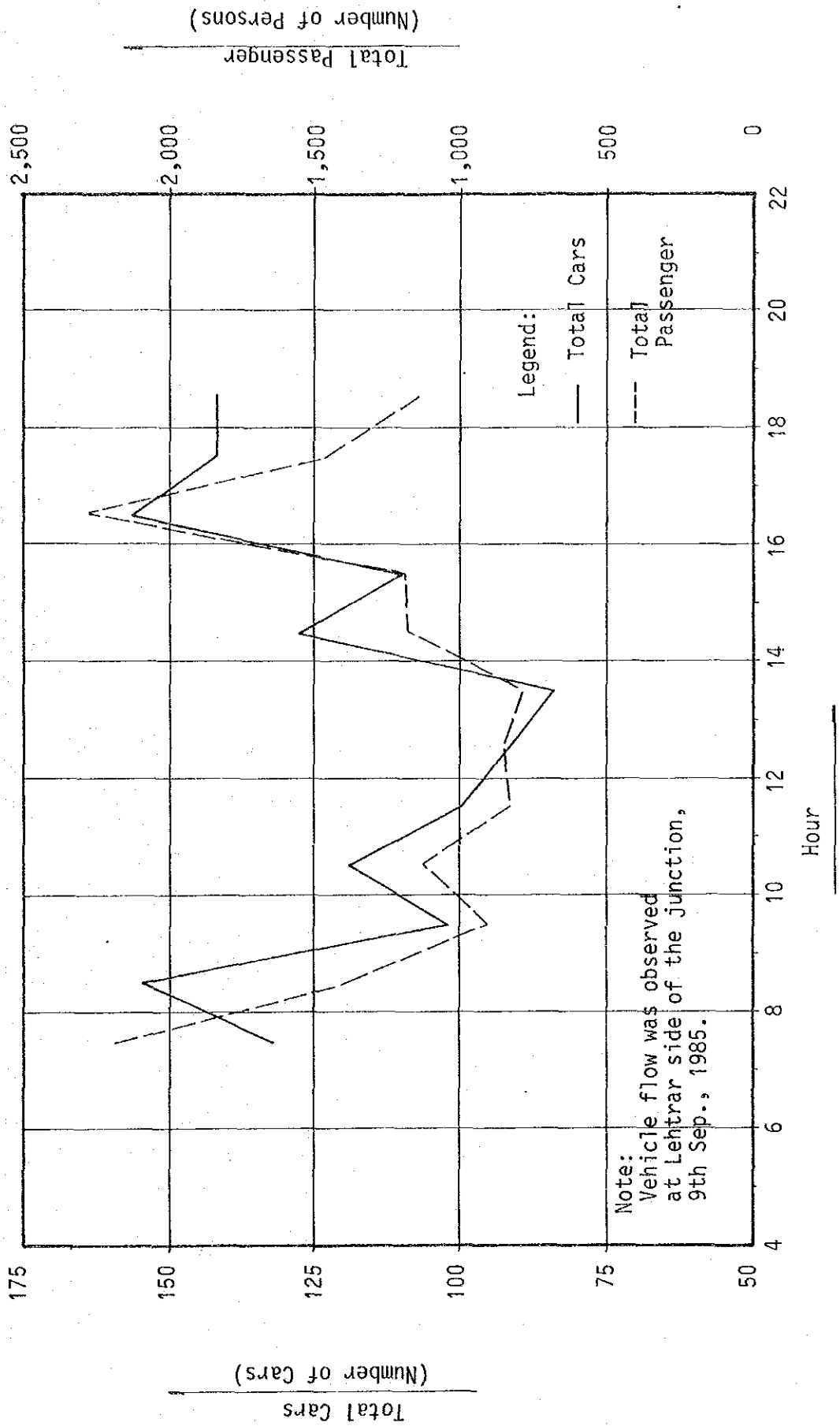


FIG. I-2 NUMBER OF VEHICLE FLOW AT JUNCTION OF LEHTRAR AND NATIONAL PARK ROADS

I-3. DISTRIBUTION AND CONDITIONS OF WELLS

TABLE I-21 VILLAGE BASIC FACTS - DISTRIBUTION AND CONDITIONS OF WELLS

UNION COUNCIL	VILLAGE	POPULATION (1981)	EXISTING WELLS			DIMENSION		
			WATER CONDITION IN DRY SEASON		FOR IRRIGATION (NOS)	DEPTH m	DIA-METER m	WATER TABLE m
			ENOUGH (NOS)	NO WATER (NOS)				
1. Koral	(8)	(4,546)	(58)	(1)	(0)	(20)	(1.7)	(13)
	1 Koral	862	12	0	0	15	1.5	8.6
	2 Bora Bangial	686	4	0	0	23	1.8	15
	3 Choocha	425	6	0	0	20	1.5	12
	4 Bhookar	455	6	0	0	20	1.8	14
	5 Panwal	308	3	1	0	21	1.8	15
	6 Pahg	145	5	0	0	20	1.5	12
	7 Loi Bher	1,665	22	0	0	18	1.8	11
	8 Raki Loni Bher	-	-	-	-	-	-	-
2. Rawat	(14)	(11,455)	(43)	(27)	(0)	(30)	(3.0)	(27)
	1 Rawat	3,769	0	13	0	37	3.0	34
	2 Bhangril Khurd	254	1	0	0	26	6.4	24
	3 Bhangril Kalan	333	0	4	0	23	2.7	24
	4 Sheikhpur	340	3	0	0	27	2.7	24
	5 Murikhumbal	32	1	0	0	27	2.7	25
	6 Shadi Dhanial	266	1	0	0	27	2.7	25
	7 Niazian	440	2	0	0	27	2.7	24
	8 Kortana	344	3	0	0	38	2.7	35
	9 Humak	3,745	21	10	0	37	2.1	30
	10 Kotha Kalan	1,648	11	0	0	29	2.1	26
	11 Bamla Kanyat	284	0	0	0	-	-	-
	12 Sud Gangal	0	-	-	-	-	-	-
	13 Muhra Amir	0	-	-	-	-	-	-
	14 Takht Pari	0	-	-	-	-	-	-

UNION COUNCIL	VILLAGE	POPULATION (1981)	EXISTING WELLS			DIMENSION		
			WATER CONDITION IN DRY SEASON		FOR IRRIGATION (NOS)	DEPTH m	DIA-METER m	WATER TABLE m
			ENOUGH (NOS)	NO WATER (NOS)				
3. Sihala	(14)	(16,033)	(93)	(12)	(12)	(17)	(2.1)	(10)
	1 Gagri	1,143	16	0	0	18	2.1	5
	2 Nara Sayedan	571	4	1	0	14	2.1	3
	3 Chak Kamdar	286	0	2	0	9	2.1	1.5
	4 Tabi Gakhran	162	2	0	0	15	2.1	3
	5 Sandu	76	0	0	0	-	-	-
	6 Har-do-Gaher	1,068	4	0	0	14	2.1	5
	7 Jandala	379	2	0	0	23	2.1	18
	8 Ladhot	443	5	0	0	18	2.1	14
	9 Kangota Gunjran	560	5	0	0	18	2.1	15
	10 Chuchkal	428	3	0	0	14	2.1	11
	11 Hoon Dbamial	2,176	4	4	0	24	2.1	23
	12 Sihala	4,536	38	0	12	14	2.1	6
	13 Mughal	4,138	15	5	0	18	2.1	14
	14 Chitroh	67	-	-	-	-	-	-
4. Bhara Kau	(6)	10,590	(46)	(24)	(7)	(22)	(3.0)	(19)
	1 Shah Darah	1,819	8	1	0	21	3.0	18
	2 Subhan	413	0	3	0	22	3.0	21
	3 Mandola	327	1	0	0	23	3.0	21
	4 Mangial	289	1	0	0	22	3.0	21
	5 Kot Hathial	5,066	8	20	2	21	3.0	18
	6 Mohra Noor	2,676	35	0	5	21	3.0	17
5. Phulgran	(16)	(11,248)	(41)	(20)	(0)	(19)	(2.1)	(15)
	1 Kuri	2,248	4	0	0	27	1.8	24
	2 Malot	1,516	13	2	0	18	1.8	15

UNION COUNCIL	VILLAGE	POPULATION (1981)	EXISTING WELLS			DIMENSION		
			WATER CONDITION IN DRY SEASON		FOR IRRIGATION (NOS)	DEPTH m	DIAMETER m	WATER TABLE m
			ENOUGH (NOS)	NO WATER (NOS)				
	3 Rihara	571	5	2	0	17	4.5	12
	4 Bobri Betha	552	-	-	-	-	-	-
	5 Sikrila	212	-	-	-	-	-	-
	6 Chattar	16	-	-	-	-	-	-
	7 Hotran	114	-	-	-	-	-	-
	8 Karlot	132	3	0	0	14	1.5	9
	9 Athal	1,183	5	1	0	18	1.5	16
	10 Phulgran	4,426	-	-	-	-	-	-
	11 Dohala	70	-	-	-	-	-	-
	12 Shahpur	87	11	15	0	18	1.8	14
	13 Rakh Bangla	0	-	-	-	-	-	-
	14 Chamari	0	-	-	-	-	-	-
	15 Mangal	15	-	-	-	-	-	-
	16 Kathar	106	-	-	-	-	-	-
6. Shah Allah Ditta	(5)	(7,576)	(10)	(0)	(1)	(7)	(1.7)	(4.5)
	1 Dhok Jori	1,626	-	-	-	-	-	-
	2 Shah Allah Ditta	2,241	6	0	1	5	1.2	4
	3 Talhar	1,291	0	0	0	-	-	-
	4 Sinar Sandhori	300	3	0	0	11	2.4	8
	5 Gokina	2,118	1	0	0	5	1.5	1.5
7. Tarlai	(10)	(12,289)	(90)	(9)	(31)	(16)	(1.5)	(13)
	1 Chahatta Bakhtawar	863	5	0	0	15	1.8	12
	2 Tarlai Kalan	3,568	10	3	0	15	1.5	14
	3 Chhappar Mir Khanai	735	4	0	0	15	1.5	12
	4 Suhder	201	4	0	0	18	1.5	15

