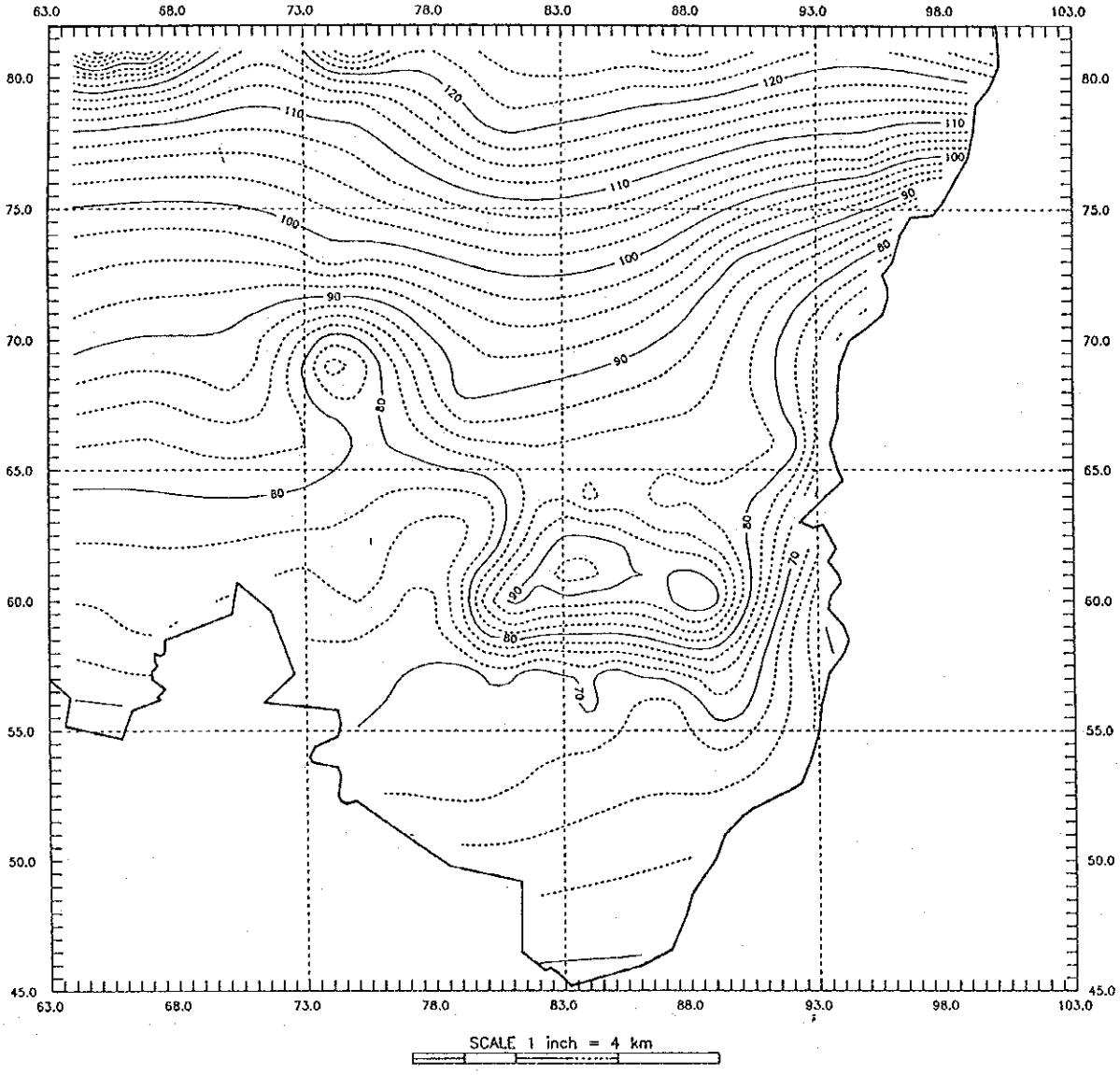
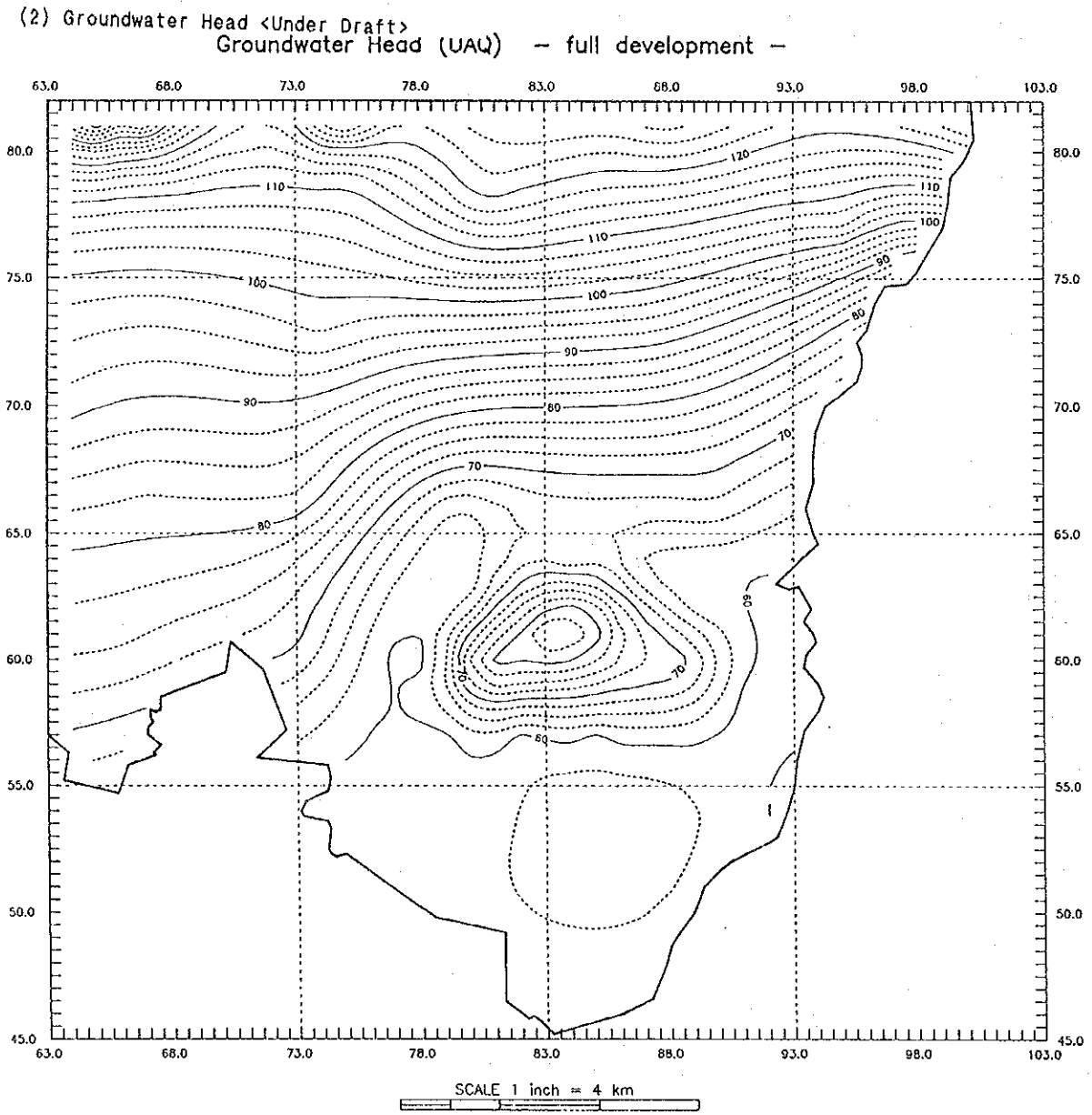
4.5.4. Groundwater Head Contour Map

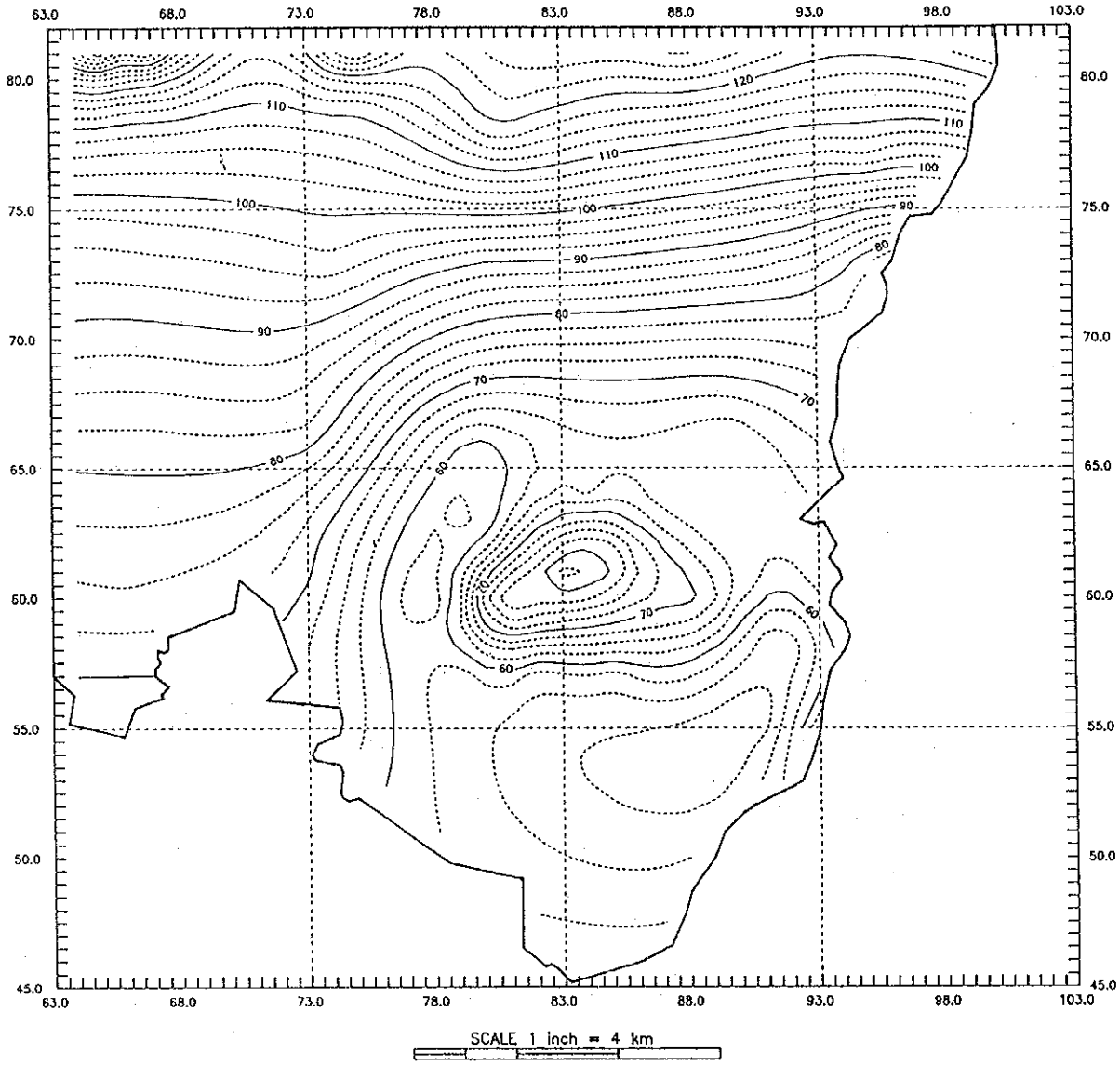
Groundwater Head (UAQ) (1) Groundwater Head <Present Condition>