UNION COUNCIL	VILLAGE	POPULATION (1981)	EXISTING WELLS			DIMENSION		
			WATER CONDITION IN DRY SEASON		FOR IRRIGATION (NOS)	DEPTH m	DIAMETER m	WATER TABLE m
			ENOUGH (NOS)	NO WATER (NOS)				
	5 Taramri	132	3	0	0	15	1.5	12
	6 Tarlai Khurd	654	6	3	0	15	1.2	12
	7 Gohra Sardar	279	2	1	0	15	1.5	12
	8 Gamdhian	83	2	0	0	15	1.5	12
	9 Khana Dak	5,072	28	0	13	15	1.5	9
	10 Gangal	702	26	2	18	20	1.5	15
8. Sohan	(13)	(13,162)	(172)	(2)	(106)	(8)	(2.6)	(5)
	1 Sohan Dehati	1,914	67	0	44	8	3.0	6
	2 Pandori	602	10	0	8	11	3.6	0.8
	3 Khana Kak	208	9	0	6	6	2.4	3
	4 Shak Rial	6,213	13	0	8	6	2.7	4
	5 Jaba Teli	680	20	0	14	9	3.0	6
	6 Sohana	341	20	0	14	9	3.0	6
	7 Bohan	61	4	0	2	9	3.0	6
	8 Chak Shadad	1,983	26	2	10	12	2.4	6
	9 Majohan	295	-	-	-	-	-	-
	10 Chak Bira Singh	411	-	-	-	-	-	-
	11 Mohra Jujan	134	-	-	-	-	-	-
	12 Dhok Sharaf	8	3	0	0	6	2.4	3
	13 Lakhwal	312	-	-	-	-	-	-
9. Kirpa	(23)	(19,480)	(106)	(29)	(0)	(18)	(1.6)	(15)
	1 Kirpa	4,441	15	3	0	18	1.8	14
	2 Jhang Sayadaan	535	4	2	0	15	1.5	12
	3 Siknai	483	3	1	0	15	1.5	12
	4 Panjgran	867	7	0	0	18	1.8	14

UNION COUNCIL	VILLAGE	POPULATION (1981)	EXISTING WELLS			DIMENSION		
			WATER CONDITION IN DRY SEASON		FOR IRRIGATION (NOS)	DEPTH m	DIAMETER m	WATER TABLE m
			ENOUGH (NOS)	NO WATER (NOS)				
	5 Paratal	354	5	0	0	15	1.8	12
	6 Farash	1,505	4	3	0	15	1.8	13
	7 Alipur	1,267	5	1	0	18	1.8	15
	8 Khadrapur	786	5	2	0	15	1.8	12
	9 Tamma	526	2	0	0	15	1.8	12
	10 Gurah Mast	851	5	3	0	18	1.5	15
	11 Pendori Hathial	63	2	0	0	21	1.5	18
	12 Pendori Sayaddan	267	2	0	0	20	1.5	17
	13 Sigga	158	1	0	0	18	1.5	15
	14 Chani Mohsoo Khan	166	3	0	0	18	1.5	15
	15 Pind Malakan	1,450	9	3	0	27	1.5	24
	16 Bhimbar Tarar	1,792	8	5	0	24	1.5	21
	17 Peja	506	3	1	0	18	1.2	15
	18 Darwala	699	5	0	0	14	1.5	11
	19 Khatri	389	2	1	0	18	1.5	15
	20 Pind Dala	564	4	2	0	21	1.5	18
	21 Dhaliyala	846	7	0	0	18	1.5	15
	22 Kangota Sayaddan	424	2	1	0	21	1.5	18
	23 Sher Dhamial	541	3	1	0	21	1.5	18
10. Tamair	(16)	(16,638)	(29)	(15)	(0)	(17)	(1.8)	(14)
	1 Tamair	5,851	14	7	0	18	1.5	15
	2 Kijnah	1,181	2	2	0	12	1.8	10
	3 Siali	939	2	0	0	15	1.8	12
	4 Tandala	259	2	0	0	23	1.8	20
	5 Gahra Thain	148	0	0	0	-	-	-

UNION COUNCIL	VILLAGE	POPULATION (1981)	EXISTING WELLS			DIMENSION		
			WATER CONDITION IN DRY SEASON		FOR IRRIGATION (NOS)	DEPTH m	DIAMETER m	WATER TABLE m
			ENOUGH (NOS)	NO WATER (NOS)				
	6 Jand Gran	153	1	0	0	14	1.8	11
	7 Siml	20	0	0	0	-	-	-
	8 Dakhain	178	-	-	-	-	-	-
	9 Maira Begwal	1,420	2	2	0	18	1.8	14
	10 Pind Begwal	3,489	6	4	0	18	1.8	15
	11 Rakh Tamair (A)	0	-	-	-	-	-	-
	12 " (B)	0	-	-	-	-	-	-
	13 " (C)	0	-	-	-	-	-	-
	14 " (D)	0	-	-	-	-	-	-
	15 Rakh Maira (A)	0	-	-	-	-	-	-
	16 " (B)	0	-	-	-	-	-	-
11. Charah	(8)	(17,837)	(91)	(38)	(5)	(15)	(1.7)	(13)
	1 Charah	7,995	24	8	4	15	1.8	12
	2 Harno-Thanda Pani	2,978	19	15	0	15	1.2	12
	3 Darkala	1,190	2	0	0	18	2.1	20
	4 Jagiot	2,597	10	6	1	15	1.8	12
	5 Naugazi	324	5	0	0	15	1.8	12
	6 Ara	701	4	2	0	15	1.8	12
	7 Muhrian	2,015	25	6	0	15	1.5	12
	8 Gahora Baz	37	2	1	0	15	1.5	12
Grand Total	133	137,854	786	177	162	(17)	(2.0)	(14)

II. SOCIOECONOMIC SECTOR

CONTENTS

		<u>Page</u>
II-1	Fact Finding Survey in the Study Area - Through Questionnaires and Inquires	II-4
II-2	Inquiry Survey on Panchayats	II-33
II-3	Present Economic Conditions of Pakistan	II-37
II-4	Water Users Association and Water Right	II-43
II-5	List of Elected/Official Members of Rural Area Coordination Committee (RACC)	II-45
II-6	Classification of Union Councils and Their Demands	II-47
II-7	Tables and Figures	II-53
II-8	Form of Questionnaire	II-92

LIST OF TABLES AND FIGURES

TABLE II-1	Basic Facts of Villages Selected for the Sample Survey	II-20
TABLE II-2	Village-wise Principal Data by Land Holdings	II-21
TABLE II-3	Results of Questionnaires	II-22
TABLE II-4	Needs Raised by Panchayats	II-36
TABLE II-5	Gross National Product at Current Factor Cost	II-39
TABLE II-6	Sectoral Growth Rates of Gross Domestic Product	II-40
TABLE II-7	Price Trends	II-41
TABLE II-8	Foreign Exchange Receipts, Expenditures and Financing	II-42
TABLE II-9	Annual Development Programme (Draft Budget) Islamabad Administration 1985-86	II-54
TABLE II-10	On-going Rural Development Schemes in Islamabad Administration	II-56
TABLE II-11	Statistical Information on the Post Offices	II-58
TABLE II-12	State of Playing Fields in Islamabad	II-59
TABLE II-13	Educational Facilities in Rural Area	II-60
TABLE II-14	High Schools Building Facilities	II-61
TABLE II-15	Boys' Middle Schools Building Facilities	II-63
TABLE II-16	Girls' Middle Schools Building Facilities	II-64
TABLE II-17	Boys' Primary Schools Building Facilities	II-65
TABLE II-18	Girls' Primary Schools Building Facilities	II-68

		<u>Page</u>
TABLE II-19	High Schools Educational Furniture	II-71
TABLE II-20	Middle Schools Educational Furniture	II-73
TABLE II-21	Boy's Primary Schools Educational Furniture	II-75
TABLE II-22	Girl's Primary Schools Educational Furniture	II-78
TABLE II-23	Manpower of the Health Department, ICT	II-81
TABLE II-24	Comparative Crime Statement of Rural Area	II-82
TABLE II-25	Comparative Crime Statement of Urban Area	II-83
TABLE II-26	Population of Islamabad Rural Area Based on 1981 Census	II-84
FIG. II-1	Village Selected for the Enquiry Survey	II-32
FIG. II-2	Organization Chart of Islamabad Police	II-90
FIG. II-3	Block Plan of Typical Farm Housing	II-91
FIG. II-4	Organization Chart of CDA	II-92

II-1 FACT FINDING SURVEY IN THE STUDY AREA
THROUGH QUESTIONNAIRES AND INQUIRIES

1. SURVEYS APPLIED

(1) Sample Survey (by Questionnaires)

The Team, in cooperation with counterpart personnel from IA, conducted an extensive enquiry survey on a sampling basis in order to collect primary data on rural Islamabad. These data were supplementary to data and information collected from other sources. The survey commenced on March 28, 1985 and was completed on April 7, 1985.

(2) Basic Fact Finding Survey on UCs

In addition to the aforementioned survey, a separate form village level questionnaire was prepared by the Team and IA. Copies of the Urdu version were sent to all the UC offices in the Study Area and necessary data was filled in by each secretary.

This questionnaire was designed to obtain basic data on each village including population and number of households, physical area, water source, electricity, market facility, educational and medical facilities and roads. However, data on population and physical area were not immediately available from UC offices and were therefore referred to the 1981 Census Report of Islamabad and village land use data prepared by the Land Revenue Department of IA, respectively.

(3) Interviews with Individuals

Aside from these systematized surveys, each member of the Team conducted interviews with reputable citizens, farmers as well as personnel of local agencies in connection with his own field of study throughout both the 1st and 2nd stage field work in the Study Area. Data and information collected are reflected elsewhere in this report.

2. SAMPLE SURVEY BY QUESTIONNAIRES

(1) Objectives of the Survey

The main objectives of this survey were:

- a) to obtain primary data on demographic and economic features of rural households;
- b) to grasp agricultural, physical and social aspects of the Study Area; and,
- c) to determine the interests and wishes of rural inhabitants pertaining to rural development.