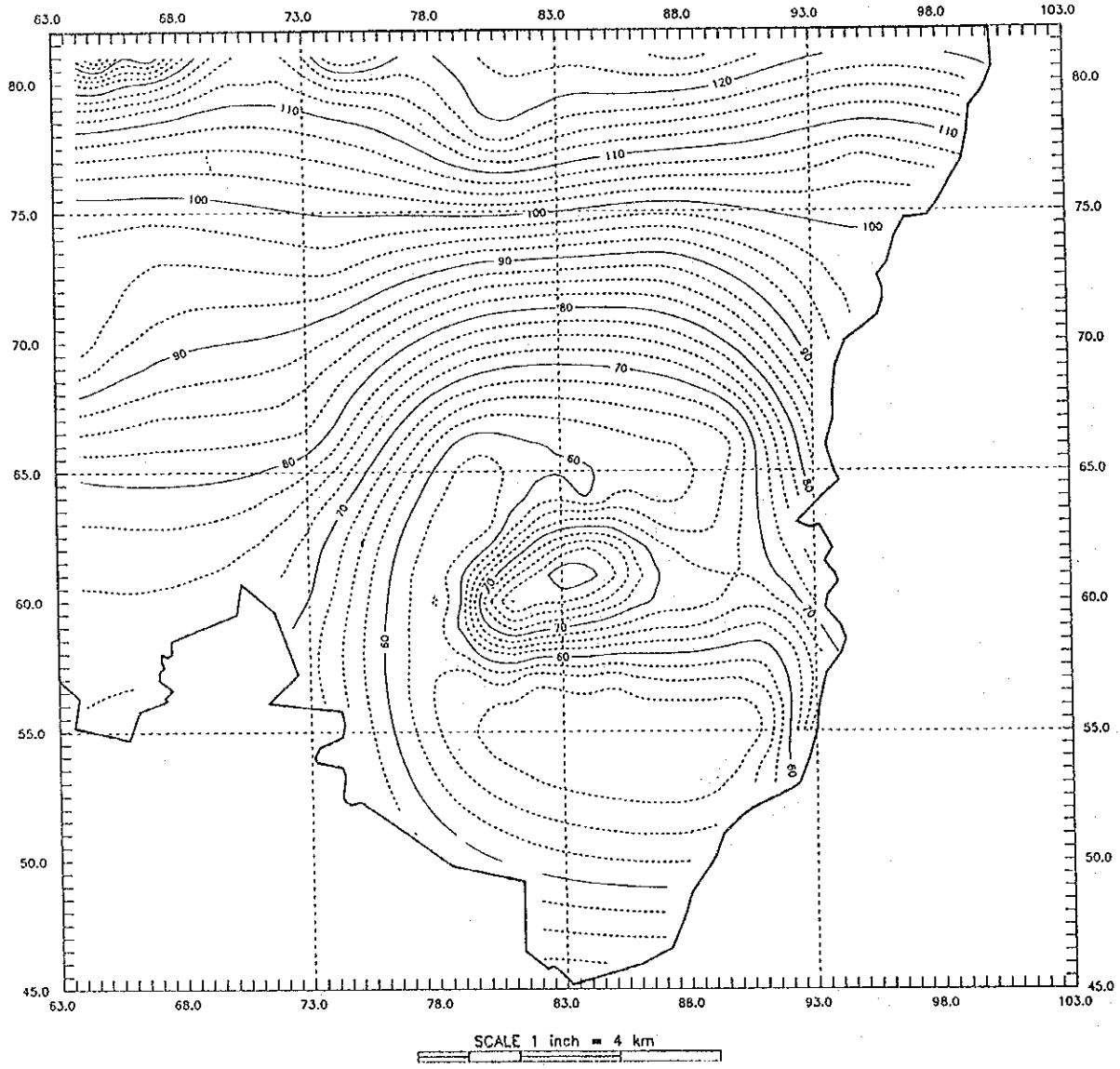
(2) Groundwater Head <Under Draft>



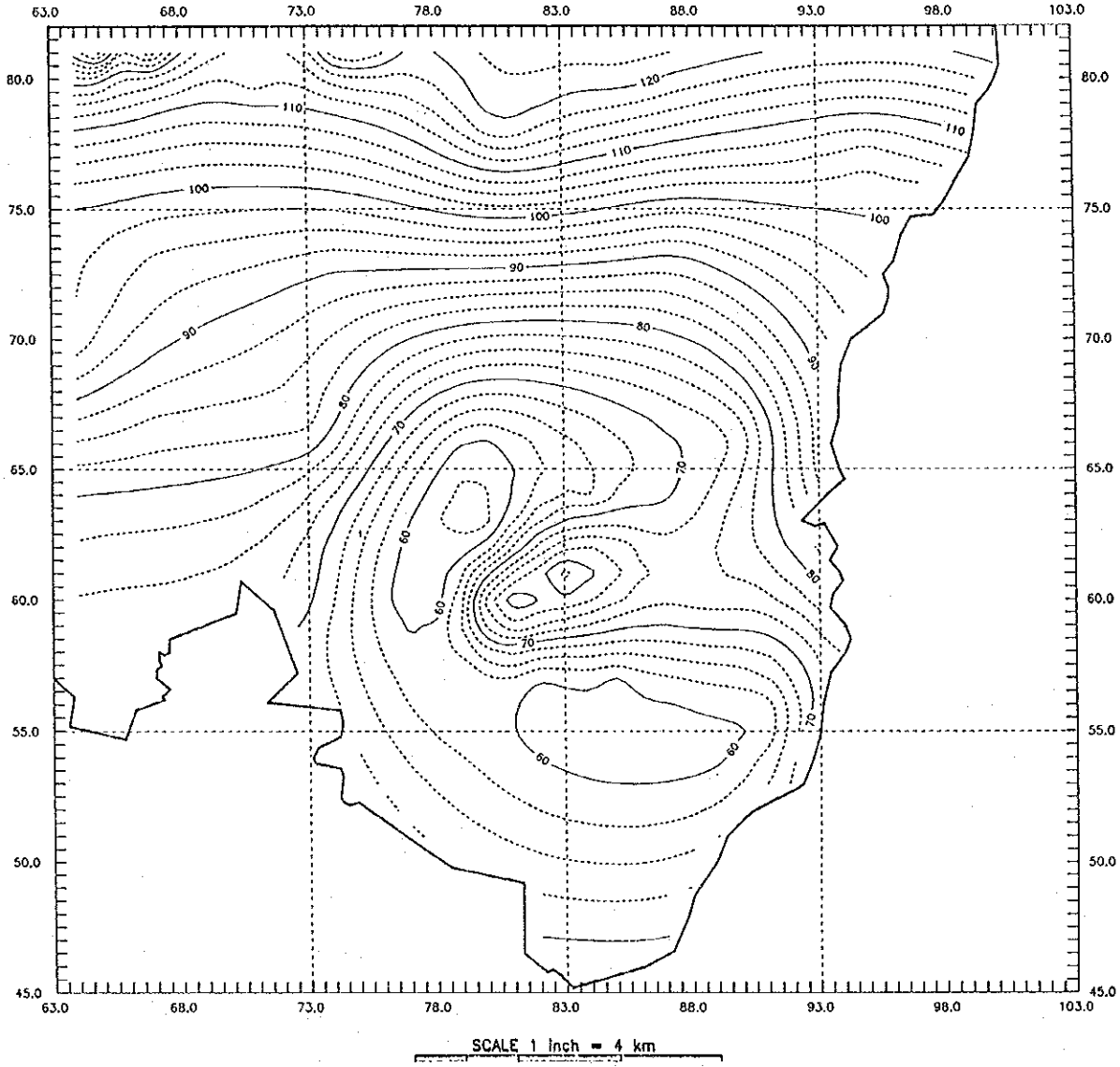
Groundwater Head (AQ1) – full development –



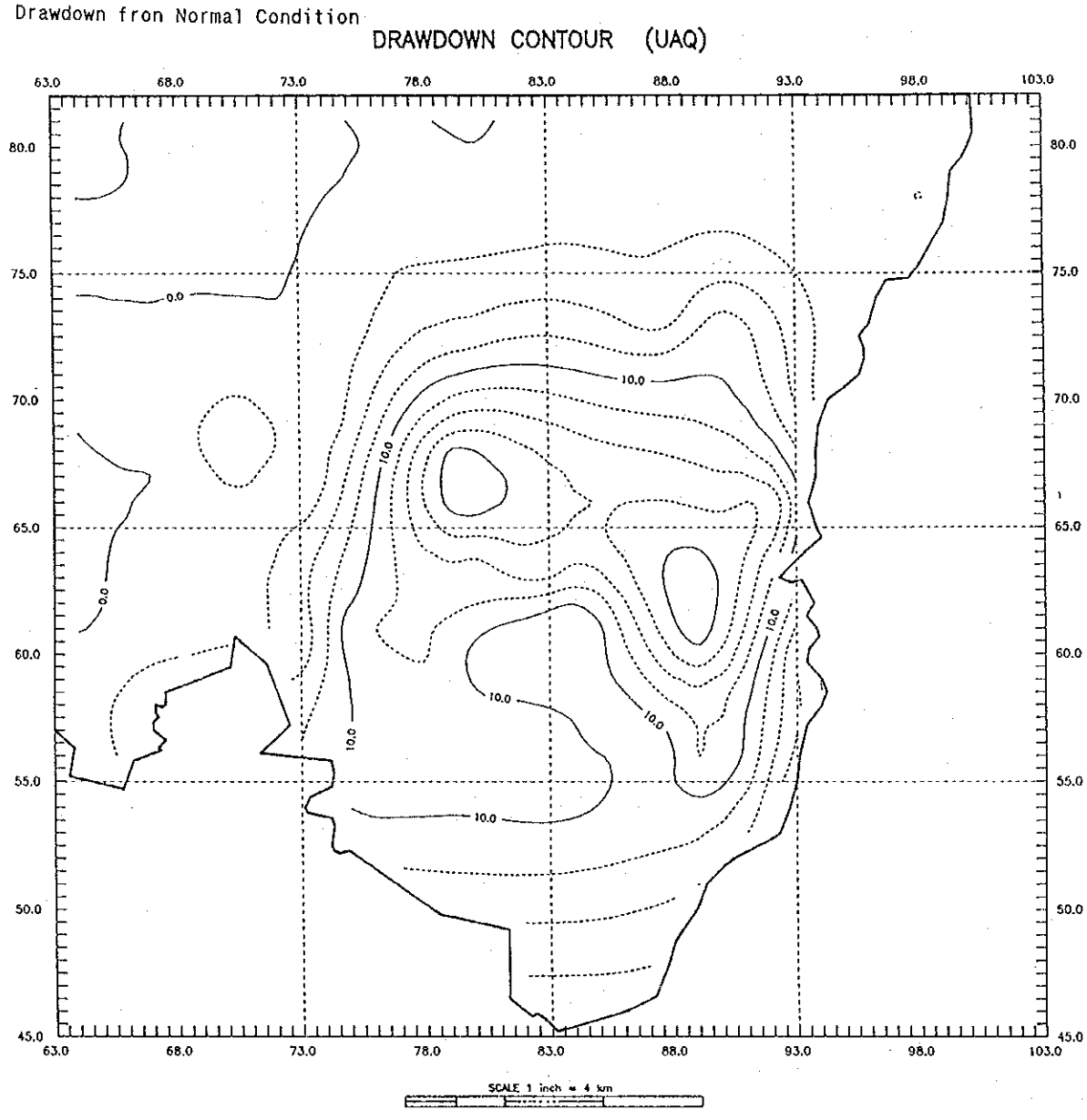
Groundwater Head (AQ2) – full development –



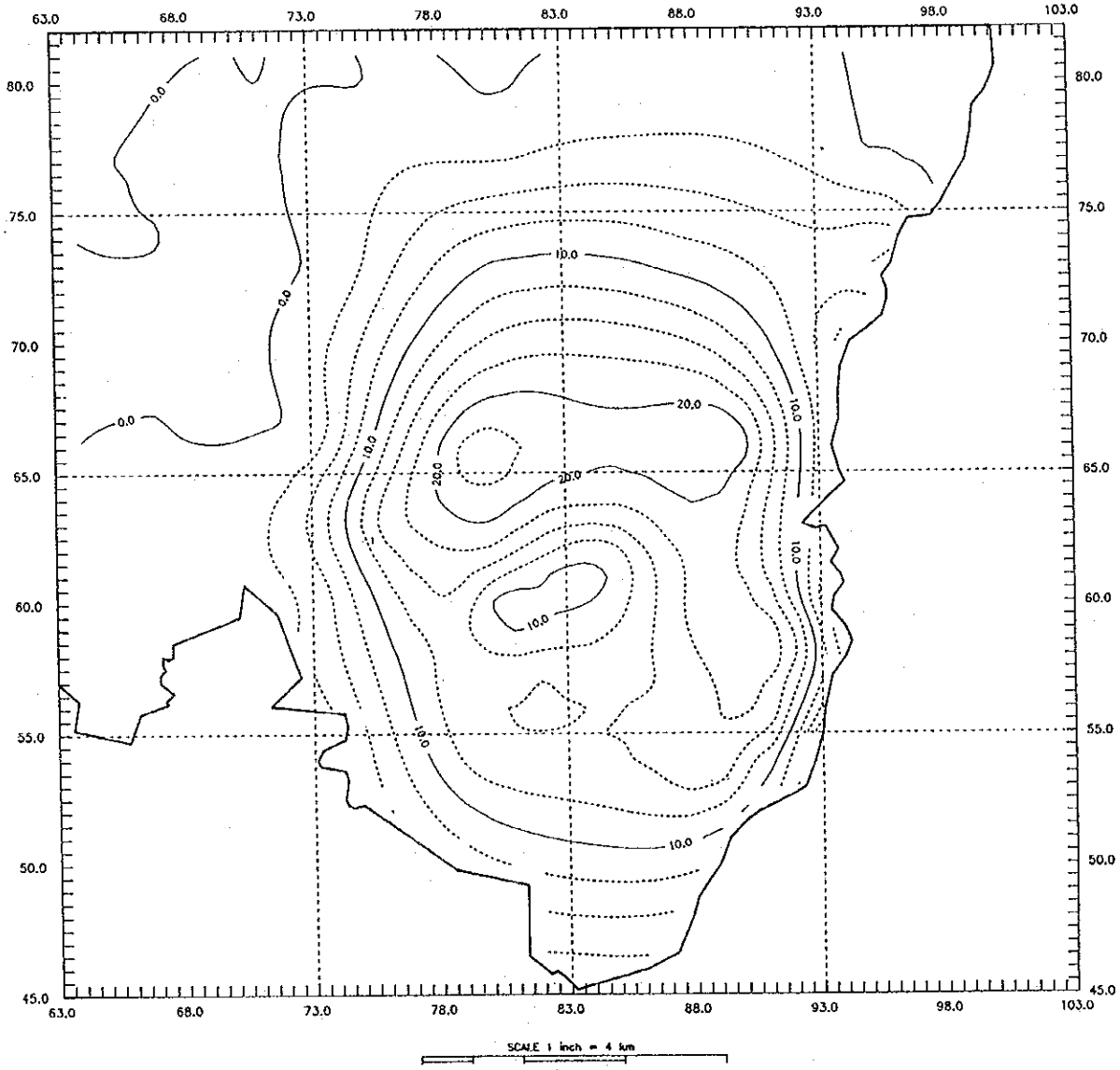
Groundwater Head (Siwalik) – full development –