(2) Universe

There are 20,804 households in the Study Area with a total population of 137,854 as of the 1981 Population Census. The above population resides in 133 villages, divided into 11 administrative units called Union Councils.

(3) Sample Selection

Prior to commencement of the survey, the Team and IA mutually agreed on sample size, as follows:

- Number of villages to be surveyed 9
- Number of households to be surveyed 450

This agreement was made mainly on the basis of time constraints; however, the said sample size was expected to yield accurate estimates of important characteristics with a proper degree of confidence.

In accordance with the above agreement, 9 villages were duly selected in consideration of population distribution, location, topographical features, and accessibility to infrastructural facilities so that these villages might represent the entire Study Area. The location of selected villages is shown in FIG. II-1.

Since this survey was based on the quota sampling method, IA officials assigned as interviewers to the 9 villages were instructed to select 50 households from each village as samples at their own discretion, without any bias and including landless households as well as land operators regardless of size.

Basic facts of villages selected for the enquiry survey are presented in TABLE II-1.

(4) Data Collection

In order to facilitate the sample survey after careful review of content, a questionnaire form was prepared both in the English and Urdu languages by Team and IA officials. The questionnaire was comprehensive, covering every aspect of the aforementioned survey objectives. Copies were taken to each selected household and responses were recorded on the same by the interviewers. Efforts were made by the interviewers to ensure the correctness of the respondents' answers by cross-questioning and editing.

Basic facts on sample households, derived from the survey results and backed by data and information from other sources, are hereinafter mentioned.

3. FORM OF LIVING

(1) Family Composition

The total population of the 450 sample household was 3,366, with an average household size of 7.5. The largest households consisted of 40 members and the smallest with only one. The average number of household members in the Study Area was 6.6 while that of all Pakistan was 6.7^{1/}, therefore, households with larger members had eventually been chosen as samples.

(2) Landholding Size

These households were divided into two groups; those with cultivated landholdings (311 households) and those without (139 households). The latter accounted for 31% of sample households.

Table below further reveals that, of the former, 71% of landholdings were less than 5.0 acres, while the percentage of households with landholdings of less than 25.0 acres is 99%. This fact indicates that, at least in the selected nine villages, almost all farm households consist of small farms, or in the Barani area, subsistence farmers as defined in the Sixth Five Year Plan (1983-88).

^{1/} Calculated from 1981 Census Report of Pakistan

**DISTRIBUTION OF HOUSEHOLDS
ACCORDING TO CULTIVATED LANDHOLDING**

Area (Acres)	No. of Households	Percentage (Cumulative)	Area of Cultivated Land (Acres)	Percentage (Cumulative)
Less than 5.0	221	71	543.5	34
5.1 - 12.5	65	92	518.5	66
12.6 - 25.0	21	99	372.5	89
More than 25.1	4	100	180.0	100
Total	311	(100)	1,614.5	(100)

According to the Pakistan Census of Agriculture 1980, the number of farmhouses which hold cultivated land of less than 5 acres number as low as 34% of the total farmhouses of Pakistan, while, in the Study Area, it numbers as high as 74%. If the farm households with less than 85 acres of farmland are added, it numbers more than 98% of the total in the Study Area. It is thus clear that agriculture in the Study Area depends solely on the smaller farms.

Furthermore, equal succession of landholding prevails in Pakistan due to the Islamic jurisdiction. Therefore, the holding size of cultivated land continues to be fragmented at each generation change.

(3) Classification of Households

1) Characteristics of Households

Household classification is presented in the following table.

CLASSIFICATION OF HOUSEHOLDS

Classification	No. of Households	Percentage Against Total No. of Households
Households with landholdings	338	75
Households with cultivated landholdings	311	69

Cont'd

Classification	No. of Households	Percentage Against Total No. of Households
Households with member(s) working on farm	284	63
Households with head mainly engaged in agriculture (self-employed)	130	29
Households whose main source of income is agriculture	150	33

From this table, the following characteristics of rural household are envisaged. Firstly, 388 households (75% of the total 450) own their own lands, with 311 among them (92%, or 69% against the total) owing cultivated lands. That is to say, 27 households (6% of the total) own their own land for house compounds only, without having any cultivated land. Further, 112 households (25% of the total) do not own any land at all. In view of the above, it is envisaged that 31% of the total household heads are engaged either in agricultural labour or in the non-agricultural sector.

Secondly, the number of households whose member, male or female, is engaged in any kind of agricultural labour numbers 284 (63% of the total), among whom 46% (29% against the total) are actually in agriculture.

It is clear that 181 households (40% of the total) have occupants who seem to be engaged in non agricultural sector while they own their own cultivated land. This is due to the small landholding size. On the other hand, households whose main source of income is agriculture number 150 (33% of the total), therefore, the remaining 67% or 300 households depend their livelihood on the non-agricultural sector since Barani agriculture cannot afford to furnish them with sufficient income.

In this connection, estimated sectoral employment in agriculture, including forestry, hunting and fishing, numbers 52% of total labour force of Pakistan.^{1/}

2) Non-agricultural Occupations

Main occupations of householders by income source other than farmers are shown in the Table below. As the Study Area is situated on the outskirts of urban Islamabad where governmental offices are located and are still under construction, householders engaged in public services and day labours accounted for as much as 37% and 32% of the total respectively.

**MAIN OCCUPATION OF HOUSEHOLDERS BY
INCOME SOURCE OTHER THAN FARMERS**

Occupation	No. of Households	Percentage
Agricultural Day Laborer	15	5
Public Services	119	37
Commerce/Business	56	18
Driver	10	3
Factory Worker	4	1
School Teacher	6	2
Foreign Remittance	7	2
Others ^{1/}	102	32
Total	320	100

^{1/} Consists mainly of day labourers.

(4) Drinking Water

It is noted that 364 households, 81% of the total, depend on wells for their drinking water.

^{1/} Pakistan Economic Survey 1983-84.

In comparison with urban Islamabad where 63% depend on water service through taps inside the house and 24% on wells^{1/}, it is clear that the Study Area is far behind in this respect.

The average distance between the water source and houses is estimated around 500m due to varying geographical location of villages, e.g., 1,900m in Kot Hathial located in the hilly area, while 200m in Jhang Sayaddan located on the plain.

According to the Village Basic Facts Survey conducted by LGRD, the average population dependent on a well is 157. In UC Shah Allah Ditta, it is as many as 316, while in UC Koral, it is only 77. This shows that people in UC Koral are more conveniently located in view of the accessibility to drinking water.

In the Study Area, it is mainly women and children who are engaged in water carrying work. They carry 18ℓ (4 gallons) of water at a time in an unglazed pot called Ghara. The average time consumed for such water carrying work per household is 3 hours and 36 minutes. This differs with the distance between the water source and houses. Water carrying work is often undertaken by some women and children in turn and not always by a specific family member.

Households maintaining a well inside the house compound numbers as little as 59, 13% of the total. Accordingly, women and children are engaged in the tedious task of water carrying in most of the sample households.

(5) Sanitation

According to the result of sample survey, 429 households, or 95% of the total, have no toilet facilities inside the house compounds. This percentage coincides with the UNICEF's estimate of 97% on the same subject^{2/}.

^{1/} Census Report of Islamabad, 1981

^{2/} (Draft) Rural Women's Development Programme, 1985

On the other hand, 60% of total houses in Islamabad urban area are furnished with water closets,^{1/} According to the Ministry of Education, only 10% of total 189 primary schools in the Study Area are furnished with lavatories. This clearly indicates that the Study Area is far behind in respect to sufficient sanitary and health conditions.

(6) Electrification

Two of the nine sample villages are not electrified while the remaining are fully or partly electrified. Some households were settled after the electricity supply work was completed, therefore, the rate of electrification is not exactly 100% even in the fully electrified villages.

The average electrification rate of all the 9 villages is 64%, a little higher than that of the whole Study Area at 65%, or of all Pakistan at 31%.^{2/}

The average monthly electricity charge for sample households with electricity was Rs 46.

(7) Fuel

The main fuel in the Study Area was firewood of which 92% of sample households were dependent. Kerosene was also used by 25% of total households. Firewood was obtained mainly from the markets where 83% of households purchased the same, while only 17% collected wood from their own forests.

In the urban area of Islamabad, piped or cylinder gas is used by 59% of the total housing units.^{1/} Although, firewood, kerosene and cow dung cake are generally the preferred fuel in Pakistan, firewood is used by as much as 70% of total housing units all over the country.^{3/} Furthermore, 79% of housing units in rural Pakistan use firewood as fuel.

^{1/} Census Report of Islamabad, 1981

^{2/} Pakistan Economic Survey 1983-84

^{3/} Housing Census, 1980

4. FORM OF AGRICULTURE

(1) Cultivated Landholding Size

According to the basic fact finding survey on UCs, the average cultivated landholding size of farms in the Study Area is 2.5ha (6.2 acres). The sample survey by questionnaire resulted as compiled in the table below. From this table we see that 71% of sampled farms hold cultivated land of less than 2.0ha (5.0 acres), with the average landholding size of this group at only 1.0ha (2.5 acres). The remaining 29% of farms hold as much as 66% of total cultivated land, which raises the nominal average landholding size of the farms.

In reality, however, the majority of the farm households cultivate land of more or less 1.0ha, and 7 to 8 household members depend their livelihood on the products thereof (Table II-2).

**DISTRIBUTION OF HOUSEHOLDS
ACCORDING TO CULTIVATED LANDHOLDING**

Area (Acres)	No. of Households	Percentage (Cumulative)	Area of Cultivated Land (Acres)	Percentage (Cumulative)
Less than 5.0	221	71	543.5	34
5.1 - 12.5	65	92	518.5	66
12.6 - 25.0	21	99	372.5	89
More than 25.1	4	100	180.0	100
Total	311	(100)	1,614.5	(100)

(2) Agricultural Credit

From among 450 sample households, 395 (or 88%) have never used agricultural credit, while 18 (or 4%) used institutional credits such as those of ADBP, commercial banks, cooperatives and the Taccavi Loan. The rest 37 (or 8%) used non-institutional credits such as those of friends and relatives.

Institutional credits are not popular among the people of the Study Area partly because such organization have put priority on middle and large income farmers who have high potential for reimbursement of credits. Further, the percentage of those households who have never used agricultural credits is quite high because of the following reasons, viz., i) the Study Area is located in the vast Barani tract and, therefore, the agricultural productivity is quite low, ii) most farm households belong to small or subsistence farmers who are unable to produce any surplus crops, thus getting cash income not from agriculture but from other sources, iii) therefore farmers' incentive on investing their capital in agricultural inputs and machinery is quite low.

(3) Agricultural Machinery and Implements

The following table shows the Study Area far behind in the mechanized farming. The number of individual farmers who can afford to procure tractors, pumps, tubewells, etc., is quite limited. In most cases, the plowing and tilling works are carried out by animals or manually, however, there are about 225 tractors, throughout the Study Area, used for agricultural works on a hiring basis at Markaz as well as those of private ownership.

AGRICULTURAL IMPLEMENTS OWNED BY HOUSEHOLDS

Type	Nos
Hoe	711
Plough	323
Cart	30
Powered Pump	18
Power Tiller	7
Tractor	14
Sprayer	2
Others ^{1/}	125

^{1/} Including tools and manually operated small items.

(4) Income Source

Main income sources of sample households are shown in the table below. Households dependent on agricultural income comprised 33% of the total, while those dependent on non-agricultural income consisted of 66%.

As mentioned previously, the number of households who maintain cultivated land is 311. Thus, households who hold cultivated land but are not dependent on the income thereof, number 48% of the total. This coincides with the fact that many small and subsistence farmers resort to the urban area looking for jobs since their lands under the Barani condition do not produce crops for self sufficiency.

MAIN INCOME SOURCE OF HOUSEHOLDS

Source of Income	No. of Households	Percentage
Agriculture	150	33
Non-agriculture	295	66
Both Agriculture and Non-agriculture	5	1
Total	450	100

(5) Livestocks

Following table shows the types and number of livestock held by sample households irrespective of landholding or not.

The average livestock holding size of selected households seems to coincide more or less with that of the whole Study Area.

LIVESTOCK OWNED BY HOUSEHOLDS

Type	Head	No. of Household	Average Head/Household
Draft Animals	325	156	2.1
Milch Cows	283	202	1.4
Milch Buffaloes	324	217	1.5
Sheep	57	19	3.0
Goats	883	176	5.0
Poultry ^{1/}	1,901	251	7.6
Others ^{2/}	108	81	1.3

^{1/} There are two poultry farms owned by sample households with breeding capacity of 2,000 and 5,000 birds respectively.

^{2/} Including donkeys and camels.

5. NEEDS OF THE RURAL POPULATION

(1) Desired Items

Table below shows the commodities householders would most likely buy if they could afford them. Each householder was asked to name three such items. A large number of householders put priority on producer rather than consumer goods, which clearly indicated the needs for rural development felt by the inhabitants.

ITEMS WHICH THE HOUSEHOLDER WOULD BUY IF HE HAD THE FINANCIAL RESOURCES

Items	No. of Households	Percentage
Tractor	155	11.5
New House (incl. improvement of existing house)	146	10.8
Suzuki/Car/Truck	132	9.8
Land	125	9.3
Household (Electric) Appliances	121	9.0
Poultry Farm	61	4.5
Shop/Business	60	4.4

Cont'd

Items	No. of Households	Percentage
Tubewell/Pump Well	54	4.0
Livestock	41	3.0
Thresher/Grass Cutter/ Agricultural Machinery	39	2.9
Others ^{1/}	217	16.1
No Answer	199	14.7
Total	1,350	100

^{1/} Including i) Factory/workshop/small industries, ii) Education of children, iii) Marriage of family members/relatives, iv) Motorcycles, v) Trolley, vi) To go for Haj, vii) To work abroad, and viii) Dairy farm.

(2) Urgent Desires

Table below shows what was most desired by the householders in the near future. The question was asked as to what kind of item did they expect in the very near future irrespective of cost. Certain answers overlapped with those of the previous table.

**ITEMS MOST DESIRED BY THE HOUSEHOLDER
IN THE NEAR FUTURE**

Items	No. of Households	Percentage
Haj (to perform Haj)	102	22.7
New House/Accommodation	40	8.9
Agricultural Machinery/ Equipment	27	6.0
Higher Education for Children	27	6.0
Marriage of Children	23	5.1
Business	22	4.9
Infrastructure	20	4.4
Employment	19	4.2
Land	14	3.1
Agro-based Industries	13	2.9

Cont'd

Items	No. of Households	Percentage
Others ^{1/}	99	22.0
Nothing	44	9.8
Total	450	100

^{1/} Including i) Agro-based industries, ii) Vehicles, iii) Social welfare, iv) Social justice, v) To serve Islam and vi) Money.

(3) Wish for Improvement of Living Conditions

Householders were also questioned about what would improve the quality of their lives, listing three specific items. Following table shows the results of this question.

TABLE ITEMS WHICH WOULD IMPROVE THE QUALITY OF THE HOUSEHOLDER'S LIFE

Items	No. of Households	Percentage
Water Supply System	172	12.7
Education (Higher; Improved)	165	12.2
Health/Medical Facilities	157	11.6
Gas Supply System	149	11.0
Road (incl. pavement)	145	10.8
Electricity	63	4.7
Agro-based Industries	54	4.0
Telephone System	28	2.1
Tubewell	23	1.7
Agricultural Machinery/ Equipment	23	1.7
Others ^{1/}	116	8.6
No answer	255	18.9
Total	1,350	100

^{1/} Including i) Employment/job opportunity, ii) House, iii) Drainage system, iv) Money, v) Land, vi) Business and vii) Factory/Workshop.

About 70% of total answers concerned needs for both social and physical infrastructures. Certain preferences existed as householders belonged to villages with different living conditions and characteristics. For example, many householders in non-electrified villages listed electricity first, while those lacking medical facilities preferred installation of a medical center or institution.

6. SENTIMENT OF RURAL POPULATION

(1) Most Pleasant Occasions

Table below shows occasions which householders regard as most pleasant in their past. From this table, the average figure of Pakistani farmers, who respect the family members and relatives and wish for their happiness, can be drawn out easily.

MOST PLEASANT OCCURRENCES IN THE PAST

Items	No. of Households	Percentage
Birth of Child (Children)	107	23.8
Own Marriage/Children's/ Relatives'	79	17.5
Independence of Pakistan	50	11.1
Haj Performed by Self/ Family/Relatives	21	4.7
Acceptance for Overseas Employment	11	2.4
Others ^{1/}	70	15.6
No answer	112	24.9
Total	450	100

^{1/} Including i) Acceptance for employment/job, ii) Success in examination by self/family/relatives, iii) Recovery from injury/disease, and iv) Return from (then) East Pakistan.

(2) Most Unpleasant Occasions

Likewise, table below shows occasions which householders regard as most unpleasant in their past.

Majority of the people listed the death of their family members or relatives as one such occasion. In Pakistan, specially in the Punjab where paternal Kinship is quite strong, there exists a patrilineal society called Bradari. If a member of any Bradari dies, all the remaining members of the society are expected to mourn and pray for the deceased. The result shown in the table seems to emphasize this fact.

MOST SORROWFUL HAPPENING IN THE PAST

Items	No. of Households	Percentage
Death of Family Member/ Relatives	276	61.3
Separation of the East Pakistan	51	11.3
Accident or Injury to Self/Relatives	19	4.2
Others ^{1/}	43	9.6
No answer	61	13.6
Total	450	100

^{1/} Including i) Disease of self/family/relatives; ii) Death of friend and iii) Life itself.

TABLE II-1
BASIC FACTS OF VILLAGES SELECTED FOR THE SAMPLE SURVEY

	Population	No. of Household	No. of Farm Household	Total Area (km ²)	Area of Cultivated Land (ha=0.01km ²)	Population Density per km ²	Average Household Size (persons)	Average Cultivated Land Holding Size (ha)	Electricity
1. KOT HATHIAL	5,066	830	126	7.74	316	655	6.1	2.5	FULLY
2. PHULGRAN 1/	4,426	683	174	15.91	676	278	6.5	3.9	FULLY
3. ALI PUR	1,267	168	60	2.33	148	544	7.5	2.5	FULLY
4. SOHAN DEHATI	1,914	510	250	3.52	171	544	3.8	0.7	FULLY
5. TAMAIR	5,851	889	318	34.43	1,385	170	6.6	4.4	PARTLY
6. JHANG SAYADDAN	535	85	55	2.21	129	242	6.3	2.3	FULLY
7. BHIMBAR TARAR	1,792	435	272	8.48	329	211	4.1	1.2	NO
8. SHEIKH PUR	340	53	42	3.71	94	92	6.4	2.2	NO
9. HAR-DO-GAHER	1,068	81	21	4.13	174	259	13.2	8.3	PARTLY
TOTAL	22,259	3,734	1,318	82.47	3,421	270	6.0	2.6	
ISLAMABAD RURAL	137,854	20,804	8,182	490.96	20,864	281	6.6	2.5	

SOURCE: Survey on Basic Facts of Villages by IA, 1985
1/ Data include those of Dohala and Shahpur village