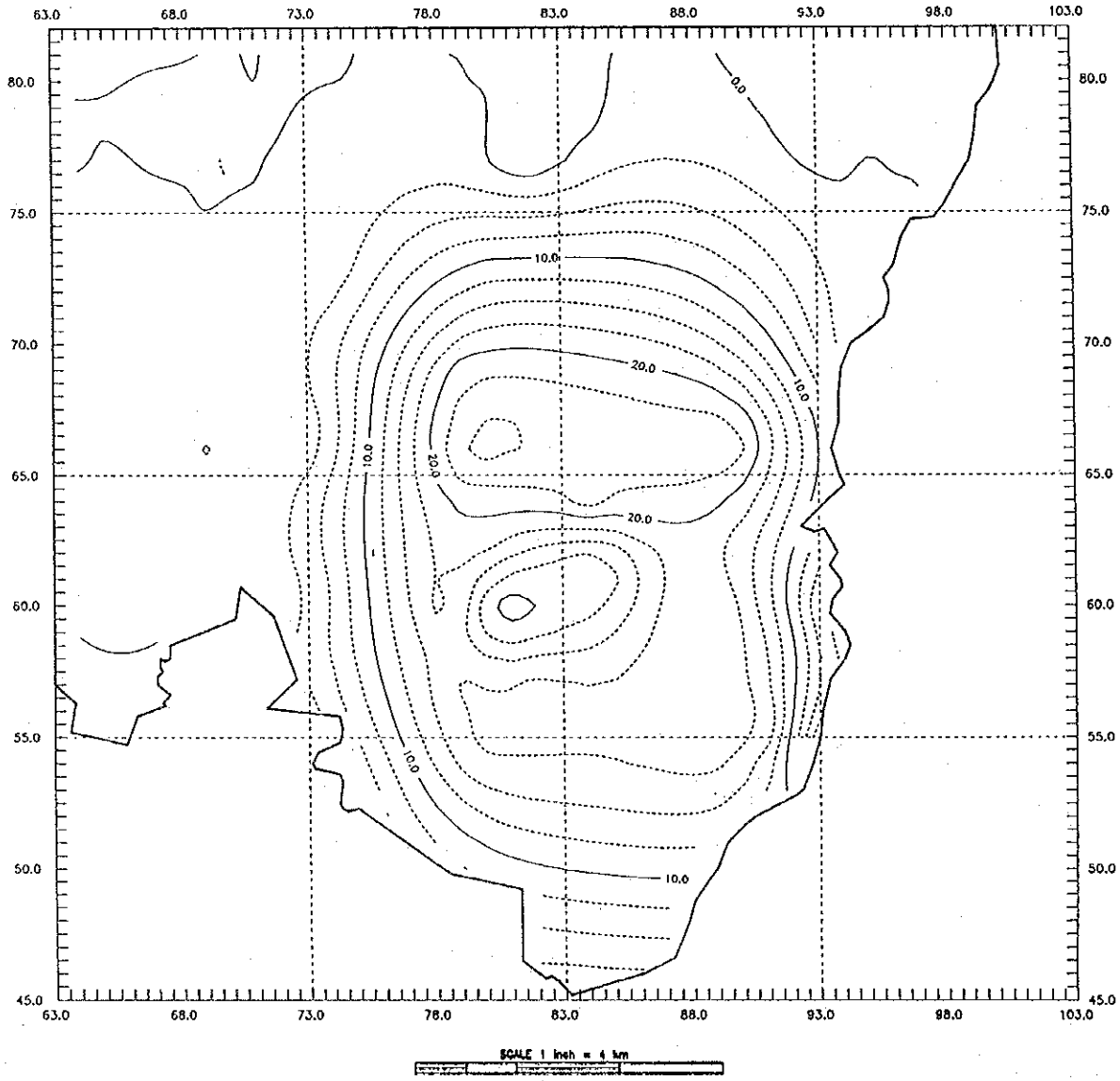
(3) Drawdown fron Normal Condition



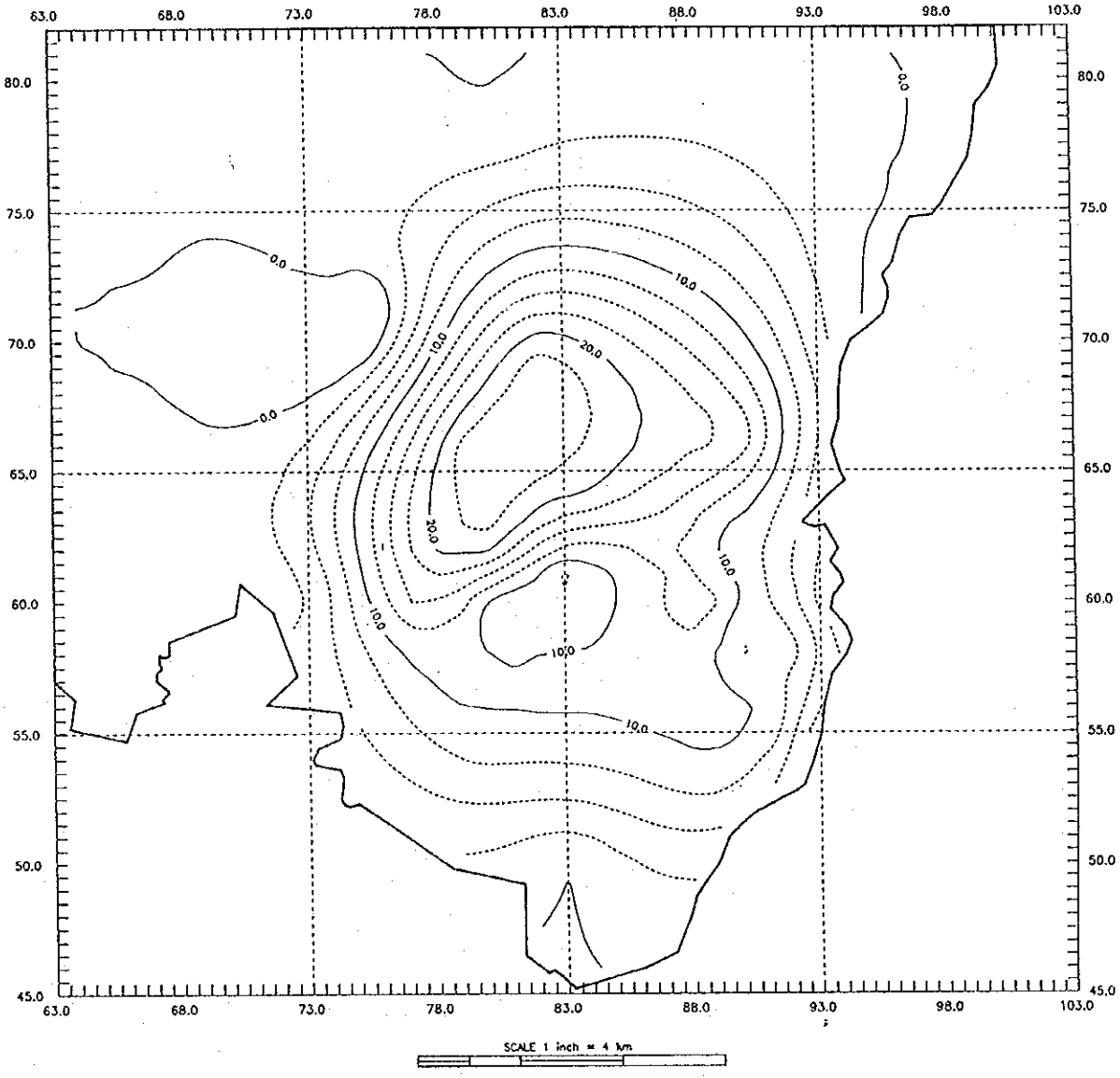
DRAWDOWN CONTOUR (AQ1)



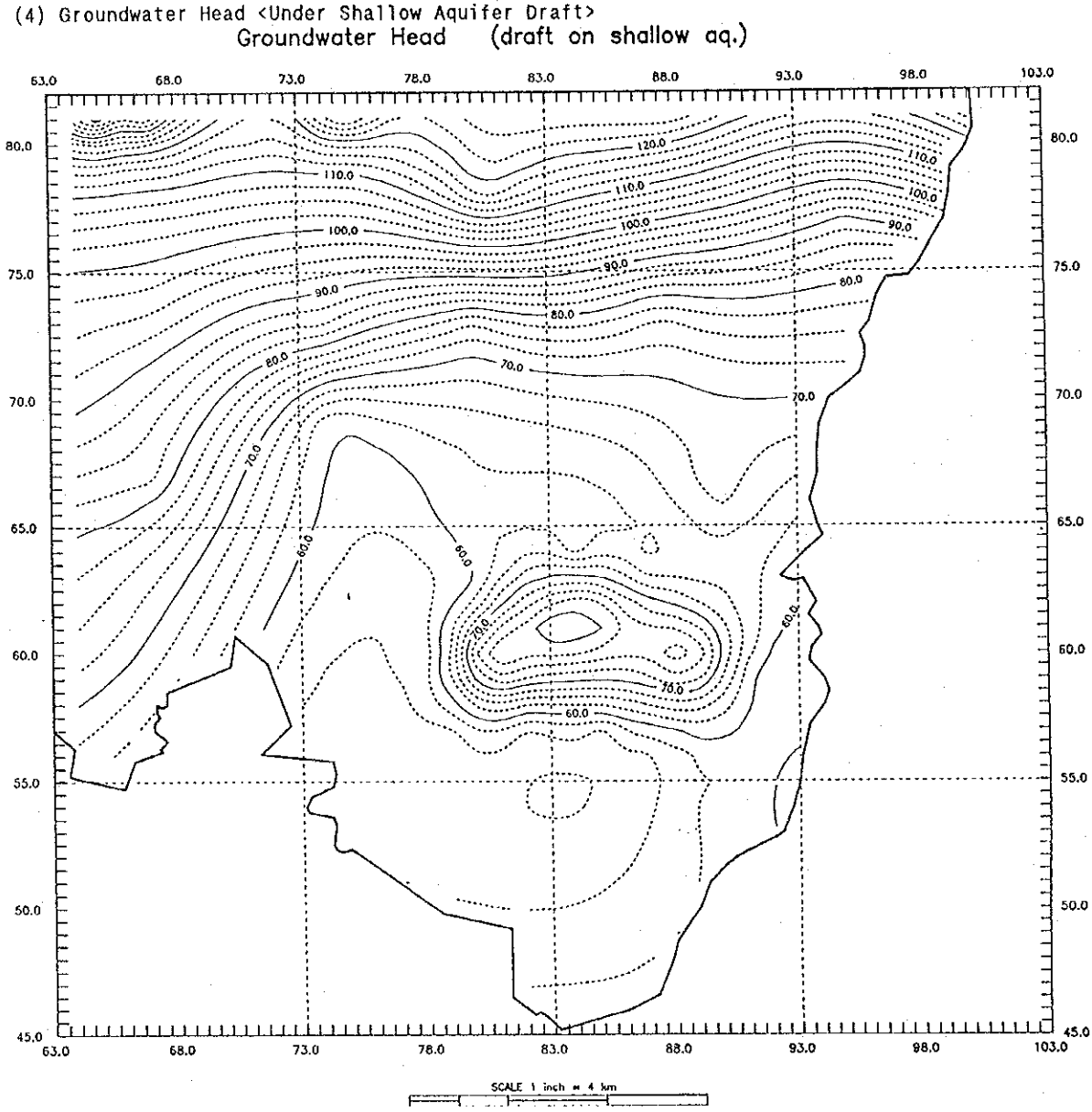
DRAWDOWN CONTOUR (AQ2)



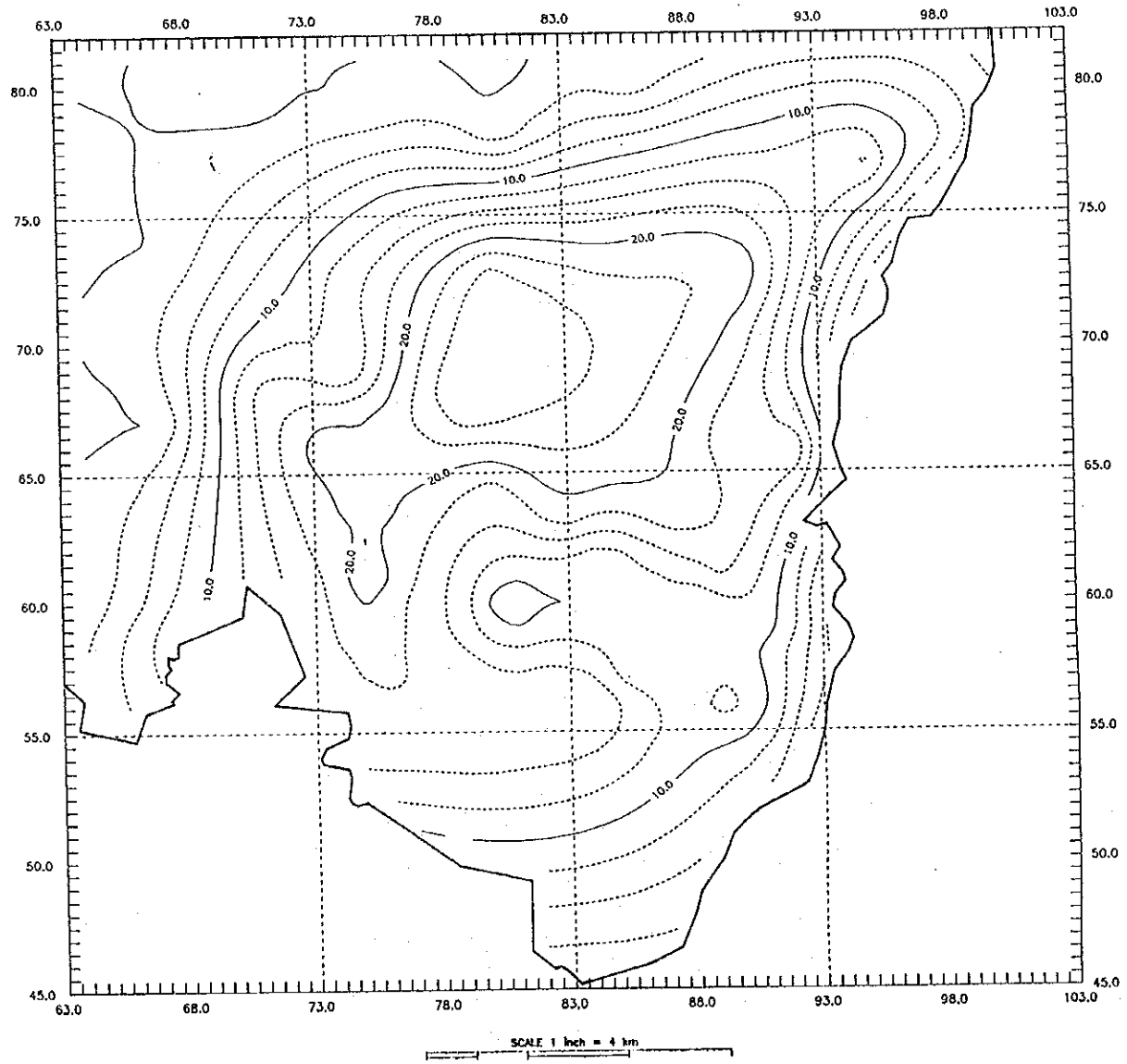
DRAWDOWN CONTOUR (Churia aq.)



(4) Groundwater Head <Under Shallow Aquifer Draft>



DRAWDOWN (draft on shallow aq.)



4.5.5. Summary of Hydrologic Balance (for 14 years) (1) Present Situation

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1980
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3689.2	.0	1025.4	2691.3	.0	.0	.0
2	5.2	13.6	.0	3.7	9.9	.0	.0	.0
3	160.4	459.1	.0	116.7	342.6	.3	.0	.0
4	66.5	190.4	.0	48.4	141.9	.1	.0	.0
5	59.0	153.5	342.6	50.7	431.4	15.2	12.3	.0
6	20.1	52.4	.0	15.8	26.2	10.7	11.2	.0
7	111.1	289.1	141.9	91.7	297.8	44.9	40.5	.0
8	48.4	125.8	2691.3	53.9	2744.1	11.7	11.6	.0
9	56.5	147.0	441.2	46.5	529.2	12.6	12.0	.0
10	41.3	107.5	.0	32.1	65.3	10.1	9.0	.0
11	28.8	74.8	26.2	22.3	72.7	6.0	6.5	.0
12	48.8	127.0	297.8	40.9	381.9	2.1	1.8	.1
13	41.3	107.5	2744.1	46.0	2797.7	7.6	7.4	.0
14	37.8	98.4	529.2	31.6	585.3	11.1	10.1	.0
15	37.4	97.3	65.3	29.3	127.4	5.9	4.6	.1
16	66.7	173.7	72.7	54.5	182.0	8.4	5.6	.5
17	51.8	134.7	381.9	41.1	439.4	36.2	35.7	.0
18	44.6	116.2	2797.7	49.7	2850.8	11.4	11.3	.0
19	28.0	72.9	585.3	23.6	629.8	4.8	.9	.1
20	38.8	100.8	127.4	30.7	183.1	14.4	13.7	.3
21	59.6	155.2	182.0	50.5	237.3	62.4	55.3	.8
22	16.9	44.1	.0	12.2	28.8	3.0	2.9	.0
23	40.3	104.9	.0	28.8	63.5	12.6	14.0	.1
24	55.3	143.9	2850.8	60.6	2917.1	7.5	4.6	.0
25	39.3	102.3	629.9	33.5	689.5	10.3	10.0	.0
26	72.2	187.7	211.9	56.9	280.6	63.6	63.8	.2
27	54.7	142.2	63.5	43.7	152.9	9.4	8.1	.1
TOTAL	2512.4	7211.2	15182.8	2140.5	19899.5	382.3	353.2	2.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1981
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3615.5	.0	931.8	2743.4	.0	.0	.0
2	5.2	13.3	.0	3.0	10.3	.0	.0	.0
3	160.4	449.9	.0	97.3	352.6	.3	.0	.0
4	66.5	186.6	.0	40.3	146.2	.1	.0	.0
5	59.0	150.4	352.6	47.0	443.7	12.3	14.1	.0
6	20.1	51.4	.0	14.0	29.5	7.9	8.2	.0
7	111.1	283.3	146.2	82.4	314.5	32.6	35.8	.0
8	48.4	123.3	2743.4	52.8	2802.5	12.2	12.1	.0
9	56.5	144.1	454.0	41.4	546.8	9.9	10.7	.0
10	41.3	105.4	.0	27.6	69.9	7.9	8.6	.0
11	28.8	73.3	29.5	19.5	78.6	4.7	4.9	.0
12	48.8	124.5	314.5	37.7	399.6	1.7	2.2	.1
13	41.3	105.3	2802.5	45.1	2855.0	8.2	8.4	.0
14	37.8	96.4	546.8	28.6	605.4	9.3	9.8	.0
15	37.4	95.4	69.9	25.4	135.5	4.4	4.9	.1
16	66.7	170.2	78.6	52.4	189.5	7.8	8.8	.5
17	51.8	132.0	399.6	36.6	466.0	29.1	29.6	.0
18	44.6	113.9	2855.0	48.8	2907.5	13.1	13.1	.0
19	28.0	71.4	605.4	21.7	650.9	4.2	.1	.1
20	38.8	98.8	135.5	28.0	194.9	11.4	11.6	.3
21	59.6	152.1	189.5	49.7	250.1	43.7	43.6	.8
22	16.9	43.2	.0	10.2	30.6	2.4	2.9	.0
23	40.3	102.8	.0	23.7	67.8	11.3	11.8	.1
24	55.3	141.0	2907.5	60.4	2979.7	9.0	4.2	.0
25	39.3	100.2	651.0	30.5	712.1	8.6	9.2	.0
26	72.2	184.0	225.5	50.8	310.5	48.2	48.6	.2
27	54.7	139.4	67.8	39.1	161.3	6.8	7.6	.1
TOTAL	2512.4	7067.1	15574.9	1945.9	20454.5	306.7	311.0	2.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1982
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	4057.9	.0	883.5	3152.8	.0	.0	.0
2	5.2	15.0	.0	2.9	12.0	.0	.0	.0
3	160.4	504.9	.0	92.8	411.6	.3	.0	.0
4	66.5	209.5	.0	38.5	170.9	.1	.0	.0
5	59.0	168.8	411.6	44.2	523.2	13.1	12.8	.0
6	20.1	57.6	.0	13.4	35.5	8.8	8.7	.0
7	111.1	318.0	170.9	77.6	376.7	34.7	33.8	.0
8	48.4	138.4	3152.8	52.0	3225.7	13.3	12.3	.0
9	56.5	161.7	535.2	39.8	646.3	10.8	10.5	.0
10	41.3	118.3	.0	26.1	83.9	8.3	8.3	.0
11	28.8	82.3	35.5	18.9	93.8	5.0	5.0	.0
12	48.8	139.7	376.7	35.8	478.7	1.9	1.7	.1
13	41.3	118.2	3225.7	44.4	3290.6	8.8	8.3	.0
14	37.8	108.2	646.3	27.1	717.1	10.2	9.9	.0
15	37.4	107.1	83.9	24.0	162.5	4.4	4.2	.1
16	66.7	191.0	93.8	48.7	227.4	8.7	7.4	.5
17	51.8	148.2	478.7	35.7	557.3	33.8	33.6	.0
18	44.6	127.8	3290.6	48.0	3356.3	13.9	13.5	.0
19	28.0	80.2	717.1	20.6	772.0	4.8	1.1	.1
20	38.8	110.9	162.5	26.8	234.2	12.5	12.1	.3
21	59.6	170.7	227.4	45.1	297.2	55.1	53.9	.8
22	16.9	48.5	.0	9.8	36.2	2.5	2.7	.0
23	40.3	115.4	.0	22.2	80.9	12.3	12.4	.1
24	55.3	158.3	3356.3	58.3	3446.7	9.4	4.0	.0
25	39.3	112.5	772.1	29.0	845.6	9.9	9.7	.0
26	72.2	206.5	270.4	49.4	371.8	55.7	55.3	.2
27	54.7	156.4	80.9	36.9	193.3	7.0	6.8	.1
TOTAL	2512.4	7931.8	18088.3	1851.4	23800.1	345.0	327.9	2.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1983
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3551.7	.0	937.3	2593.1	.0	.0	.0
2	5.2	13.1	.0	3.4	9.6	.0	.0	.0
3	160.4	441.9	.0	106.3	334.2	.3	.0	.0
4	66.5	183.3	.0	44.1	138.7	.1	.0	.0
5	59.0	147.8	334.2	46.2	422.2	13.1	13.3	.0
6	20.1	50.5	.0	14.7	24.6	11.0	11.0	.0
7	111.1	278.3	138.7	83.3	291.6	41.5	41.1	.0
8	48.4	121.2	2593.1	53.2	2649.0	11.7	11.7	.0
9	56.5	141.6	431.9	42.6	519.4	11.2	11.1	.0
10	41.3	103.5	.0	29.2	64.6	9.5	9.2	.0
11	28.8	72.0	24.6	20.8	70.0	5.7	5.6	.0
12	48.8	122.3	291.6	37.8	374.0	1.8	1.7	.1
13	41.3	103.4	2649.0	45.5	2698.9	7.9	7.8	.0
14	37.8	94.7	519.4	29.0	574.9	10.0	9.9	.0
15	37.4	93.7	64.6	26.8	125.9	5.4	5.0	.1
16	66.7	167.2	70.0	53.0	174.7	9.2	8.4	.5
17	51.8	129.7	374.0	38.7	427.0	37.7	37.6	.0
18	44.6	111.8	2698.9	49.2	2748.7	12.6	12.6	.0
19	28.0	70.2	574.9	21.8	618.7	4.4	2.6	.1
20	38.8	97.1	125.9	29.0	179.3	14.5	14.1	.3
21	59.6	149.4	174.7	49.2	216.9	57.4	56.6	.8
22	16.9	42.4	.0	11.3	28.3	2.8	2.6	.0
23	40.3	101.0	.0	26.0	62.8	12.1	11.9	.1
24	55.3	138.5	2748.7	59.7	2818.7	8.4	8.0	.0
25	39.3	98.4	618.7	30.7	676.9	9.4	9.3	.0
26	72.2	180.7	207.5	53.7	268.2	66.1	65.6	.2
27	54.7	136.9	62.8	39.8	151.2	8.4	8.2	.1
TOTAL	2512.4	6942.4	14703.3	1982.1	19262.2	372.1	364.9	2.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1984
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	5070.2	.0	981.6	4074.8	.0	.0	.0
2	5.2	18.7	.0	3.6	15.1	.0	.0	.0
3	160.4	630.9	.0	113.6	517.9	.3	.0	.0
4	66.5	261.7	.0	47.1	215.0	.1	.0	.0
5	59.0	210.9	517.9	49.9	662.6	16.7	15.1	.0
6	20.1	72.0	.0	15.4	45.0	11.8	11.7	.0
7	111.1	397.3	215.0	88.2	479.7	45.0	44.3	.0
8	48.4	173.0	4074.8	53.2	4178.6	15.8	13.6	.0
9	56.5	202.1	677.8	44.9	821.6	13.7	13.4	.0
10	41.3	147.8	.0	31.3	105.5	11.2	10.9	.0
11	28.8	102.8	45.0	21.9	119.3	6.7	6.7	.0
12	48.8	174.6	479.7	39.8	612.5	2.2	2.0	.1
13	41.3	147.7	4178.6	45.4	4270.5	10.3	9.0	.0
14	37.8	135.2	821.6	30.2	914.2	12.5	10.6	.0
15	37.4	133.8	105.5	28.6	204.7	6.2	5.6	.1
16	66.7	238.7	119.3	54.9	293.1	9.8	8.5	.5
17	51.8	185.1	612.5	40.4	714.5	43.0	40.2	.0
18	44.6	159.7	4270.5	49.1	4365.1	15.9	14.4	.0
19	28.0	100.2	914.3	22.8	986.2	5.7	.3	.1
20	38.8	138.6	204.7	30.0	298.1	15.4	14.9	.3
21	59.6	213.3	293.2	50.8	388.4	66.8	65.6	.8
22	16.9	60.6	.0	11.9	45.5	3.2	2.8	.0
23	40.3	144.2	.0	27.6	100.9	15.8	14.9	.1
24	55.3	197.8	4365.2	59.6	4491.8	11.6	5.9	.0
25	39.3	140.5	986.3	32.0	1083.7	11.3	10.8	.0
26	72.2	258.0	343.6	55.1	476.8	70.0	69.1	.2
27	54.7	195.4	100.9	42.5	244.7	9.4	9.2	.1
TOTAL	2512.4	9910.6	23326.3	2071.4	30725.9	430.5	399.5	2.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1985
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	4151.5	.0	1009.0	3069.8	.0	.0	.0
2	5.2	15.3	.0	3.9	11.3	.0	.0	.0
3	160.4	516.6	.0	121.6	391.4	.3	.0	.0
4	66.5	214.3	.0	50.4	162.5	.1	.0	.0
5	59.0	172.7	391.4	51.6	493.3	15.9	15.6	.0
6	20.1	59.0	.0	16.3	29.7	12.5	12.3	.0
7	111.1	325.3	162.5	92.2	344.4	47.6	46.2	.0
8	48.4	141.6	3069.8	53.8	3143.9	13.1	12.9	.0
9	56.5	165.5	504.7	47.2	608.2	13.1	12.7	.0
10	41.3	121.0	.0	32.8	76.0	11.1	10.8	.0
11	28.8	84.2	29.7	23.2	83.3	6.7	6.6	.0
12	48.8	142.9	344.4	41.8	442.0	2.2	1.9	.1
13	41.3	120.9	3143.9	45.9	3209.7	8.7	8.7	.0
14	37.8	110.7	608.2	31.7	674.5	11.6	11.3	.0
15	37.4	109.5	76.0	30.0	148.0	6.5	6.1	.1
16	66.7	195.4	83.3	56.3	209.0	9.9	8.7	.5
17	51.8	151.6	442.0	42.6	508.2	41.4	40.8	.0
18	44.6	130.7	3209.7	49.7	3276.2	13.8	13.7	.0
19	28.0	82.0	674.5	23.8	726.8	5.1	.5	.1
20	38.8	113.5	148.0	31.8	212.3	16.4	15.9	.3
21	59.6	174.6	209.0	52.0	265.4	62.8	61.7	.8
22	16.9	49.6	.0	12.7	33.4	3.2	3.0	.0
23	40.3	118.0	.0	29.9	73.4	14.0	13.9	.1
24	55.3	161.9	3276.2	60.8	3366.9	9.5	6.8	.0
25	39.3	115.1	726.9	33.4	796.4	10.9	10.6	.0
26	72.2	211.3	245.6	58.8	320.2	75.9	75.2	.2
27	54.7	160.0	73.4	44.7	177.4	9.7	9.3	.1
TOTAL	2512.4	8114.7	17419.3	2148.0	22853.8	422.0	405.0	2.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1986
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	2485.5	.0	909.3	1681.4	.0	.0	.0
2	5.2	9.2	.0	3.2	6.0	.0	.0	.0
3	160.4	309.3	.0	101.6	210.8	.3	.0	.0
4	66.5	128.3	.0	42.1	87.5	.1	.0	.0
5	59.0	103.4	210.8	45.7	258.3	13.4	14.8	.0
6	20.1	35.3	.0	14.1	13.4	8.4	8.6	.0
7	111.1	194.8	87.5	80.9	165.6	39.3	41.4	.0
8	48.4	84.8	1681.4	52.2	1705.9	9.2	9.4	.0
9	56.5	99.1	264.4	41.4	312.8	10.9	11.4	.0
10	41.3	72.4	.0	28.7	37.2	7.5	8.2	.0
11	28.8	50.4	13.4	20.0	39.3	5.3	5.5	.0
12	48.8	85.6	165.6	36.9	213.9	1.8	2.1	.1
13	41.3	72.4	1705.9	44.5	1728.1	6.5	6.7	.0
14	37.8	66.3	312.8	28.0	343.1	9.0	9.5	.0
15	37.4	65.6	37.2	26.4	72.2	5.3	5.7	.1
16	66.7	117.0	39.3	51.4	99.4	9.4	10.1	.5
17	51.8	90.7	213.9	37.4	241.0	27.6	28.1	.0
18	44.6	78.3	1728.1	48.1	1748.5	10.7	10.9	.0
19	28.0	49.1	343.1	21.1	368.0	3.9	2.8	.1
20	38.8	67.9	72.2	27.6	100.4	13.1	13.3	.3
21	59.6	104.6	99.4	47.3	117.6	43.7	43.6	.8
22	16.9	29.7	.0	10.6	17.5	2.0	2.7	.0
23	40.3	70.7	.0	24.9	37.6	8.7	9.8	.1
24	55.3	96.9	1748.5	59.3	1780.9	6.5	6.9	.0
25	39.3	68.9	368.1	29.7	400.0	8.6	9.0	.0
26	72.2	126.5	117.8	50.7	144.2	51.4	51.9	.2
27	54.7	95.8	37.8	39.0	87.9	8.3	8.7	.1
TOTAL	2512.4	4858.3	9247.1	1921.9	12018.6	310.9	321.2	2.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1987
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	2736.5	.0	933.4	1805.0	.0	.0	.0
2	5.2	10.1	.0	3.5	6.6	.0	.0	.0
3	160.4	340.5	.0	111.3	228.9	.3	.0	.0
4	66.5	141.3	.0	46.1	95.1	.1	.0	.0
5	59.0	113.8	228.9	46.7	284.0	12.0	12.0	.0
6	20.1	38.9	.0	14.5	15.9	8.5	8.4	.0
7	111.1	214.4	95.1	82.8	189.9	36.8	36.3	.0
8	48.4	93.3	1805.0	52.3	1836.5	9.6	9.6	.0
9	56.5	109.1	290.5	42.5	347.0	10.1	9.9	.0
10	41.3	79.7	.0	29.8	41.9	8.0	7.9	.0
11	28.8	55.5	15.9	20.7	45.7	5.1	5.1	.0
12	48.8	94.2	189.9	37.4	245.1	1.7	1.5	.1
13	41.3	79.7	1836.5	44.7	1865.0	6.6	6.6	.0
14	37.8	73.0	347.0	28.8	382.6	8.6	8.5	.0
15	37.4	72.2	41.9	27.2	81.8	5.1	5.0	.1
16	66.7	128.8	45.7	50.8	116.1	7.6	7.1	.5
17	51.8	99.9	245.1	38.3	279.0	27.7	27.6	.0
18	44.6	86.2	1865.0	48.3	1892.1	10.8	10.8	.0
19	28.0	54.1	382.6	21.7	411.3	3.8	2.8	.1
20	38.8	74.8	81.8	28.2	116.3	12.1	11.8	.3
21	59.6	115.1	116.1	46.7	141.7	42.6	41.8	.8
22	16.9	32.7	.0	11.5	18.9	2.3	2.5	.0
23	40.3	77.8	.0	27.1	41.1	9.7	9.5	.1
24	55.3	106.7	1892.1	58.3	1934.1	6.5	5.9	.0
25	39.3	75.8	411.3	30.5	448.4	8.2	8.1	.0
26	72.2	139.3	135.1	51.8	172.9	49.6	49.4	.2
27	54.7	105.5	41.1	40.5	98.1	7.9	7.6	.1
TOTAL	2512.4	5348.8	10066.6	1975.2	13140.8	301.2	295.8	2.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1988
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3397.2	.0	1092.8	2286.4	.0	.0	.0
2	5.2	12.5	.0	3.8	8.7	.0	.0	.0
3	160.4	422.7	.0	118.5	303.9	.3	.0	.0
4	66.5	175.4	.0	49.1	126.2	.1	.0	.0
5	59.0	141.3	303.9	56.5	372.0	16.8	16.6	.0
6	20.1	48.3	.0	17.1	20.2	11.0	11.0	.0
7	111.1	266.2	126.2	99.5	244.0	48.8	49.6	.0
8	48.4	115.9	2286.4	52.3	2338.9	10.9	10.9	.0
9	56.5	135.4	380.7	51.6	451.0	13.5	13.5	.0
10	41.3	99.0	.0	34.6	54.2	10.2	10.1	.0
11	28.8	68.9	20.2	24.3	57.9	6.9	6.9	.0
12	48.8	117.0	244.0	45.2	313.5	2.3	2.3	.1
13	41.3	98.9	2338.9	44.6	2385.6	7.5	7.4	.0
14	37.8	90.6	451.0	35.1	495.0	11.5	11.5	.0
15	37.4	89.6	54.2	31.9	105.1	6.7	6.6	.1
16	66.7	159.9	57.9	60.9	146.0	10.7	9.9	.5
17	51.8	124.0	313.5	45.0	356.7	35.8	35.9	.0
18	44.6	107.0	2385.6	48.2	2432.0	12.2	12.1	.0
19	28.0	67.1	495.0	26.4	530.7	5.0	1.7	.1
20	38.8	92.8	105.1	33.5	147.8	16.6	16.4	.3
21	59.6	142.9	146.0	55.9	179.3	53.6	52.7	.8
22	16.9	40.6	.0	12.6	25.3	2.7	2.5	.0
23	40.3	96.6	.0	29.1	55.1	12.4	11.8	.1
24	55.3	132.5	2432.0	59.6	2496.7	8.1	7.0	.0
25	39.3	94.2	530.8	36.9	577.1	11.0	11.1	.0
26	72.2	172.9	173.2	61.5	219.4	65.1	64.9	.2
27	54.7	130.9	55.1	46.1	127.7	10.3	10.5	.1
TOTAL	2512.4	6640.3	12899.6	2274.6	16856.4	389.9	382.8	2.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1989
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3673.7	.0	942.5	2735.0	.0	.0	.0
2	5.2	13.5	.0	3.5	10.0	.0	.0	.0
3	160.4	457.1	.0	109.4	347.5	.3	.0	.0
4	66.5	189.6	.0	45.4	144.2	.1	.0	.0
5	59.0	152.8	347.5	47.9	438.3	14.2	15.2	.0
6	20.1	52.2	.0	14.8	25.7	11.7	11.7	.0
7	111.1	287.9	144.2	85.1	304.7	42.3	42.5	.0
8	48.4	125.3	2735.0	54.6	2793.7	12.1	12.1	.0
9	56.5	146.4	448.3	44.2	538.4	12.1	12.3	.0
10	41.3	107.1	.0	30.0	66.9	10.2	10.2	.0
11	28.8	74.5	25.7	21.1	73.2	6.0	6.0	.0
12	48.8	126.5	304.7	38.9	390.3	2.0	1.9	.1
13	41.3	107.0	2793.7	46.6	2846.0	8.1	8.1	.0
14	37.8	97.9	538.4	30.3	595.2	10.8	10.9	.0
15	37.4	96.9	66.9	27.4	130.6	5.8	5.7	.1
16	66.7	172.9	73.2	53.4	183.8	9.2	8.9	.5
17	51.8	134.1	390.3	38.8	446.3	39.4	39.4	.0
18	44.6	115.7	2846.0	50.3	2898.8	12.6	12.6	.0
19	28.0	72.6	595.2	22.7	640.4	4.7	2.1	.1
20	38.8	100.4	130.6	29.1	187.2	14.7	14.4	.3
21	59.6	154.5	183.8	49.4	231.7	57.6	56.9	.8
22	16.9	43.9	.0	11.5	29.2	3.1	2.8	.0
23	40.3	104.4	.0	27.1	64.8	12.6	12.6	.1
24	55.3	143.3	2898.8	59.7	2973.8	8.6	8.2	.0
25	39.3	101.8	640.5	31.1	701.6	9.6	9.6	.0
26	72.2	186.9	216.5	53.4	281.7	68.3	68.2	.2
27	54.7	141.6	64.8	41.3	156.3	8.8	8.7	.1
TOTAL	2512.4	7180.7	15444.2	2009.4	20235.5	384.8	381.1	2.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1990
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	6181.8	.0	1147.2	4963.0	.0	.0	.0
2	5.2	22.8	.0	4.5	18.3	.0	.0	.0
3	160.4	769.2	.0	138.1	630.6	.3	.0	.0
4	66.5	319.1	.0	57.3	261.7	.1	.0	.0
5	59.0	257.2	630.6	58.3	809.7	19.7	17.0	.0
6	20.1	87.8	.0	18.5	53.1	16.2	16.0	.0
7	111.1	484.4	261.7	105.4	585.8	54.9	53.1	.0
8	48.4	210.9	4963.0	55.9	5098.9	18.3	17.1	.0
9	56.5	246.4	828.1	54.2	1003.9	16.5	16.0	.0
10	41.3	180.2	.0	37.4	127.3	15.5	14.7	.0
11	28.8	125.4	53.1	26.3	144.1	8.1	7.9	.0
12	48.8	212.8	585.8	47.3	748.7	2.6	2.2	.1
13	41.3	180.1	5098.9	47.7	5219.0	11.7	10.7	.0
14	37.8	164.8	1003.9	36.1	1117.5	15.0	13.8	.0
15	37.4	163.1	127.3	34.1	248.6	7.6	5.1	.1
16	66.7	291.0	144.1	64.0	357.8	11.6	9.4	.5
17	51.8	225.7	748.7	48.2	869.4	56.8	55.3	.0
18	44.6	194.7	5219.0	51.6	5343.4	18.0	17.5	.0
19	28.0	122.2	1117.5	27.0	1205.9	6.8	-3.8	.1
20	38.8	168.9	248.7	36.1	362.2	19.3	18.6	.3
21	59.6	260.1	357.8	58.8	474.5	81.8	80.3	.8
22	16.9	73.8	.0	14.6	54.3	4.9	3.4	.0
23	40.3	175.8	.0	34.4	121.3	20.1	18.7	.1
24	55.3	241.1	5343.4	63.9	5506.1	13.9	3.1	.0
25	39.3	171.3	1206.1	38.0	1325.6	13.8	13.5	.0
26	72.2	314.6	416.5	67.0	571.7	92.4	91.6	.2
27	54.7	238.3	121.3	51.2	296.9	11.5	11.0	.1
TOTAL	2512.4	12083.4	28475.5	2423.2	37519.2	537.5	492.3	2.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1991
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	4138.7	.0	914.9	3268.9	.0	.0	.0
2	5.2	15.3	.0	3.4	11.8	.0	.0	.0
3	160.4	515.0	.0	107.4	407.4	.3	.0	.0
4	66.5	213.6	.0	44.5	169.0	.1	.0	.0
5	59.0	172.2	407.4	45.5	519.6	14.5	15.2	.0
6	20.1	58.8	.0	14.4	32.4	11.9	12.0	.0
7	111.1	324.3	169.0	81.7	368.7	43.0	44.1	.0
8	48.4	141.2	3268.9	54.2	3342.7	13.6	13.7	.0
9	56.5	165.0	531.4	41.5	642.6	12.3	12.5	.0
10	41.3	120.6	.0	29.0	80.6	11.0	11.5	.0
11	28.8	83.9	32.4	20.5	89.7	6.2	6.3	.0
12	48.8	142.5	368.7	36.9	472.2	2.0	2.1	.1
13	41.3	120.5	3342.7	46.3	3408.3	9.0	9.2	.0
14	37.8	110.3	642.6	28.2	713.6	11.2	11.4	.0
15	37.4	109.2	80.6	26.4	157.5	5.9	6.1	.1
16	66.7	194.8	89.7	52.1	223.4	10.0	10.1	.5
17	51.8	151.1	472.2	37.7	543.7	42.0	42.2	.0
18	44.6	130.3	3408.3	50.1	3474.7	14.2	14.3	.0
19	28.0	81.8	713.6	21.3	769.1	5.0	.9	.1
20	38.8	113.1	157.5	28.3	227.3	15.0	14.9	.3
21	59.6	174.1	223.4	48.3	288.0	62.7	62.2	.8
22	16.9	49.4	.0	11.4	34.8	3.3	3.7	.0
23	40.3	117.7	.0	26.7	77.4	13.6	14.2	.1
24	55.3	161.4	3474.7	60.8	3565.8	9.9	8.2	.0
25	39.3	114.7	769.2	30.0	843.6	10.3	10.5	.0
26	72.2	210.6	262.1	52.4	350.8	69.5	69.6	.2
27	54.7	159.5	77.4	39.5	188.5	8.9	9.1	.1
TOTAL	2512.4	8089.8	18491.8	1953.5	24272.1	405.2	404.0	2.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1992
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	2380.6	.0	791.8	1631.2	.0	.0	.0
2	5.2	8.8	.0	2.8	5.9	.0	.0	.0
3	160.4	296.2	.0	89.9	206.1	.3	.0	.0
4	66.5	122.9	.0	37.3	85.6	.1	.0	.0
5	59.0	99.0	206.1	40.0	253.6	11.6	12.4	.0
6	20.1	33.8	.0	12.4	13.0	8.4	8.5	.0
7	111.1	186.5	85.6	71.1	166.2	34.9	35.8	.0
8	48.4	81.2	1631.2	51.6	1652.2	9.1	9.3	.0
9	56.5	94.9	259.5	36.7	307.8	10.0	10.2	.0
10	41.3	69.4	.0	25.4	36.8	7.2	7.8	.0
11	28.8	48.3	13.0	17.7	38.8	4.8	4.9	.0
12	48.8	82.0	166.2	32.3	214.3	1.6	1.8	.1
13	41.3	69.3	1652.2	44.1	1671.4	6.4	6.7	.0
14	37.8	63.5	307.8	25.0	337.9	8.3	8.5	.0
15	37.4	62.8	36.8	23.1	71.8	4.7	5.0	.1
16	66.7	112.1	38.8	44.7	99.1	7.7	8.0	.5
17	51.8	86.9	214.3	33.0	241.5	26.7	26.9	.0
18	44.6	75.0	1671.4	47.6	1688.7	10.4	10.6	.0
19	28.0	47.0	337.9	18.8	362.6	3.6	3.5	.1
20	38.8	65.1	71.8	24.3	100.8	11.7	11.8	.3
21	59.6	100.1	99.1	41.7	116.5	42.3	41.9	.8
22	16.9	28.4	.0	9.4	17.1	1.9	3.1	.0
23	40.3	67.7	.0	22.0	37.1	8.6	9.5	.1
24	55.3	92.9	1688.7	57.2	1718.8	6.0	6.4	.0
25	39.3	66.0	362.6	26.4	394.6	7.6	7.8	.0
26	72.2	121.1	117.9	44.9	142.9	51.2	51.4	.2
27	54.7	91.8	37.1	34.7	86.7	7.5	7.6	.1
TOTAL	2512.4	4653.2	8997.8	1705.9	11698.7	292.5	299.1	2.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1993
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3408.5	.0	985.3	2379.0	.0	.0	.0
2	5.2	12.6	.0	3.8	8.8	.0	.0	.0
3	160.4	424.1	.0	117.9	305.8	.3	.0	.0
4	66.5	175.9	.0	48.9	127.0	.1	.0	.0
5	59.0	141.8	305.8	49.3	384.1	14.2	13.9	.0
6	20.1	48.4	.0	15.6	21.5	11.3	11.1	.0
7	111.1	267.1	127.0	88.6	262.7	42.7	41.3	.0
8	48.4	116.3	2379.0	52.7	2430.9	11.2	11.0	.0
9	56.5	135.9	392.9	45.0	472.4	11.4	11.0	.0
10	41.3	99.3	.0	31.5	57.8	10.0	9.5	.0
11	28.8	69.1	21.5	22.1	62.6	5.9	5.8	.0
12	48.8	117.3	262.7	39.9	338.2	1.9	1.6	.1
13	41.3	99.3	2430.9	45.0	2477.2	7.6	7.4	.0
14	37.8	90.9	472.4	30.3	522.9	10.0	9.7	.0
15	37.4	89.9	57.8	28.7	113.2	5.8	5.2	.1
16	66.7	160.4	62.6	54.2	158.6	9.0	7.4	.5
17	51.8	124.4	338.2	40.8	385.7	36.1	35.8	.0
18	44.6	107.3	2477.2	48.7	2523.3	12.2	12.2	.0
19	28.0	67.4	522.9	22.9	563.0	4.4	2.4	.1
20	38.8	93.2	113.2	30.5	160.9	14.9	14.3	.3
21	59.6	143.4	158.6	49.7	196.2	54.1	52.8	.8
22	16.9	40.7	.0	12.4	25.3	3.0	2.7	.0
23	40.3	96.9	.0	29.0	55.8	12.1	11.3	.1
24	55.3	132.9	2523.3	59.3	2588.8	7.8	7.2	.0
25	39.3	94.5	563.0	32.3	615.7	9.5	9.3	.0
26	72.2	173.5	186.2	56.4	236.5	66.7	66.1	.2
27	54.7	131.4	55.8	42.9	135.5	8.8	8.4	.1
TOTAL	2512.4	6662.5	13451.2	2084.0	17609.6	371.0	357.4	2.2