TABLE II-2

VILLAGE-WISE PRINCIPAL DATA BY LAND HOLDING

	Kot Hathial	Phulgrah	All Pur	Sohan Dehati	Tamair	Jhang Sayaddan	Bhimbar Tatar	Sheikh Pur	Har-do- Gaher	TOTAL
Landless (0 Acres)										
No. of Household (Nos.)	38	11	16	20	11	17	3	6	17	139
Population (Persons)	263	68	103	138	71	100	17	22	117	899
Cultivated Land (Acres)	0	0	0	0	0	0	0	0	0	0
Less than 5.0 Acres										
No. of Household (Nos.)	8	32	27	16	22	20	42	25	29	221
Population (Persons)	75	237	216	149	177	111	284	129	284	1,662
Cultivated Land (Acres)	18.5	51.75	71.5	51.75	62	49	96	69.5	73.5	543.5
5.1 - 12.5 Acres										
No. of Household (Nos.)	3	2	4	7	13	13	4	16	3	65
Population (Persons)	25	31	40	87	104	99	33	99	43	561
Cultivated Land (Acres)	24	17	28	68	94	99	36	132	20.5	518.5
12.6 - 25.0 Acres										
No. of Household (Nos.)	1	3	3	5	4	0	1	3	1	21
Population (Persons)	6	21	18	51	32	0	13	25	16	182
Cultivated Land (Acres)	20	58	52	88.5	64	0	15	51	24	372.5
More than 25.1 Acres										
No. of Household (Nos.)	0	2	0	2	0	0	0	0	0	4
Population (Persons)	0	16	0	46	0	0	0	0	0	62
Cultivated Land (Acres)	0	90	0	90	0	0	0	0	0	180
GRAND TOTAL										
No. of Household (Nos.)	50	50	50	50	50	50	50	50	50	450
Population (Persons)	369	373	377	471	384	310	347	275	460	3,366
Cultivated Land (Acres)	62.5	216.75	151.5	298.25	220	148	147	252.5	118	1,614.5

TABLE II-3 (1) RESULTS OF QUESTIONNAIRES

1. DEMOGRAPHIC STRUCTURE

	Kot	Phulgran Ali Pur	Sohan	Tamair	Jhang	Bhimbar	Sheikh	Kar-do-	TOTAL
	Hathial		Dehati		Sayadnan Farar	Farar	Pur	Caher	(Average)
1.1 Total Population of Sample Household	369	373	471	384	310	347	275	460	3,366
1.2 No. of Household (Total)	50	50	50	50	50	50	50	50	450
a) Holding Cultivated Land	12	39	30	39	33	47	44	33	311
b) Not Holding Cultivated Land	38	11	20	11	17	3	6	17	139
1.3 Average Household Size	7.38	7.46	9.42	7.68	6.20	6.94	5.50	9.20	(7.48)
1.4 No. of Adult Male Population	120	224	150	158	115	252	144	295	1,608
1.5 Literate Population	85	129	145	133	145	136	65	240	1,249
1.6 No. of Primary Schoolboys/Schoolgirls	43	72	65	53	34	61	44	127	567
1.7 No. of Family Members Working on Farm	29	51	67	45	94	56	69	65	577
1.8 No. of Household with No Members Working on Farm	35	18	20	18	17	11	8	20	166
1.9 No. of Permanently Hired Labours	2	14	7	1	2	3	0	3	97
1.10 Major Occupation of the Householder									
a) Agriculture	8	5	28	24	8	4	32	15	130
b) Non-agriculture	42	45	22	26	42	46	18	35	320

TABLE II-3 (2)

2. SOCIAL ASPECTS

	Kot	Phulgrān	Ali Pur	Sohan	Tamair	Jhang	Shelkh	Har-go-	TOTAL
	Hathial			Dehati		Sayaddan	Pur	Gaher	(Average)
2.1 Literacy Ratio	23%	35%	45%	31%	37%	47%	39%	24%	52%
2.2 Average Distance to Primary Schools (miles)	0.95	0.29	0.42	0.83	1.3	6.2	1.0	0.14	0.84
2.3 Source of Drinking Water	5	49	50	38	35	50	37	50	364
a) Concreted Well									
b) Others	* 45	1	0	12	15	0	13	0	0
2.4 Water Source Inside House Compound	1	9	5	13	2	19	0	0	10
2.5 Average Distance to Drinking Water Source (yard)	2,077	321	300	423	574	212	452	218	259
2.6 Av. Consumption of Drinking Water (gal./head)	2.2	7.4	9.3	14.0	2.0	1.1	6.1	8.3	4.7
2.7 Av. Hours Consumed for Water Intake Work	6.1	4.0	3.4	5.0	3.1	1.4	4.3	2.7	2.4
2.8 Type of Sanitary Facilities	46	47	46	46	49	49	50	50	429
a) Open Space									
b) Water Flush	1	0	4	0	1	1	0	0	8
c) Others	3	3	0	4	0	0	0	0	13
2.9 Availability of Electricity (%)	84%	82%	94%	70%	70%	92%	0%	0%	88%
2.10 Av. Monthly Payment for Electricity (Rs)	39	44	44	92	43	35	0	0	26
2.11 Fuel Material (Multiple Answers)									
a) Firewood	42	50	45	41	50	44	50	50	415
b) Kerosene	0	11	16	18	0	15	34	0	128
c) Others	8	4	23	20	0	16	2	0	112
2.12 Source of Firewood	0	7	2	1	24	9	18	6	77
a) From Own Forest									
b) From Market	50	43	48	49	26	41	32	44	373
* Spring									

TABLE II-3 (3)

3. AGRICULTURAL ASPECTS

	Kot Rathial	Phulgrān Ali Pur	Sohan Dehati	Tamaif	Jhang Sayaddan	Bhimbar Tarar	Sheikh Pur	Har-do- Gahez	TOTAL (Average)
3.1 Land Ownership									
a) Nil	37	9	8	20	8	5	2	6	112
b) 0.1 - 5.0 Acres	8	34	31	12	15	21	31	21	198
c) 5.1 - 12.5 Acres	3	1	6	10	21	22	12	13	93
d) 12.6 - 25.0 Acres	1	1	4	6	4	2	5	7	31
e) More Than 25.1 Acres	1	5	1	2	2	0	0	3	16
3.2 Size of Cultivated Land									
a) Nil	38	11	16	20	11	17	3	6	139
b) 0.1 - 5.0 Acres	8	32	27	16	22	20	42	25	221
c) 5.1 - 12.5 Acres	3	2	4	7	13	13	4	16	65
d) 12.6 - 25.0 Acres	1	3	3	5	4	0	1	3	21
e) More Than 25.1 Acres	0	2	0	2	0	0	0	0	4
3.3 Agricultural Credit									
a) Never Used	50	44	41	47	42	46	34	50	395
b) Institutional Credit	0	4	3	3	1	0	1	0	18
c) Non-institutional Credit	0	2	6	0	7	4	15	0	37
3.4 Extension Services									
a) Not Required	0	29	32	37	30	26	5	41	228
b) Services Provided	50	21	18	13	20	24	45	9	222
3.5 Livestocks Owned by the Household									
a) Draft Animals	13	19	22	60	55	19	41	93	325
b) Milch Cows	24	38	15	13	35	21	46	65	283
c) Milch Buffaloes	26	34	13	53	42	11	23	67	312
d) Sheep	1	6	0	0	0	19	2	266	7
e) Goats	34	91	37	24	75	84	40	508	33
f) Poultry	104	5,141	229	2,125	164	77	267	38	470
g) Others	30	2	0	0	37	6	11	17	104

TABLE II-3 (6)

5. FELT NEEDS AND GENERAL IDEAS OF HOUSEHOLDERS

	Kot	Phulgran	Ali Pur	Sohan	Tamair	Jhang	Bhimbar	Sheikh	Har-Go-	TOTAL
	Hathial			Dehati		Sayaddan	Tarar	Pur	Cahez	(Average)
5.1 Things which the householder wants to buy most if he has enough financial resources to afford.										
1) Tractor	20	5	24	20	25	8	29	9	15	155
2) New House (incl. to improve the house)	0	12	15	16	21	34	6	9	33	146
3) Suzuki/Car/Truck	41	6	12	15	5	19	8	10	16	132
4) Land	0	11	23	12	14	32	9	12	12	125
5) Home (Electric) Appliances	38	0	21	0	57	0	0	0	5	121
6) Poultry Farm	0	16	4	6	5	13	9	6	2	61
7) Shop/Business	0	36	5	3	0	10	0	1	5	60
8) Tubewell/Pumped Well	4	4	1	18	0	5	13	0	9	54
9) Livestocks	3	13	10	1	10	0	0	0	4	41
10) Thresher/Grass Cutter/Agrl. Machinery	17	0	0	0	0	0	19	1	2	39
11) Factory/Workshop/Small Industries	3	0	7	3	5	10	0	4	3	35
12) Education of Children	0	16	0	1	0	0	0	0	13	30
13) Marriage of Family Members/Relatives	0	14	0	1	0	10	2	0	2	29
14) Motor Cycle	12	0	0	0	5	0	5	0	0	22
15) Trolley	2	0	0	0	0	0	18	0	0	20
16) Go for Haj	0	6	0	3	0	1	2	0	3	15
Others	10	9	8	10	3	5	2	2	17	66
No Answer	0	2	20	41	0	3	28	96	9	199
TOTAL	150	150	150	150	150	150	150	150	150	1,350

TABLE II-3 (7)

5. FELT NEEDS AND GENERAL IDEAS OF HOUSEHOLDERS

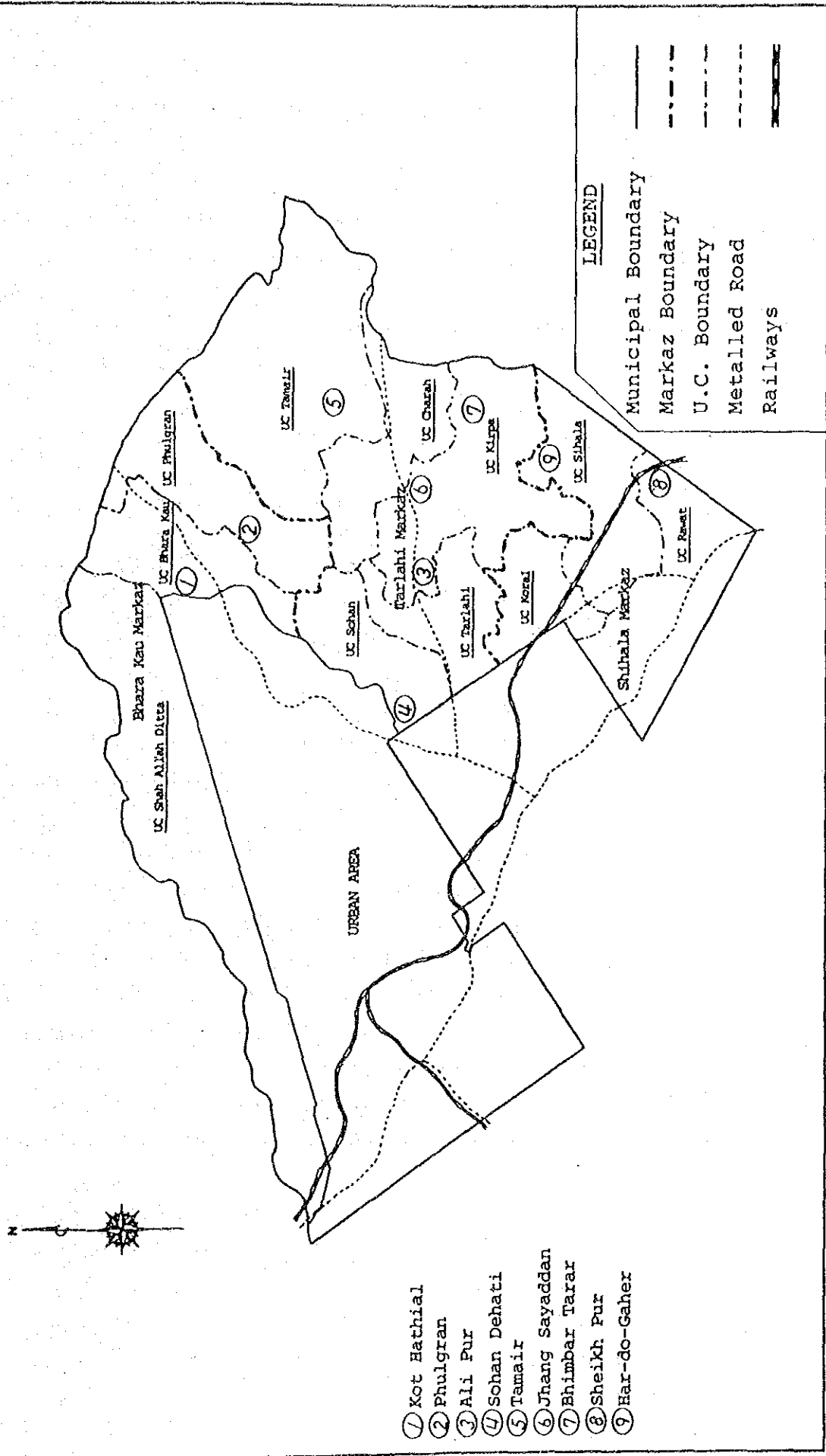
	Kot	Phulgran Ali Pur	Sohan	Tamali	Chang	Bhimbar	Sheikh	Har-do-	TOTAL	
	Hathial		Dehati		Sayaddan	Tarar	Pur	Cahez	(Average)	
5.2 Things which would improve the quality of householder's life.										
1) Water Supply System	49	23	8	17	30	14	13	15	3	172
2) Education (higher/better)	0	42	42	10	35	12	0	1	23	165
3) Health/Medical Facilities	40	47	40	4	0	19	5	2	0	157
4) Gas Supply System	50	5	12	16	15	34	14	0	3	149
5) Road (incl. pavement of streets)	8	13	15	7	37	37	10	18	0	145
6) Electricity	0	2	0	1	8	2	39	11	0	63
7) Agro-based Industries	0	1	1	29	2	5	9	5	2	54
8) Telephone System	0	17	0	3	0	7	0	0	1	28
9) Tubewell	0	0	0	2	0	7	14	0	0	23
9) Agricultural Machinery/Equipments	0	0	1	0	5	1	16	0	0	23
11) Employment/Job Opportunity	0	0	8	0	5	3	0	0	5	21
12) House	0	0	2	1	10	0	0	0	3	16
13) Drainage System	0	0	0	13	1	0	0	0	0	14
14) Money	0	0	0	4	0	0	0	0	9	13
14) Land	1	0	2	0	0	0	0	1	9	13
Others	2	0	9	2	2	0	11	0	13	39
No Answer	0	0	10	41	0	9	19	97	79	255
TOTAL	150	150	150	150	150	150	150	150	150	1,350

TABLE II-3 (10)

5. FELT NEEDS AND GENERAL IDEAS OF HOUSEHOLDERS

	Kot	Phulqran Ali Pur	Sohan Dehati	Tamair	Jhang Sayaddan Tatar	Shimbar	Sheikh Pur	Har-do-Gaher	TOTAL (Average)
5.5 Most desired thing by the householder in his near future.									
1) Haj	0	33	22	1	9	11	9	0	17
2) New House/Accomodation	9	0	0	3	10	4	3	11	0
3) Agricultural Machinery/Equipments	0	0	0	0	7	0	7	13	0
3) Higher Education	5	3	5	1	1	0	6	1	5
5) Marriage of His Children	2	0	2	1	2	8	3	4	1
6) Business	3	1	2	4	0	4	3	1	4
7) Infrastructure	14	0	1	0	3	0	2	0	0
8) Employment	4	0	0	2	0	10	1	0	2
9) Land	0	0	0	1	8	5	0	0	0
10) Agro-based Industries	7	0	0	4	1	0	1	0	0
11) Employment Abroad	0	0	3	2	0	1	0	0	6
11) Vehicles	1	1	0	0	1	1	4	4	0
Others	5	8	13	17	8	6	3	1	14
Nothing	0	4	2	14	0	0	8	15	1
TOTAL	50	50	50	50	50	50	50	50	450

FIG. II-1 VILLAGE SELECTED FOR THE ENQUIRY SURVEY



II-2 INQUIRY SURVEY ON PANCHAYATS

The Team conducted an inquiry survey on Panchayats during its second stage field work in close cooperation with IA officials. A questionnaire, with 50 check items, was prepared by the Team with copies sent to each Panchayat. All the Panchayats were asked to choose five most required items for their community.

Questionnaire

LIST THE 5 MOST NEEDED ITEMS IN THEIR PRIORITY

1. Irrigation and Drainage System
2. Technical Guidance on Irrigation
3. Water Reservoir (Intake-weir, Pond, etc.)
4. Well (shallow well, Deep Tubewell, etc.)
5. Water Supply System (House Consumption Water)
6. Agricultural Machinery for Hiring (indicate type or model)
7. Guidance on Agricultural Technique
8. Orchard (indicate fruit species)
9. Seedlings of Fruit Trees (indicate species of fruit trees)
10. Vegetable Growing Facility (ex. vinyl house for joint growing)
11. Vegetable Seedlings (indicate species of vegetables)
12. Floricultural facility (ex. vinyl house for joint cultivation)
13. Flower Seedlings (indicate species of flowers)
14. Technical Guidance on Horticulture
15. Marketing Facility for Fruits, Vegetables and Flowers
16. Storage for Agricultural Products and/or Fertilizers/Pesticides
17. Suzuki Trucks for Transporting Agricultural Products, Fertilizers, Pesticides
18. Pasture Land (or range land improvement)
19. Seedlings of Fodder Trees
20. Young Cows/Buffaloes (calf)
21. Young Goats (kid)
22. Young Sheep(lamb)
23. Young Poultry Birds (chick)

24. Cooperative Poultry Farm
25. Cooperative Stock Farm
26. Slaughterhouse
27. Market Facility for Meat (Cold Storage, etc.)
28. Fish Pond
29. Fish Fry (indicate species of fish)
30. Cooperative Workshop (ex. Textile Fabrics, Handicraft, etc.)
31. Agricultural Products Processing Plant
32. Flour Mill
33. Woodworking Plant
34. Charcoal Ball and Briquette Factory
35. Seedlings for Afforestation (indicate species of trees)
36. Agricultural Products Direct Sales Shop
37. Observation Spot on Hilly Area
38. Farm to Market Road
39. Cableway, Ropeway
40. Post Box and Public Telephone
41. Electricity
42. School (Primary, Middle/Secondary, High)
43. Sewerage Works
44. Vehicles for Patients (Ambulance, Sleeper, Small Bus)
45. Small Fire Engine
46. Small Water Tank Lorry (for fire fighting or drinking water supply)
47. Community Center (including library, etc.)
48. Nursery (for children of working women)
49. Traffic Signs and Signals
50. Land Consolidation
60. Others (indicate in detail)

After collecting all the questionnaire sheets filed by each Panchayat, the Team summarized those frequently listed items into the following 20 categories.

- 1) Well & Water Supply
- 2) Irrigation & Drainage
- 3) Machinery
- 4) Livestock
- 5) Road (Farm-to-Market)
- 6) Electricity
- 7) Seedlings (Fruits & Vegetables)
- 8) School
- 9) Post (box & office) & Telephone
- 10) Agricultural Technical Guidance
- 11) Vinyl House
- 12) Suzuki Truck
- 13) Sewerage Works
- 14) Cooperative Poultry Farms
- 15) Cooperative Workshop/Factory ^{1/}
- 16) Fish Pond
- 17) Community Center
- 18) Flour Mill
- 19) Land Consolidation, Pasture Land, Orchard
- 20) Marketing Facility, Storage, Direct Sales Shop

Table II-4 shows the distribution of needs and their priority raised by 68 Panchayats. The priority is indicated in alphabetical order, viz., "A" or "a" indicates the first priority while "E" or "e" dictates the fifth. Besides, capital letters correspond to those needs raised by several Panchayats while the small letters to those of single Panchayat.

^{1/} Including agricultural products processing plant, woodworking plant, charcoal ball and briquette factory.