(2) Under Draft with Irrigation Water Demand

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1980
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3689.2	.0	1025.4	2691.3	.0	.0	.0
2	5.2	13.6	.0	3.7	9.9	.0	.0	.0
3	160.4	459.1	.0	116.7	342.6	.3	.0	.0
4	66.5	190.4	.0	48.4	141.9	.1	.0	.0
5	59.0	153.5	342.6	50.7	431.4	15.2	12.3	.0
6	20.1	52.4	.0	15.8	26.2	10.7	11.2	.0
7	111.1	289.1	141.9	91.7	297.8	44.9	40.5	.0
8	48.4	125.8	2691.3	53.9	2744.1	11.7	11.6	.0
9	56.5	147.0	441.2	46.5	529.2	12.6	12.0	.0
10	41.3	107.5	.0	32.1	65.3	10.1	9.1	.0
11	28.8	74.8	26.2	22.3	72.7	6.0	6.5	.0
12	48.8	127.0	297.8	40.9	381.9	2.1	1.8	.1
13	41.3	107.5	2744.1	46.0	2797.7	7.6	7.4	.0
14	37.8	98.4	529.2	31.6	585.3	11.1	10.3	.0
15	37.4	97.3	65.3	29.3	127.4	5.9	.3	6.0
16	66.7	173.7	72.7	54.5	182.0	8.4	2.2	8.8
17	51.8	134.7	381.9	41.1	439.4	36.2	35.7	.0
18	44.6	116.2	2797.7	49.7	2850.8	11.4	11.3	.0
19	28.0	72.9	585.3	23.6	629.8	4.8	1.1	.1
20	38.8	100.8	127.4	30.7	183.1	14.4	2.3	13.7
21	59.6	155.2	182.0	50.5	237.3	62.4	53.0	28.4
22	16.9	44.1	.0	12.2	28.8	3.0	3.2	.0
23	40.3	104.9	.0	28.8	63.5	12.6	9.7	6.5
24	55.3	143.9	2850.8	60.6	2917.1	7.5	4.7	.0
25	39.3	102.3	629.9	33.5	689.5	10.3	10.2	.0
26	72.2	187.7	211.9	56.9	280.6	63.6	43.8	25.1
27	54.7	142.2	63.5	43.7	152.9	9.4	-18.1	32.3
TOTAL	2512.4	7211.2	15182.7	2140.5	19899.5	382.3	282.3	120.9

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1981
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3615.5	.0	931.8	2743.4	.0	.0	.0
2	5.2	13.3	.0	3.0	10.3	.0	.0	.0
3	160.4	449.9	.0	97.3	352.6	.3	.0	.0
4	66.5	186.6	.0	40.3	146.2	.1	.0	.0
5	59.0	150.4	352.6	47.0	443.7	12.3	14.1	.0
6	20.1	51.4	.0	14.0	29.5	7.9	8.2	.0
7	111.1	283.3	146.2	82.4	314.5	32.6	35.8	.0
8	48.4	123.3	2743.4	52.8	2802.5	12.2	12.1	.0
9	56.5	144.1	454.0	41.4	546.8	9.9	10.7	.0
10	41.3	105.4	.0	27.6	69.9	7.9	8.7	.0
11	28.8	73.3	29.5	19.5	78.6	4.7	4.9	.0
12	48.8	124.5	314.5	37.7	399.6	1.7	2.2	.1
13	41.3	105.3	2802.5	45.1	2855.0	8.2	8.4	.0
14	37.8	96.4	546.8	28.6	605.4	9.3	10.0	.0
15	37.4	95.4	69.9	25.4	135.5	4.4	-1.7	9.0
16	66.7	170.2	78.6	52.4	189.5	7.8	.6	12.9
17	51.8	132.0	399.6	36.6	466.0	29.1	29.7	.0
18	44.6	113.9	2855.0	48.8	2907.5	13.1	13.1	.0
19	28.0	71.4	605.4	21.7	650.9	4.2	.3	.1
20	38.8	98.8	135.5	28.0	194.9	11.4	-1.7	20.1
21	59.6	152.1	189.5	49.7	250.1	43.7	4.7	41.6
22	16.9	43.2	.0	10.2	30.6	2.4	3.3	.0
23	40.3	102.8	.0	23.7	67.8	11.3	9.3	9.7
24	55.3	141.0	2907.5	60.4	2979.7	9.0	4.3	.0
25	39.3	100.2	651.0	30.5	712.1	8.6	9.8	.0
26	72.2	184.0	225.5	50.8	310.5	48.2	22.6	37.0
27	54.7	139.4	67.8	39.1	161.3	6.8	-32.3	47.1
TOTAL	2512.4	7067.1	15574.9	1945.9	20454.5	306.7	177.1	177.5