TABLE II-4 NEEDS RAISED BY RANCHAYATS

ITEMS#/ UC	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Others
TAMAIR																					
CHARAH	B	A	C	C.D	E																
KIRPA																					
Eastern	A	a	B	D	d			e		C											
Rockey zone	A	a	B.c	D.E								C.e									
Along Lehrfar Road	a.B	A	c	d						c	C	d.e	d.e	d.e	d.e		e				d.e
Southern	A		a.B.c	C.D	E				b			C.e			e						
PHULGRAN																					
Northern	A.b	b		C.d.e	a	d		b	e					c.d.e							
Southern	A.B	E		C	A	D		B.e		d											Bridge Health Center
BHARA KAU																					
Mt. Area	A	*	B	C	E										D						*Reservoir Veterinary Center
Plain	A		b	b.C.e	d			b						e	c						
SHAH ALLAH DITTA																					
Northern valley		c	d.e	B	A	c		d													Vehicles for Patients
Piedment	a.c		d	e	a.c	B		e							d						
TARLAI KALAN	a.B.c	A	b.C.d	c.D.e				d	e				e			c.d			e		Vegetable, Fruits, Flower
SOHAN	c			a	a.e	b	b	b		a	c	c	d	d		e	c		d		Bio-gas Plant
KORAL	A.b	d.e		b.c				e		a	b		C.d	c.d.e							e
SIHALA																					
North of Sean R.	e				A		B	d				e				c			d		Bulldozer
South of Sean R.	A.B	d	C	e			b.c	b.c				d.c		E				b.c.D*			*Orchard Pasture Land
RAWAT	a.c.e	A.b	a.B.d			c	c	E	b	c		d				e	d			e	Seedling of Fodder-trees

#/ 1. Well & Water Supply, 2. Irrigation, 3. Machinery, 4. Livestock, 5. Road, 6. Electricity, 7. Seedlings, 8. School, 9. Post & Telephone,
10. Agr. Technical Guidance, 11. Vinyl House, 12. Suzuki Truck, 13. Sewage Works, 14. Coop. Poultry Farm, 15. Coop. Work Shop, 16. Fish Pond,
17. Community Center, 18. Flower Mill, 19. Land Consolidation, 20. Marketing Facility

II-3 PRESENT ECONOMIC CONDITIONS OF PAKISTAN

Agriculture is the single largest sector in Pakistan in terms of production, employment and trade. Agricultural production occupies 25% of the Gross Domestic Product (GDP) while the work force employed in agriculture accounts for 52% of the total employed population. The national economy is therefore greatly influenced by agriculture and, as agricultural production fluctuates in correspondence with changes in natural conditions such as weather, etc. (TABLE II-5), the economic foundation tends to be unstable.

According to provisional estimates for 1984-85, GDP grew by 8.4% over the previous fiscal year (July 1984 - March 1985). Compared to the average growth rate of 6.2% for 1976-77 to 1983-84, greater economic growth is expected for 1984-85 (TABLE II-6). The average rate of inflation (based on consumer prices for July - March 1983-84 and 1984-85) was 7.3% compared to 8.9% during the same period last year, while the sharp fall in the price of cotton and cotton related items restrained the increase in wholesale prices to only 4.6% during July - March 1984-85 over the previous year. As a result, the overall inflation rate (as measured by the GDP deflator) is expected to be 5.6% in 1984-85 (TABLE II-7).

Despite a severe depression in agricultural production during 1983-84 with an adverse growth rate of -6.1%, an unusually high growth rate of 9.9% is expected to be achieved during 1984-85. This is particularly high in comparison with the average growth rate of 2.4% in agricultural production from 1976-77 to 1983-84. Growth in manufacturing, however, was restrained to 8.6% as production of cotton yarn and cloth declined drastically. As a result, the per capita national income (at current factor cost) of Rs4,910 in 1984-85 was 9.2% above the previous year. Allowing for a price increase of 5.0% (GNP deflator), the real income of the population increased by over 4% in 1984-85, indicating some reduction in the extent of absolute poverty.

After significant improvement in 1982-83, the balance of payments deteriorated sharply in 1983-84, because of lower growth in merchandise exports and a decline in home remittances from Pakistani workers abroad. This trend continued in 1984-85. Compared to an accumulation of US\$698

million in reserves in 1982-83 and a drawdown of US\$86 million in 1983-84, a reserve drawdown of US\$623 million is expected in 1984-85.

Pakistan has had a continuous deficit in the balance of trade and services, and the deficit in the balance of current accounts has been financed by foreign grants and loans. As a result, the amount of external debt increased continuously and debt servicing created a serious setback in the national economy. The amount of debt service both in interest and principal is estimated to be US\$963 million for 1984-85; therefore, debt servicing constitutes 3.1% of the GNP (TABLE II-8).

TABLE II-5 GROSS NATIONAL PRODUCT AT CURRENT FACTOR COST

Fiscal Years	1970-71		1980-81 (Revised)		1983-84 (Provisional)		1984-85	
	Amount	%	Amount	%	Amount	%	Amount	%
Agriculture	16,236	35.5	69,907	27.8	89,181	23.9	105,663	24.7
Mining & Quarrying	243	0.6	3,149	1.3	4,704	1.3	5,912	1.4
Manufacturing	7,570	16.6	45,669	18.2	75,933	20.3	84,452	19.7
Construction	1,979	4.3	13,659	5.4	19,017	5.1	20,436	4.8
Electricity & Gas Distribution Services	782	1.7	5,684	2.3	8,197	2.2	8,845	2.1
Transport, Storage and Communication	3,014	6.6	19,004	7.5	29,493	7.9	33,334	7.8
Wholesale and Retail Trade	6,806	14.9	39,166	15.6	60,386	16.2	71,529	16.7
Banking and Insurance	882	1.9	6,035	2.4	22,830	3.1	13,476	3.1
Ownership of Dwellings	1,752	3.8	8,309	3.3	22,506	3.0	23,792	3.0
Public Administration and Defence	2,963	6.5	19,257	7.7	32,044	8.6	36,165	8.4
Services	3,475	7.6	21,325	8.5	31,365	8.4	35,574	8.3
GDP	45,702	100.0	251,164	100.0	373,656	100.0	428,178	100.0
Net Factor Income from Abroad	-82		22,692		39,664		37,282	
GNP	45,620		273,856		413,320		465,460	
Population (in million)	61.49		83.84		91.88		94.73	
Per Capita Gross Income (in Rupees)	726		3,266		4,498		4,914	

Source: Pakistan Economic Survey 1984-85

TABLE II-6 **SECTORAL GROWTH RATES OF GROSS DOMESTIC PRODUCT**

	(Percent Per Year)		
	1976-77 to 1983-84	1983-84 Revised	1984-85 Provisional
1. Agriculture	2.40	-6.14	9.87
2. Manufacturing	10.00	8.05	8.57
3. Mining	6.77	2.19	14.72
4. Construction	5.88	8.17	4.90
5. Electricity & Gas	10.15	17.38	7.07
6. Wholesale and Retail Trade	7.44	3.86	10.19
7. Transport and Communications	8.27	6.21	5.19
8. Public Administration and Defence	6.98	7.52	10.04
9. Others	6.09	7.98	5.40
GDP	6.18	3.45	8.43
GNP	6.62	2.96	7.29

Source: Federal Bureau of Statistics, Annual Plan 1984-85.

TABLE II-7

PRICE TRENDS

Price Indices	(Weights)	Average over last year's Average			Cumulative Month to Month	
		1983-84	1984-85	1983-84	1984-85	
		(July-March)	(July-March)	1983-84	1984-85	
Consumer Price Index (CPI)		8.9	7.3	5.6	7.7	
Food & Drinks	(53.5%)	9.0	7.2	6.8	9.6	
Clothing & Footwear	(9.2%)	13.7	12.0	4.4	10.5	
Housing	(20.2%)	4.2	5.7	3.5	3.6	
Misc.	(17.1%)	10.7	6.5	5.0	5.1	
Wholesale Price Index (WPI)		10.2	4.6	7.7	-1.9	
Foodstuff	(46.3%)	6.2	8.4	7.9	3.4	
Raw Materials	(12.3%)	23.0	-6.1	30.5	-22.7	
Fuels & Lighting	(9.3%)	13.7	6.7	-0.3	0.1	
Manufacturers	(28.0%)	7.1	2.4	3.3	-2.7	
Building Materials	(4.0%)	8.4	3.9	2.4	8.1	
Sensitive Price Index (SPI)		10.1	7.2	5.9	5.7	
GDP Deflator (Full Year)		9.7	5.6	-	-	
GNP Deflator (Full Year)		8.9	5.0	-	-	

Source: Federal Bureau of Statistics.

TABLE II-8

FOREIGN EXCHANGE RECEIPTS,
EXPENDITURES AND FINANCING

Particulars	(Million \$)			
	1981-82	1982-83	1983-84	1984-85 ^{1/}
EXPENDITURES	7744	7622	8292	8427
Imports (c.i.f)	6280	6105	6518	6775
Debt Service ^{2/}	908	845	991	963
(i) Interest	416	425	471	445
(ii) Principal	492	420	520	518
Others	556	672	783	689
RECEIPTS	5642	6644	6741	6274
Exports (f.o.b)	2319	2627	2669	2633
Workers' Remittances	2224	2886	2737	2450
Others	1099	1131	1335	1191
GAP (& FINANCING)	2102	978	1551	2153
Borrowing Long-term	1238	1662	1434	1530
Borrowing Short-term	274	-1	89	-
Change in Reserves	580	-698	86	623
(--increase)				
Errors & Omissions	10	15	33	-
<u>Memorandum:</u>				
Trade Gap (As % of GNP)	11.4	10.3	10.8	11.4
Balance on Current	5.3	1.9	3.4	5.2
Account (As % of GNP)	5.3	1.9	3.4	5.2

^{1/} Provisional.^{2/} Debt service figures reported in this table are inclusive of charges on IMF facility, etc.

Source: Finance Division.

II-4 WATER USERS ASSOCIATION AND WATER RIGHT

(1) The Role of Water Users association

In Pakistan, research and demonstration of water management have provided technological improvements in three areas; reduction of water conveyance and application losses, increase production from land levelling and improved agronomic practices and extension capabilities. These improvements are being made available through the On-Farm Water Management Program. Since the early 1970's the irrigation efficiency through watercourses at major irrigation areas of the country has been evaluated to identify the problems on irrigation and strategy of re-designing cum rehabilitation of watercourses as well as organization of Water Users Association. After 1981 when Water Users Association Act was promulgated in different provinces, several Water Users Associations were organized with help of Water Laws and Cooperative Farming Act.

(2) Water Right

1) Legal conditions of Water Rights

The water laws in Pakistan differ slightly from Province to Province and are in operation according to i) Canal and Drainage Act, 1973, ii) the Punjab Minor Canals Act, 1905, and iii) Punjab soil Reclamation Act, 1952.