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1982
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	4057.9	.0	883.5	3152.8	.0	.0	.0
2	5.2	15.0	.0	2.9	12.0	.0	.0	.0
3	160.4	504.9	.0	92.8	411.6	.3	.0	.0
4	66.5	209.5	.0	38.5	170.9	.1	.0	.0
5	59.0	168.8	411.6	44.2	523.2	13.1	12.8	.0
6	20.1	57.6	.0	13.4	35.5	8.8	8.7	.0
7	111.1	318.0	170.9	77.6	376.7	34.7	33.8	.0
8	48.4	138.4	3152.8	52.0	3225.7	13.3	12.3	.0
9	56.5	161.7	535.2	39.8	646.3	10.8	10.5	.0
10	41.3	118.3	.0	26.1	83.9	8.3	8.4	.0
11	28.8	82.3	35.5	18.9	93.8	5.0	5.0	.0
12	48.8	139.7	376.7	35.8	478.7	1.9	1.7	.1
13	41.3	118.2	3225.7	44.4	3290.6	8.8	8.3	.0
14	37.8	108.2	646.3	27.1	717.1	10.2	10.1	.0
15	37.4	107.1	83.9	24.0	162.5	4.4	-4.2	9.8
16	66.7	191.0	93.8	48.7	227.4	8.7	-5.6	14.1
17	51.8	148.2	478.7	35.7	557.3	33.8	33.6	.0
18	44.6	127.8	3290.6	48.0	3356.3	13.9	13.5	.0
19	28.0	80.2	717.1	20.6	772.0	4.8	1.5	.1
20	38.8	110.9	162.5	26.8	234.2	12.5	-5.0	21.9
21	59.6	170.7	227.4	45.1	297.2	55.1	9.8	45.1
22	16.9	48.5	.0	9.8	36.2	2.5	3.7	.0
23	40.3	115.4	.0	22.2	80.9	12.3	6.6	10.6
24	55.3	158.3	3356.3	58.3	3446.7	9.4	4.3	.0
25	39.3	112.5	772.1	29.0	845.6	9.9	9.4	.0
26	72.2	206.5	270.4	49.4	371.8	55.7	11.6	40.4
27	54.7	156.4	80.9	36.9	193.3	7.0	-44.9	51.2
TOTAL	2512.4	7931.8	18088.3	1851.4	23800.1	345.0	146.0	193.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1983
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3551.7	.0	937.3	2593.1	.0	.0	.0
2	5.2	13.1	.0	3.4	9.6	.0	.0	.0
3	160.4	441.9	.0	106.3	334.2	.3	.0	.0
4	66.5	183.3	.0	44.1	138.7	.1	.0	.0
5	59.0	147.8	334.2	46.2	422.2	13.1	13.3	.0
6	20.1	50.5	.0	14.7	24.6	11.0	11.0	.0
7	111.1	278.3	138.7	83.3	291.6	41.5	41.1	.0
8	48.4	121.2	2593.1	53.2	2649.0	11.7	11.7	.0
9	56.5	141.6	431.9	42.6	519.4	11.2	11.1	.0
10	41.3	103.5	.0	29.2	64.6	9.5	9.1	.0
11	28.8	72.0	24.6	20.6	70.0	5.7	5.6	.0
12	48.8	122.3	291.6	37.8	374.0	1.8	1.7	.1
13	41.3	103.4	2649.0	45.5	2698.9	7.9	7.8	.0
14	37.8	94.7	519.4	29.0	574.9	10.0	9.9	.0
15	37.4	93.7	64.6	26.8	125.9	5.4	-4.6	8.4
16	66.7	167.2	70.0	53.0	174.7	9.2	-4.3	12.1
17	51.8	129.7	374.0	38.7	427.0	37.7	37.6	.0
18	44.6	111.8	2698.9	49.2	2748.7	12.6	12.6	.0
19	28.0	70.2	574.9	21.8	618.7	4.4	2.9	.1
20	38.8	97.1	125.9	29.0	179.3	14.5	-5.9	18.6
21	59.6	149.4	174.7	49.2	216.9	57.4	18.9	38.4
22	16.9	42.4	.0	11.3	28.3	2.8	3.3	.0
23	40.3	101.0	.0	26.0	62.8	12.1	4.4	9.0
24	55.3	138.5	2748.7	59.7	2818.7	8.4	8.0	.0
25	39.3	98.4	618.7	30.7	676.9	9.4	9.3	.0
26	72.2	180.7	207.5	53.7	268.2	66.1	30.9	34.3
27	54.7	136.9	62.8	39.8	151.2	8.4	-37.3	43.5
TOTAL	2512.4	6942.4	14703.3	1982.1	19262.2	372.2	198.1	164.3

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1984
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	5070.2	.0	981.6	4074.8	.0	.0	.0
2	5.2	18.7	.0	3.6	15.1	.0	.0	.0
3	160.4	630.9	.0	113.6	517.9	.3	.0	.0
4	66.5	261.7	.0	47.1	215.0	.1	.0	.0
5	59.0	210.9	517.9	49.9	662.6	16.7	15.1	.0
6	20.1	72.0	.0	15.4	45.0	11.8	11.7	.0
7	111.1	397.3	215.0	88.2	479.7	45.0	44.3	.0
8	48.4	173.0	4074.8	53.2	4178.6	15.8	13.6	.0
9	56.5	202.1	677.8	44.9	821.6	13.7	13.4	.0
10	41.3	147.8	.0	31.3	105.5	11.2	10.8	.0
11	28.8	102.8	45.0	21.9	119.3	6.7	6.7	.0
12	48.8	174.6	479.7	39.8	612.5	2.2	2.0	.1
13	41.3	147.7	4178.6	45.4	4270.5	10.3	9.0	.0
14	37.8	135.2	821.6	30.2	914.2	12.5	10.6	.0
15	37.4	133.8	105.5	28.6	204.6	6.2	-3.1	7.7
16	66.7	238.7	119.3	54.9	293.1	9.8	-2.7	11.0
17	51.8	185.1	612.5	40.4	714.5	43.0	40.2	.0
18	44.6	159.7	4270.5	49.1	4365.1	15.9	14.4	.0
19	28.0	100.2	914.3	22.8	986.1	5.7	.6	.1
20	38.8	138.6	204.6	30.0	298.1	15.4	-7.6	17.6
21	59.6	213.3	293.1	50.8	388.4	66.8	29.5	36.9
22	16.9	60.6	.0	11.9	45.5	3.2	2.9	.0
23	40.3	144.2	.0	27.6	100.9	15.8	4.2	8.3
24	55.3	197.8	4365.2	59.6	4491.8	11.6	5.9	.0
25	39.3	140.5	986.2	32.0	1083.7	11.3	10.8	.0
26	72.2	258.0	343.6	55.1	476.8	70.0	35.6	32.5
27	54.7	195.4	100.9	42.5	244.7	9.4	-34.0	42.0
TOTAL	2512.4	9910.6	23326.2	2071.4	30725.8	430.5	234.1	156.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1985
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	4151.5	.0	1009.0	3069.8	.0	.0	.0
2	5.2	15.3	.0	3.9	11.3	.0	.0	.0
3	160.4	516.6	.0	121.6	391.4	.3	.0	.0
4	66.5	214.3	.0	50.4	162.5	.1	.0	.0
5	59.0	172.7	391.4	51.6	493.3	15.9	15.6	.0
6	20.1	59.0	.0	16.3	29.7	12.5	12.3	.0
7	111.1	325.3	162.5	92.2	344.4	47.6	46.2	.0
8	48.4	141.6	3069.8	53.8	3143.9	13.1	12.9	.0
9	56.5	165.5	504.7	47.2	608.2	13.1	12.7	.0
10	41.3	121.0	.0	32.8	76.0	11.1	10.8	.0
11	28.8	84.2	29.7	23.2	83.3	6.7	6.6	.0
12	48.8	142.9	344.4	41.8	442.0	2.2	1.9	.1
13	41.3	120.9	3143.9	45.9	3209.7	8.7	8.6	.0
14	37.8	110.7	608.2	31.7	674.5	11.6	11.2	.0
15	37.4	109.5	76.0	30.0	148.0	6.5	-.9	6.2
16	66.7	195.4	83.3	56.3	209.0	9.9	-1.1	8.9
17	51.8	151.6	442.0	42.6	508.2	41.4	40.8	.0
18	44.6	130.7	3209.7	49.7	3276.2	13.8	13.7	.0
19	28.0	82.0	674.5	23.8	726.8	5.2	.9	.1
20	38.8	113.5	148.0	31.8	212.3	16.4	-2.9	14.9
21	59.6	174.6	209.0	52.0	265.4	62.8	30.0	31.7
22	16.9	49.6	.0	12.7	33.4	3.2	2.5	.0
23	40.3	118.0	.0	29.9	73.4	14.0	4.6	6.7
24	55.3	161.9	3276.2	60.8	3366.9	9.5	6.9	.0
25	39.3	115.1	726.9	33.4	796.4	10.9	10.4	.0
26	72.2	211.3	245.6	58.8	320.2	75.9	43.3	27.4
27	54.7	160.0	73.4	44.7	177.4	9.7	-30.0	36.8
TOTAL	2512.4	8114.7	17419.3	2148.0	22853.7	422.0	256.8	132.8

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1986
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	2485.5	.0	909.3	1681.4	.0	.0	.0
2	5.2	9.2	.0	3.2	6.0	.0	.0	.0
3	160.4	309.3	.0	101.6	210.8	.3	.0	.0
4	66.5	128.3	.0	42.1	87.5	.1	.0	.0
5	59.0	103.4	210.8	45.7	258.3	13.4	14.8	.0
6	20.1	35.3	.0	14.1	13.4	8.4	8.6	.0
7	111.1	194.8	87.5	80.9	165.6	39.3	41.4	.0
8	48.4	84.8	1681.4	52.2	1705.9	9.2	9.4	.0
9	56.5	99.1	264.4	41.4	312.8	10.9	11.4	.0
10	41.3	72.4	.0	28.7	37.2	7.5	8.2	.0
11	28.8	50.4	13.4	20.0	39.3	5.3	5.5	.0
12	48.8	85.6	165.6	36.9	213.9	1.8	2.1	.1
13	41.3	72.4	1705.9	44.5	1728.1	6.5	6.7	.0
14	37.8	66.3	312.8	28.0	343.1	9.0	9.5	.0
15	37.4	65.6	37.2	26.4	72.2	5.3	-1.1	7.7
16	66.7	117.0	39.3	51.4	99.4	9.4	.6	11.0
17	51.8	90.7	213.9	37.4	241.0	27.6	28.1	.0
18	44.6	78.3	1728.1	48.1	1748.5	10.7	10.9	.0
19	28.0	49.1	343.1	21.1	368.0	3.9	2.9	.1
20	38.8	67.9	72.2	27.6	100.4	13.1	-1.8	17.9
21	59.6	104.6	99.4	47.3	117.6	43.7	7.2	37.6
22	16.9	29.7	.0	10.6	17.5	2.0	2.4	.0
23	40.3	70.7	.0	24.9	37.8	8.7	5.2	8.3
24	55.3	96.9	1748.5	59.3	1780.9	6.5	6.9	.0
25	39.3	68.9	368.1	29.7	400.0	8.6	9.2	.0
26	72.2	126.5	117.8	50.7	144.2	51.4	23.5	33.0
27	54.7	95.8	37.8	39.0	87.9	8.3	-31.6	43.1
TOTAL	2512.4	4858.3	9247.1	1921.9	12018.6	310.9	179.8	158.8

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1987
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	2736.5	.0	933.4	1805.0	.0	.0	.0
2	5.2	10.1	.0	3.5	6.6	.0	.0	.0
3	160.4	340.5	.0	111.3	228.9	.3	.0	.0
4	66.5	141.3	.0	46.1	95.1	.1	.0	.0
5	59.0	113.8	228.9	46.7	284.0	12.0	12.0	.0
6	20.1	38.9	.0	14.5	15.9	8.5	8.4	.0
7	111.1	214.4	95.1	82.8	189.9	36.8	36.3	.0
8	48.4	93.3	1805.0	52.3	1836.5	9.6	9.6	.0
9	56.5	109.1	290.5	42.5	347.0	10.1	9.9	.0
10	41.3	79.7	.0	29.8	41.9	8.0	8.0	.0
11	28.8	55.5	15.9	20.7	45.7	5.1	5.1	.0
12	48.8	94.2	189.9	37.4	245.1	1.7	1.5	.1
13	41.3	79.7	1836.5	44.7	1865.0	6.6	6.6	.0
14	37.8	73.0	347.0	28.8	382.6	8.6	8.5	.0
15	37.4	72.2	41.9	27.2	81.8	5.1	-1.7	6.7
16	66.7	128.8	45.7	50.8	116.1	7.6	-2.0	9.6
17	51.8	99.9	245.1	38.3	279.0	27.7	27.6	.0
18	44.6	86.2	1865.0	48.3	1892.1	10.8	10.8	.0
19	28.0	54.1	382.6	21.7	411.3	3.8	2.9	.1
20	38.8	74.8	81.8	28.2	116.3	12.1	-3.6	15.5
21	59.6	115.1	116.1	46.7	141.7	42.6	9.6	32.8
22	16.9	32.7	.0	11.5	18.9	2.3	2.5	.0
23	40.3	77.8	.0	27.1	41.1	9.7	3.9	7.2
24	55.3	106.7	1892.1	58.3	1934.1	6.5	6.1	.0
25	39.3	75.8	411.3	30.5	448.4	8.2	8.0	.0
26	72.2	139.3	135.1	51.8	172.9	49.6	20.1	28.6
27	54.7	105.5	41.1	40.5	98.1	7.9	-30.8	37.5
TOTAL	2512.4	5348.8	10066.6	1975.2	13140.8	301.2	159.5	137.9

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1988
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3397.2	.0	1092.8	2286.4	.0	.0	.0
2	5.2	12.5	.0	3.8	8.7	.0	.0	.0
3	160.4	422.7	.0	118.5	303.9	.3	.0	.0
4	66.5	175.4	.0	49.1	126.2	.1	.0	.0
5	59.0	141.3	303.9	56.5	372.0	16.8	16.6	.0
6	20.1	48.3	.0	17.1	20.2	11.0	11.0	.0
7	111.1	266.2	126.2	99.5	244.0	48.8	49.6	.0
8	48.4	115.9	2286.4	52.3	2338.9	10.9	10.9	.0
9	56.5	135.4	380.7	51.6	451.0	13.5	13.5	.0
10	41.3	99.0	.0	34.6	54.2	10.2	10.1	.0
11	28.8	68.9	20.2	24.3	57.9	6.9	6.9	.0
12	48.8	117.0	244.0	45.2	313.5	2.3	2.3	.1
13	41.3	98.9	2338.9	44.6	2385.6	7.5	7.4	.0
14	37.8	90.6	451.0	35.1	495.0	11.5	11.4	.0
15	37.4	89.6	54.2	31.9	105.1	6.7	.3	6.3
16	66.7	159.9	57.9	60.9	146.0	10.7	1.1	9.1
17	51.8	124.0	313.5	45.0	356.7	35.8	35.9	.0
18	44.6	107.0	2385.6	48.2	2432.0	12.2	12.1	.0
19	28.0	67.1	495.0	26.4	530.7	5.0	1.8	.1
20	38.8	92.8	105.1	33.5	147.8	16.6	2.4	14.3
21	59.6	142.9	146.0	55.9	179.3	53.6	23.7	30.1
22	16.9	40.6	.0	12.6	25.3	2.7	2.2	.0
23	40.3	96.6	.0	29.1	55.1	12.4	3.7	6.8
24	55.3	132.5	2432.0	59.6	2498.7	8.1	7.0	.0
25	39.3	94.2	530.8	36.9	577.1	11.0	11.1	.0
26	72.2	172.9	173.2	61.5	219.4	65.1	39.4	26.4
27	54.7	130.9	55.1	48.1	127.7	10.3	-23.4	34.3
TOTAL	2512.4	6640.3	12699.6	2274.6	16856.4	389.9	257.2	127.5