In the irrigated area of the country, the water right is assessed by the Department of Irrigation for registration with the Department of Land Revenue based on the land holdings. This legal condition is operated in the irrigated area but not in the Barani area like rural area of ICT. In the study area, no governmental irrigation project exists except for those five irrigation cooperative societies recently organized but not as yet functioning.

Assistant Commissioner acts as coordinator between the beneficiaries and government functionaries regarding the water right. There are a few beneficiaries in the private sector as well as in government sector such as the agricultural research farm of NARC, Fish Hatchery and CDA's nursery nearby the Rawal Dam who are served by the Rawal Lake.

2) Customary Water Right

ICT is located in the Barani area with local streams extending from the hill catchment areas forming deep eroded valleys. Until recent years, most of the farmland was dependent upon the rain restricting water resource use for irrigation purposes due to topographical conditions, technological limitation and financial aspects. According to statements of concerned officials, there is no customary water right operating in the Barani area of ICT.

II-5 LIST OF ELECTED/OFFICIAL MEMBERS OF
RURAL AREAS COORDINATION COMMITTEE (RACC)

A) **ELECTED REPRESENTATIVES**

All Chairmen of Union Councils in Islamabad Capital Territory

B) **OFFICIAL MEMBERS**

- 1) Executive Engineer (Construction) WAPDA, Islamabad
- 2) Executive Engineer Pak.P.W.D. Central Civil Division No.5
Islamabad
- 3) Executive Engineer Project Civil Division No.1 Pak.P.W.D.
Islamabad
- 4) Executive Engineer Stores and Workshop Division Rawalpindi
- 5) Director Agriculture Extension T.T. Unit P.A.R.C. Islamabad
- 6) Assistant Commissioner ICT
- 7) Assistant Commissioner Rural
- 8) District Health Officer, ICT
- 9) District Food Controller, ICT
- 10) Circle Registrar, Cooperative Societies, ICT
- 11) Assistant Director Fisheries, ICT
- 12) Assistant Director Live Stock and Dairy Development, ICT
- 13) Extra Assistant Director Agriculture, Ict
- 14) Assistant Director Education
- 15) Assistant Director Local Government and Rural Development,
ICT
- 16) Deputy Director (Regional Planning) CDA, Islamabad.
- 17) Assistant Agricultural Engineer, Soil Conservation, ICT

CHAIRMAN RACC

SECRETARY

ASSITANT SECRETARY

1. STENO-TYPIST URDU :1
2. SUB ENGINEER :3
3. ACCOUNTS CLERK :1
4. JUNIOR CLERK :1
5. NAIB QASID :2

ORGANIZATIONAL CHART OF RURAL AREAS COORDINATION COMMITTEE, ISLAMABAD

II-6 CLASSIFICATION OF UNION COUNCILS AND THEIR DEMANDS

1. Classification of UCs

Islamabad rural area can be divided into three Markaz areas. However, the Markaz does not act as an administrative unit. For the formulation of the Project, therefore, eleven UCs in the rural area have been classified into four categories according to local characteristics including geographical, topographical and social conditions. The following table shows the four categories and their local characteristics.

Category	Local Situation	Average Farm Size	Name of UC
I	Due to close proximity, these UCs are highly influenced by the urban area.	2-4 ac	1. Sohan 2. Koral 3. Rawat
II	Located in the plain area, these UCs can be focal points for agricultural development.	5-6 ac	4. Tarlai 5. Kirpa 6. Sihala
III	Located between the flat area and mountainous areas, deployment of multifaceted development plans are anticipated.	3-4 ac	7. Charah 8. Bhara Kau 9. Phulgran
IV	Located in mountainous area, these UCs have a sense of joint responsibility and mutual cooperation. Local interest in the Master Plan is high.	1-2 ac	10. Tamair 11. Shah Allah Ditta

2. Farmers' Requirements

Based on the results of discussions with Panchayat members and progressive farmers from each UC and fact-finding surveys at each UC office, farmers' requirements for rural development were identified as outlined below.

(1) UC Sohan

- a) Processing and marketing facilities for vegetables, such as cold storage, dehydration plant, trucks with freezing equipment etc.

- b) Horticultural development farm and dairy farm (requested by progressive farmers)
- c) Establishment of small industries (matches, needles, soap, etc.) to create job opportunities for the unemployed and female labor force

(2) UC Koral

- a) Tractors for farming
- b) Tubewells for drinking water
- c) Construction of dams on the Kurang River or the Malal Kas to supply water for vegetable farming

(3) UC Rawat

- a) Agricultural machinery such as tractors, harvesters etc.
- b) Tubewells for irrigation to achieve increased production
- c) Electricity (mainly for tubewells)
- d) Water supply system
- e) Medical facilities
- f) Bulldozer for land levelling

(4) UC Tarlai

- a) Provision of an irrigation system suitable for vegetable farming, a source of increased income
- b) Provision of electricity for tubewells, etc.
- c) Construction of vocational training institutes and establishment of small industries to create job opportunities for the younger generation
- d) Provision of a rental system for mini-tractors, power tillers etc. to be rented to individual farmers for cultivation

(5) UC Kirpa

- a) Provision of irrigation water by construction of a mini-dam or weir on the Malal Kas
- b) Construction of roads
- c) Provision of agricultural machinery by a rental system
- d) Provision of electricity in unelectrified villages (about 50%)

- e) Vocational training institutions (e.g. mechanics, electronics, etc.) and small scale industries (e.g. matches, soap, electrical appliances, etc.) to create job opportunities in the area
- f) Provision of dairy cows imported from Australia which yield more milk than Pakistan cows
- g) Provision of hand pumps in existing wells to reduce heavy labor for women; provision of communal facilities such as communal washing place, etc. to be attached to existing wells

(6) UC Sihala

- a) Provision of irrigation facilities for vegetable farming
- b) Bulldozers for land levelling
- c) Electricity for tubewells
- d) Provision of agricultural machinery such as mini-tractors and threshers, etc.
- e) Provision of medical facilities
- f) Provision of technical training center (agricultural technology, carpentry, masonry, etc.)

(7) UC Charah

- a) Construction of a dam several kilometers upstream of the bridge on the Sohan River; construction of a weir on the Malal Kas for agricultural use
- b) Water supply facilities (tubewell plus water tank)
- c) Tractors (the Markaz office is too far for hiring agricultural machinery)
- d) Bulldozers for land levelling
- e) Construction of feeder roads connecting villages to market-to-farm roads
- f) Establishment of small scale industries such as matches, agricultural machinery spare parts, etc. (Farmers are willing to provide land for these industries)

(8) UC Bhara Kau

- a) Provision of a water supply system, construction of a link road (motorable road)
- b) Provision of medical facilities

- c) Provision of educational facilities (A vocational training center is necessary to train people in non-agricultural skills for jobs in the urban area)
- d) Provision of electricity

(9) UC Phulgran

- a) Provision of a water supply system
- b) Construction of a farm-to-market road
- c) Provision of educational facilities (training center for non-agricultural jobs)
- d) Provision of medical facilities (there is no medical doctor in the UC)
- e) Provision of veterinary hospital

(10) UC Tamair

- a) Job opportunities, particularly small industries
- b) Electric or hand pumps for irrigation
- c) Tractors and bulldozers for levelling and reclamation of common land

(11) UC Shah Allah Ditta

- a) Provision of a road, drinking water and electricity
- b) Provision of medical facilities (especially maternity center) to prevent death during or after delivery
- c) Educational facilities (especially for girls)
- d) Technical training center to create employment opportunities for young adults and enable them to work in foreign countries, horticultural technology is also required
- e) Construction of a bridge on the Nala Nilan
- f) Establishment of small industries (matches, cement, poultry farming, etc.)
- g) Provision of a community center in Shah Allah Ditta village and another between Gokina and Talhar

3. Development Potential of Each Union Council

Based on the results of the locality studies development potentials of each UC have been identified as follows:

(1) UC Sohan

- a) Horticultural pilot farm
- b) Planning of marketing facilities development schemes
- c) Irrigation operation and maintenance on a cooperative basis with provision of about 10 electric pumps

(2) UC Koral

- a) Pilot farm for small scale irrigation scheme
- b) Water resources development with provision of a collecting gallery in the river
- c) Water supply scheme using tubewells
- d) Range management for conservation

(3) UC Rawat

- a) Water supply system with tubewell
- b) Agricultural machinery hiring system
- c) Investigation of water resources in the area
- d) Marketing facilities

(4) UC Tarlai

- a) Identification of several project sites for an intensive irrigation scheme aimed mainly at vegetable farming
- b) Provision of an agricultural machinery station at the Tarlahi Markaz site to enable farmers to use mini-tractors
- c) Identification of a project site for a small scale irrigation scheme

(5) UC Kirpa

- a) Water resources development for a small scale irrigation scheme
- b) Water supply scheme and construction of farm-to-market road
- c) Provision of hand pumps to existing wells. In addition, communal facilities should be attached to the wells as a gathering place for women

(6) UC Sihala

- a) Planning of an intensive agricultural development scheme through small irrigation development
- b) Introduction of small scale industries
- c) Provision of open well (approximate dia: 5m) along the Sohan River for multipurpose utilization of water resources
- d) Construction of a mini-reservoir and land levelling for range land in the northern part of the Sohan River which would contribute to land conservation

(7) UC Charah

- a) A feasibility study on the prospective dam site on the Sohan River identified during the Study
- b) Planning the establishment of a rural development station

(8) UC Bhara Kau

- a) Mini-hydropower generation for rural electrification
- b) Establishment of a rural development station
- c) Provision of open wells for drinking water

(9) UC Phulgran

- a) Establishment of rural development station
- b) Provision of multipurpose open wells
- c) Establishment of vocational training center(s)

(10) UC Tamair

- a) Small scale irrigation scheme
- b) Livestock and pasture development scheme
- c) Rural development supporting services scheme

(11) UC Shah Allah Ditta

- a) Establishment of multipurpose community center including rural development supporting services
- b) Development of recreation facilities such as holiday resorts and resort farms
- c) Water resources development plan of the Nala Nilan including construction of sabo dam, embankment, conservation of gallery, bridges, etc.