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1989
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3673.7	.0	942.5	2735.0	.0	.0	.0
2	5.2	13.5	.0	3.5	10.0	.0	.0	.0
3	160.4	457.1	.0	109.4	347.5	.3	.0	.0
4	66.5	189.6	.0	45.4	144.2	.1	.0	.0
5	59.0	152.8	347.5	47.9	438.3	14.2	15.2	.0
6	20.1	52.2	.0	14.8	25.7	11.7	11.7	.0
7	111.1	287.9	144.2	85.1	304.7	42.3	42.5	.0
8	48.4	125.3	2735.0	54.6	2793.7	12.1	12.1	.0
9	56.5	146.4	448.3	44.2	538.4	12.1	12.3	.0
10	41.3	107.1	.0	30.0	66.9	10.2	10.3	.0
11	28.8	74.5	25.7	21.1	73.2	6.0	6.0	.0
12	48.8	126.5	304.7	36.9	390.3	2.0	1.9	.1
13	41.3	107.0	2793.7	46.6	2846.0	8.1	8.1	.0
14	37.8	97.9	538.4	30.3	595.2	10.8	10.9	.0
15	37.4	96.9	66.9	27.4	130.6	5.8	-1.6	7.6
16	66.7	172.9	73.2	53.4	183.8	9.2	-1.2	11.0
17	51.8	134.1	390.3	38.8	446.3	39.4	39.4	.0
18	44.6	115.7	2846.0	50.3	2898.8	12.6	12.6	.0
19	28.0	72.6	595.2	22.7	640.4	4.7	2.3	.1
20	38.8	100.4	130.6	29.1	187.2	14.7	-1.8	16.5
21	59.6	154.5	183.8	49.4	231.7	57.6	23.6	34.1
22	16.9	43.9	.0	11.5	29.2	3.1	2.8	.0
23	40.3	104.4	.0	27.1	64.8	12.6	4.3	8.2
24	55.3	143.3	2898.8	59.7	2973.8	8.6	8.3	.0
25	39.3	101.8	640.5	31.1	701.6	9.6	9.6	.0
26	72.2	186.9	216.5	53.4	281.7	68.3	38.1	30.4
27	54.7	141.6	64.8	41.3	156.3	8.8	-29.7	38.5
TOTAL	2512.4	7180.7	15444.2	2009.4	20235.5	384.8	237.9	146.3

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1990
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	6181.8	.0	1147.2	4963.0	.0	.0	.0
2	5.2	22.8	.0	4.5	18.3	.0	.0	.0
3	160.4	769.2	.0	138.1	630.6	.3	.0	.0
4	66.5	319.1	.0	57.3	261.7	.1	.0	.0
5	59.0	257.2	630.6	58.3	809.7	19.7	17.0	.0
6	20.1	87.8	.0	18.5	53.1	16.2	16.0	.0
7	111.1	484.4	261.7	105.4	585.8	54.9	53.1	.0
8	48.4	210.9	4963.0	55.9	5098.9	18.3	17.1	.0
9	56.5	246.4	828.1	54.2	1003.9	16.5	16.0	.0
10	41.3	180.2	.0	37.4	127.3	15.5	14.7	.0
11	28.8	125.4	53.1	26.3	144.1	8.1	7.9	.0
12	48.8	212.8	585.8	47.3	748.7	2.6	2.2	.1
13	41.3	180.1	5098.9	47.7	5219.0	11.7	10.7	.0
14	37.8	164.8	1003.9	36.1	1117.5	15.0	13.8	.0
15	37.4	163.1	127.3	34.1	248.6	7.6	.4	5.0
16	66.7	291.0	144.1	64.0	357.8	11.6	1.4	7.3
17	51.8	225.7	748.7	48.2	869.4	56.8	55.3	.0
18	44.6	194.7	5219.0	51.6	5343.4	18.0	17.5	.0
19	28.0	122.2	1117.5	27.0	1205.9	6.8	-3.6	.1
20	38.8	168.9	248.6	36.1	362.1	19.3	4.6	11.6
21	59.6	260.1	357.8	58.8	474.5	81.8	55.8	24.6
22	16.9	73.8	.0	14.6	54.3	4.9	3.1	.0
23	40.3	175.8	.0	34.4	121.3	20.1	5.2	5.4
24	55.3	241.1	5343.4	63.9	5506.1	13.9	3.2	.0
25	39.3	171.3	1206.1	38.0	1325.6	13.8	13.2	.0
26	72.2	314.6	416.5	67.0	571.7	92.4	65.4	21.3
27	54.7	238.3	121.3	51.2	296.9	11.5	-20.1	28.0
TOTAL	2512.4	12083.4	28475.3	2423.2	37519.0	537.5	370.0	103.3

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1991
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	4138.7	.0	914.9	3268.9	.0	.0	.0
2	5.2	15.3	.0	3.4	11.8	.0	.0	.0
3	160.4	515.0	.0	107.4	407.4	.3	.0	.0
4	66.5	213.6	.0	44.5	169.0	.1	.0	.0
5	59.0	172.2	407.4	45.5	519.6	14.5	15.2	.0
6	20.1	58.8	.0	14.4	32.4	11.9	12.0	.0
7	111.1	324.3	169.0	81.7	368.7	43.0	44.1	.0
8	48.4	141.2	3268.9	54.2	3342.7	13.6	13.7	.0
9	56.5	165.0	531.4	41.5	642.6	12.3	12.5	.0
10	41.3	120.6	.0	29.0	80.6	11.0	11.5	.0
11	28.8	83.9	32.4	20.5	89.7	6.2	6.3	.0
12	48.8	142.5	368.7	36.9	472.2	2.0	2.1	.1
13	41.3	120.5	3342.7	46.3	3408.3	9.0	9.2	.0
14	37.8	110.3	642.6	28.2	713.6	11.2	11.4	.0
15	37.4	109.2	80.6	26.4	157.5	5.9	-1.0	8.0
16	66.7	194.8	89.7	52.1	223.4	10.0	.5	11.6
17	51.8	151.1	472.2	37.7	543.7	42.0	42.2	.0
18	44.6	130.3	3408.3	50.1	3474.7	14.2	14.3	.0
19	28.0	81.8	713.6	21.3	769.1	5.0	1.2	.1
20	38.8	113.1	157.5	28.3	227.3	15.0	-.7	17.3
21	59.6	174.1	223.4	48.3	288.0	62.7	28.0	35.5
22	16.9	49.4	.0	11.4	34.8	3.3	3.6	.0
23	40.3	117.7	.0	26.7	77.4	13.6	7.3	8.6
24	55.3	161.4	3474.7	60.8	3565.8	9.9	8.3	.0
25	39.3	114.7	769.1	30.0	843.6	10.3	10.6	.0
26	72.2	210.6	262.1	52.4	350.8	69.5	40.9	31.8
27	54.7	159.5	77.4	39.5	188.5	8.9	-28.1	39.9
TOTAL	2512.4	8089.8	18491.8	1953.5	24272.0	405.2	265.2	152.8

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1992
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	2380.6	.0	791.8	1631.2	.0	.0	.0
2	5.2	8.8	.0	2.8	5.9	.0	.0	.0
3	160.4	296.2	.0	89.9	206.1	.3	.0	.0
4	66.5	122.9	.0	37.3	85.6	.1	.0	.0
5	59.0	99.0	206.1	40.0	253.6	11.6	12.4	.0
6	20.1	33.8	.0	12.4	13.0	8.4	8.5	.0
7	111.1	186.5	85.6	71.1	166.2	34.9	35.8	.0
8	48.4	81.2	1631.2	51.6	1652.2	9.1	9.3	.0
9	56.5	94.9	259.5	36.7	307.8	10.0	10.2	.0
10	41.3	69.4	.0	25.4	36.8	7.2	7.9	.0
11	28.8	48.3	13.0	17.7	38.8	4.8	4.9	.0
12	48.8	82.0	166.2	32.3	214.3	1.6	1.8	.1
13	41.3	69.3	1652.2	44.1	1671.4	6.4	6.7	.0
14	37.8	63.5	307.8	25.0	337.9	8.3	8.6	.0
15	37.4	62.8	36.8	23.1	71.8	4.7	-2.2	8.3
16	66.7	112.1	38.8	44.7	99.1	7.7	-2.4	11.9
17	51.8	86.9	214.3	33.0	241.5	26.7	26.9	.0
18	44.6	75.0	1671.4	47.6	1688.7	10.4	10.6	.0
19	28.0	47.0	337.9	18.8	362.6	3.6	3.6	.1
20	38.8	65.1	71.8	24.3	100.8	11.7	-3.7	18.7
21	59.6	100.1	99.1	41.7	116.5	42.3	4.1	38.9
22	16.9	28.4	.0	9.4	17.1	1.9	3.3	.0
23	40.3	67.7	.0	22.0	37.1	8.6	6.3	8.9
24	55.3	92.9	1688.7	57.2	1718.8	6.0	6.4	.0
25	39.3	66.0	362.6	26.4	394.6	7.6	7.9	.0
26	72.2	121.1	117.9	44.9	142.9	51.2	20.5	34.5
27	54.7	91.8	37.1	34.7	86.7	7.5	-34.6	44.4
TOTAL	2512.4	4653.2	8997.8	1705.9	11698.7	292.5	152.6	165.7

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1993
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3408.5	.0	985.3	2379.0	.0	.0	.0
2	5.2	12.6	.0	3.8	8.8	.0	.0	.0
3	160.4	424.1	.0	117.9	305.8	.3	.0	.0
4	66.5	175.9	.0	48.9	127.0	.1	.0	.0
5	59.0	141.8	305.8	49.3	384.1	14.2	13.9	.0
6	20.1	48.4	.0	15.6	21.5	11.3	11.1	.0
7	111.1	267.1	127.0	88.6	262.7	42.7	41.3	.0
8	48.4	116.3	2379.0	52.7	2430.9	11.2	11.0	.0
9	56.5	135.9	392.9	45.0	472.4	11.4	11.0	.0
10	41.3	99.3	.0	31.5	57.8	10.0	9.4	.0
11	28.8	69.1	21.5	22.1	62.6	5.9	5.8	.0
12	48.8	117.3	262.7	39.9	338.2	1.9	1.6	.1
13	41.3	99.3	2430.9	45.0	2477.2	7.6	7.4	.0
14	37.8	90.9	472.4	30.3	522.9	10.0	9.7	.0
15	37.4	89.9	57.8	28.7	113.2	5.8	-1.7	5.8
16	66.7	160.4	62.6	54.2	158.6	9.0	-2.2	8.4
17	51.8	124.4	338.2	40.8	385.7	36.1	35.8	.0
18	44.6	107.3	2477.2	48.7	2523.3	12.2	12.2	.0
19	28.0	67.4	522.9	22.9	563.0	4.4	2.7	.1
20	38.8	93.2	113.2	30.5	160.9	14.9	-2.5	13.5
21	59.6	143.4	158.6	49.7	196.2	54.1	24.4	28.6
22	16.9	40.7	.0	12.4	25.3	3.0	2.9	.0
23	40.3	96.9	.6	29.0	55.8	12.1	4.2	6.3
24	55.3	132.9	2523.3	59.3	2588.8	7.8	7.3	.0
25	39.3	94.5	563.0	32.3	615.7	9.5	9.1	.0
26	72.2	173.5	186.2	56.4	236.5	66.7	36.7	24.8
27	54.7	131.4	55.8	42.9	135.5	8.8	-28.1	32.8
TOTAL	2512.4	6662.5	13451.2	2084.0	17609.6	371.1	222.8	120.4

(3) Under Draft with Irrigation Water Demand <Water Demand x 1.25>

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1980
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3689.2	.0	1025.4	2691.3	.0	.0	.0
2	5.2	13.6	.0	3.7	9.9	.0	.0	.0
3	160.4	459.1	.0	116.7	342.6	.3	.0	.0
4	66.5	190.4	.0	48.4	141.9	.1	.0	.0
5	59.0	153.5	342.6	50.7	431.4	15.2	12.3	.0
6	20.1	52.4	.0	15.8	26.2	10.7	11.2	.0
7	111.1	289.1	141.9	91.7	297.8	44.9	40.5	.0
8	48.4	125.8	2691.3	53.9	2744.1	11.7	11.6	.0
9	56.5	147.0	441.2	46.5	529.2	12.6	12.0	.0
10	41.3	107.5	.0	32.1	65.3	10.1	9.1	.0
11	28.8	74.8	26.2	22.3	72.7	6.0	6.5	.0
12	48.8	127.0	297.8	40.9	381.9	2.1	1.8	.1
13	41.3	107.5	2744.1	46.0	2797.7	7.6	7.4	.0
14	37.8	98.4	529.2	31.6	585.3	11.1	10.3	.0
15	37.4	97.3	65.3	29.3	127.4	5.9	-.9	7.7
16	66.7	173.7	72.7	54.5	182.0	8.4	.9	11.1
17	51.8	134.7	381.9	41.1	439.4	36.2	35.7	.0
18	44.6	116.2	2797.7	49.7	2850.8	11.4	11.3	.0
19	28.0	72.9	585.3	23.6	629.8	4.8	1.2	.1
20	38.8	100.8	127.4	30.7	183.1	14.4	-.5	17.4
21	59.6	155.2	182.0	50.5	237.3	62.4	45.8	36.6
22	16.9	44.1	.0	12.2	28.8	3.0	3.3	.0
23	40.3	104.9	.0	28.8	63.5	12.6	9.6	8.3
24	55.3	143.9	2850.8	60.6	2917.1	7.5	4.7	.0
25	39.3	102.3	629.9	33.5	689.5	10.3	10.3	.0
26	72.2	187.7	211.9	56.9	280.6	63.6	38.9	32.2
27	54.7	142.2	63.5	43.7	152.9	9.4	-25.3	41.9
TOTAL	2512.4	7211.2	15182.7	2140.5	19899.5	382.3	258.0	155.3

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1981
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3615.5	.0	931.8	2743.4	.0	.0	.0
2	5.2	13.3	.0	3.0	10.3	.0	.0	.0
3	160.4	449.9	.0	97.3	352.6	.3	.0	.0
4	66.5	186.6	.0	40.3	146.2	.1	.0	.0
5	59.0	150.4	352.6	47.0	443.7	12.3	14.1	.0
6	20.1	51.4	.0	14.0	29.5	7.9	8.2	.0
7	111.1	283.3	146.2	82.4	314.5	32.6	35.8	.0
8	48.4	123.3	2743.4	52.8	2802.5	12.2	12.1	.0
9	56.5	144.1	454.0	41.4	546.8	9.9	10.7	.0
10	41.3	105.4	.0	27.6	69.9	7.9	8.7	.0
11	28.8	73.3	29.5	19.5	78.6	4.7	5.0	.0
12	48.8	124.5	314.5	37.7	399.6	1.7	2.2	.1
13	41.3	105.3	2802.5	45.1	2855.0	8.2	8.4	.0
14	37.8	96.4	546.8	28.6	605.4	9.3	10.0	.0
15	37.4	95.4	69.9	25.4	135.5	4.4	-3.1	11.5
16	66.7	170.2	78.6	52.4	189.5	7.8	-1.5	16.3
17	51.8	132.0	399.6	36.6	466.0	29.1	29.7	.0
18	44.6	113.9	2855.0	48.8	2907.5	13.1	13.1	.0
19	28.0	71.4	605.4	21.7	650.9	4.2	.4	.1
20	38.8	98.8	135.5	28.0	194.9	11.4	-4.3	25.7
21	59.6	152.1	189.5	49.7	250.1	43.7	-6.3	53.0
22	16.9	43.2	.0	10.2	30.6	2.4	3.5	.0
23	40.3	102.8	.0	23.7	67.8	11.3	9.0	12.4
24	55.3	141.0	2907.5	60.4	2979.7	9.0	4.4	.0
25	39.3	100.2	651.0	30.5	712.1	8.6	10.1	.0
26	72.2	184.0	225.5	50.8	310.5	48.2	15.3	47.4
27	54.7	139.4	67.8	39.1	161.3	6.8	-43.7	60.3
TOTAL	2512.4	7067.1	15574.9	1945.9	20454.5	306.7	142.0	226.7

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1982
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	4057.9	.0	883.5	3152.8	.0	.0	.0
2	5.2	15.0	.0	2.9	12.0	.0	.0	.0
3	160.4	504.9	.0	92.8	411.6	.3	.0	.0
4	66.5	209.5	.0	38.5	170.9	.1	.0	.0
5	59.0	168.8	411.6	44.2	523.2	13.1	12.8	.0
6	20.1	57.6	.0	13.4	35.5	8.8	8.7	.0
7	111.1	318.0	170.9	77.6	376.7	34.7	33.8	.0
8	48.4	138.4	3152.8	52.0	3225.7	13.3	12.3	.0
9	56.5	161.7	535.2	39.8	646.3	10.8	10.5	.0
10	41.3	118.3	.0	26.1	83.9	8.3	8.5	.0
11	28.8	82.3	35.5	18.9	93.8	5.0	5.0	.0
12	48.8	139.7	376.7	35.8	478.7	1.9	1.7	.1
13	41.3	118.2	3225.7	44.4	3290.6	8.8	8.3	.0
14	37.8	108.2	646.3	27.1	717.1	10.2	10.2	.0
15	37.4	107.1	83.9	24.0	162.5	4.4	-4.6	12.5
16	66.7	191.0	93.8	48.7	227.4	8.7	-7.3	17.9
17	51.8	148.2	478.7	35.7	557.3	33.8	33.6	.0
18	44.6	127.8	3290.6	48.0	3356.3	13.9	13.5	.0
19	28.0	80.2	717.1	20.6	772.0	4.8	1.8	.1
20	38.8	110.9	162.5	26.8	234.2	12.5	-6.9	27.9
21	59.6	170.7	227.4	45.1	297.2	55.1	-2.6	57.6
22	16.9	48.5	.0	9.8	36.2	2.5	3.9	.0
23	40.3	115.4	.0	22.2	80.9	12.3	5.9	13.5
24	55.3	158.3	3356.3	58.3	3446.7	9.4	4.6	.0
25	39.3	112.5	772.1	29.0	845.6	9.9	9.3	.0
26	72.2	206.5	270.4	49.4	371.8	55.7	.8	51.5
27	54.7	156.4	80.9	36.9	193.3	7.0	-59.0	65.8
TOTAL	2512.4	7931.8	18088.3	1851.4	23800.1	345.0	104.9	246.8

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1983
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3551.7	.0	937.3	2593.1	.0	.0	.0
2	5.2	13.1	.0	3.4	9.6	.0	.0	.0
3	160.4	441.9	.0	106.3	334.2	.3	.0	.0
4	66.5	183.3	.0	44.1	138.7	.1	.0	.0
5	59.0	147.8	334.2	46.2	422.2	13.1	13.3	.0
6	20.1	50.5	.0	14.7	24.6	11.0	11.0	.0
7	111.1	278.3	138.7	83.3	291.6	41.5	41.1	.0
8	48.4	121.2	2593.1	53.2	2649.0	11.7	11.7	.0
9	56.5	141.6	431.9	42.6	519.4	11.2	11.1	.0
10	41.3	103.5	.0	29.2	64.6	9.5	9.2	.0
11	28.8	72.0	24.6	20.8	70.0	5.7	5.6	.0
12	48.8	122.3	291.6	37.8	374.0	1.8	1.7	.1
13	41.3	103.4	2649.0	45.5	2698.9	7.9	7.8	.0
14	37.8	94.7	519.4	29.0	574.9	10.0	10.0	.0
15	37.4	93.7	64.6	26.8	125.9	5.4	-5.7	10.6
16	66.7	167.2	70.0	53.0	174.7	9.2	-9.0	15.3
17	51.8	129.7	374.0	38.7	427.0	37.7	37.6	.0
18	44.6	111.8	2698.9	49.2	2748.7	12.6	12.6	.0
19	28.0	70.2	574.9	21.8	618.7	4.4	3.1	.1
20	38.8	97.1	125.9	29.0	179.3	14.5	-8.5	23.6
21	59.6	149.4	174.7	49.2	216.9	57.4	8.2	49.0
22	16.9	42.4	.0	11.3	28.3	2.8	3.5	.0
23	40.3	101.0	.0	26.0	62.8	12.1	2.9	11.5
24	55.3	138.5	2748.7	59.7	2818.7	8.4	8.0	.0
25	39.3	98.4	618.7	30.7	676.9	9.4	9.3	.0
26	72.2	180.7	207.5	53.7	268.2	66.1	20.1	43.7
27	54.7	136.9	62.8	39.8	151.2	8.4	-50.6	55.8
TOTAL	2512.4	6942.4	14703.3	1982.1	19262.2	372.2	154.1	209.7

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1984
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	5070.2	.0	981.6	4074.8	.0	.0	.0
2	5.2	18.7	.0	3.6	15.1	.0	.0	.0
3	160.4	630.9	.0	113.6	517.9	.3	.0	.0
4	66.5	261.7	.0	47.1	215.0	.1	.0	.0
5	59.0	210.9	517.9	49.9	662.6	16.7	15.1	.0
6	20.1	72.0	.0	15.4	45.0	11.8	11.7	.0
7	111.1	397.3	215.0	88.2	479.7	45.0	44.3	.0
8	48.4	173.0	4074.8	53.2	4178.6	15.8	13.6	.0
9	56.5	202.1	677.8	44.9	821.6	13.7	13.4	.0
10	41.3	147.8	.0	31.3	105.5	11.2	10.8	.0
11	28.8	102.8	45.0	21.9	119.3	6.7	6.7	.0
12	48.8	174.6	479.7	39.8	612.5	2.2	2.0	.1
13	41.3	147.7	4178.6	45.4	4270.5	10.3	9.0	.0
14	37.8	135.2	821.6	30.2	914.2	12.5	10.6	.0
15	37.4	133.8	105.5	28.6	204.6	6.2	-7.0	9.9
16	66.7	238.7	119.3	54.9	293.1	9.8	-6.6	14.1
17	51.8	185.1	612.5	40.4	714.5	43.0	40.2	.0
18	44.6	159.7	4270.5	49.1	4365.1	15.9	14.4	.0
19	28.0	100.2	914.3	22.8	986.1	5.7	1.0	.1
20	38.8	138.6	204.6	30.0	298.1	15.4	-8.7	22.7
21	59.6	213.3	293.1	50.8	388.4	66.8	19.0	47.4
22	16.9	60.6	.0	11.9	45.5	3.2	3.3	.0
23	40.3	144.2	.0	27.6	100.9	15.8	2.4	10.7
24	55.3	197.8	4365.2	59.6	4491.8	11.6	5.9	.0
25	39.3	140.5	986.2	32.0	1083.7	11.3	10.8	.0
26	72.2	258.0	343.6	55.1	476.8	70.0	26.1	41.9
27	54.7	195.4	100.9	42.5	244.7	9.4	-46.3	54.1
TOTAL	2512.4	9910.6	23326.2	2071.4	30725.7	430.5	192.0	200.8

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1985
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	4151.5	.0	1009.0	3059.8	.0	.0	.0
2	5.2	15.3	.0	3.9	11.3	.0	.0	.0
3	160.4	516.6	.0	121.6	391.4	.3	.0	.0
4	66.5	214.3	.0	50.4	162.5	.1	.0	.0
5	59.0	172.7	391.4	51.6	493.3	15.9	15.6	.0
6	20.1	59.0	.0	16.3	29.7	12.5	12.3	.0
7	111.1	325.3	162.5	92.2	344.4	47.6	46.2	.0
8	48.4	141.6	3069.8	53.8	3143.9	13.1	12.9	.0
9	56.5	165.5	504.7	47.2	608.2	13.1	12.7	.0
10	41.3	121.0	.0	32.8	76.0	11.1	10.7	.0
11	28.8	84.2	29.7	23.2	83.3	6.7	6.6	.0
12	48.8	142.9	344.4	41.8	442.0	2.2	1.9	.1
13	41.3	120.9	3143.9	45.9	3209.7	8.7	8.6	.0
14	37.8	110.7	608.2	31.7	674.5	11.6	11.2	.0
15	37.4	109.5	76.0	30.0	148.0	6.5	-4.7	8.1
16	66.7	195.4	83.3	56.3	209.0	9.9	-4.3	11.5
17	51.8	151.6	442.0	42.6	508.2	41.4	40.8	.0
18	44.6	130.7	3209.7	49.7	3276.2	13.8	13.7	.0
19	28.0	82.0	674.5	23.8	726.8	5.2	1.3	.1
20	38.8	113.5	148.0	31.8	212.3	16.4	-9.7	19.4
21	59.6	174.6	209.0	52.0	265.4	62.8	20.0	41.6
22	16.9	49.6	.0	12.7	33.4	3.2	3.1	.0
23	40.3	118.0	.0	29.9	73.4	14.0	2.6	8.7
24	55.3	161.9	3276.2	60.8	3366.9	9.5	7.0	.0
25	39.3	115.1	726.8	33.4	796.4	10.9	10.3	.0
26	72.2	211.3	245.6	58.8	320.2	75.9	34.1	35.8
27	54.7	160.0	73.4	44.7	177.4	9.7	-41.9	48.4
TOTAL	2512.4	8114.7	17419.3	2148.0	22853.7	422.0	211.0	173.6

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1986
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	2485.5	.0	909.3	1681.4	.0	.0	.0
2	5.2	9.2	.0	3.2	6.0	.0	.0	.0
3	160.4	309.3	.0	101.6	210.8	.3	.0	.0
4	66.5	128.3	.0	42.1	87.5	.1	.0	.0
5	59.0	103.4	210.8	45.7	258.3	13.4	14.8	.0
6	20.1	35.3	.0	14.1	13.4	8.4	8.6	.0
7	111.1	194.8	87.5	80.9	165.6	39.3	41.4	.0
8	48.4	84.8	1681.4	52.2	1705.9	9.2	9.4	.0
9	56.5	99.1	264.4	41.4	312.8	10.9	11.4	.0
10	41.3	72.4	.0	28.7	37.2	7.5	8.2	.0
11	28.8	50.4	13.4	20.0	39.3	5.3	5.5	.0
12	48.8	85.6	165.6	36.9	213.9	1.8	2.1	.1
13	41.3	72.4	1705.9	44.5	1728.1	6.5	6.7	.0
14	37.8	66.3	312.8	28.0	343.1	9.0	9.4	.0
15	37.4	65.6	37.2	26.4	72.2	5.3	-2.9	10.0
16	66.7	117.0	39.3	51.4	99.4	9.4	-2.2	14.1
17	51.8	90.7	213.9	37.4	241.0	27.6	28.1	.0
18	44.6	78.3	1728.1	48.1	1748.5	10.7	10.9	.0
19	28.0	49.1	343.1	21.1	368.0	3.9	3.0	.1
20	38.8	67.9	72.2	27.6	100.4	13.1	-7.0	23.1
21	59.6	104.6	99.4	47.3	117.6	43.7	-3.7	48.7
22	16.9	29.7	.0	10.6	17.5	2.0	2.8	.0
23	40.3	70.7	.0	24.9	37.8	8.7	3.2	10.7
24	55.3	96.9	1748.5	59.3	1780.9	6.5	6.9	.0
25	39.3	68.9	368.1	29.7	400.0	8.6	9.3	.0
26	72.2	126.5	117.8	50.7	144.2	51.4	15.1	42.8
27	54.7	95.8	37.8	39.0	87.9	8.3	-44.0	56.1
TOTAL	2512.4	4858.3	9247.1	1921.9	12018.6	310.9	137.0	205.6

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1987
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	2736.5	.0	933.4	1805.0	.0	.0	.0
2	5.2	10.1	.0	3.5	6.6	.0	.0	.0
3	160.4	340.5	.0	111.3	228.9	.3	.0	.0
4	66.5	141.3	.0	46.1	95.1	.1	.0	.0
5	59.0	113.8	228.9	46.7	284.0	12.0	12.0	.0
6	20.1	38.9	.0	14.5	15.9	8.5	8.4	.0
7	111.1	214.4	95.1	82.8	189.9	36.8	36.3	.0
8	48.4	93.3	1805.0	52.3	1836.5	9.6	9.6	.0
9	56.5	109.1	290.5	42.5	347.0	10.1	9.9	.0
10	41.3	79.7	.0	29.8	41.9	8.0	8.0	.0
11	28.8	55.5	15.9	20.7	45.7	5.1	5.1	.0
12	48.8	94.2	189.9	37.4	245.1	1.7	1.5	.1
13	41.3	79.7	1836.5	44.7	1865.0	6.6	6.6	.0
14	37.8	73.0	347.0	28.8	382.6	8.6	8.5	.0
15	37.4	72.2	41.9	27.2	81.8	5.1	-3.3	8.6
16	66.7	128.8	45.7	50.8	116.1	7.6	-4.6	12.2
17	51.8	99.9	245.1	38.3	279.0	27.7	27.6	.0
18	44.6	86.2	1865.0	48.3	1892.1	10.8	10.8	.0
19	28.0	54.1	382.6	21.7	411.3	3.8	3.0	.1
20	38.8	74.8	81.8	28.2	116.3	12.1	-7.0	20.1
21	59.6	115.1	116.1	46.7	141.7	42.6	-.1	42.5
22	16.9	32.7	.0	11.5	18.9	2.3	2.6	.0
23	40.3	77.8	.0	27.1	41.1	9.7	1.8	9.3
24	55.3	106.7	1892.1	58.3	1934.0	6.5	6.2	.0
25	39.3	75.8	411.3	30.5	448.4	8.2	8.0	.0
26	72.2	139.3	135.1	51.8	172.9	49.6	11.4	37.1
27	54.7	105.5	41.1	40.5	98.1	7.9	-42.7	49.2
TOTAL	2512.4	5348.8	10066.6	1975.2	13140.8	301.3	119.8	179.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1988
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3397.2	.0	1092.8	2286.4	.0	.0	.0
2	5.2	12.5	.0	3.8	8.7	.0	.0	.0
3	160.4	422.7	.0	118.5	303.9	.3	.0	.0
4	66.5	175.4	.0	49.1	126.2	.1	.0	.0
5	59.0	141.3	303.9	56.5	372.0	16.8	16.6	.0
6	20.1	48.3	.0	17.1	20.2	11.0	11.0	.0
7	111.1	266.2	126.2	99.5	244.0	48.8	49.6	.0
8	48.4	115.9	2286.4	52.3	2338.9	10.9	10.9	.0
9	56.5	135.4	380.7	51.6	451.0	13.5	13.5	.0
10	41.3	99.0	.0	34.6	54.2	10.2	10.0	.0
11	28.8	68.9	20.2	24.3	57.9	6.9	6.9	.0
12	48.8	117.0	244.0	45.2	313.5	2.3	2.3	.1
13	41.3	98.9	2338.9	44.6	2385.6	7.5	7.4	.0
14	37.8	90.6	451.0	35.1	495.0	11.5	11.4	.0
15	37.4	89.6	54.2	31.9	105.1	6.7	-2.5	8.1
16	66.7	159.9	57.9	60.9	146.0	10.7	-1.6	11.6
17	51.8	124.0	313.5	45.0	356.7	35.8	35.9	.0
18	44.6	107.0	2385.6	48.2	2432.0	12.2	12.1	.0
19	28.0	67.1	495.0	26.4	530.7	5.0	2.1	.1
20	38.8	92.8	105.1	33.5	147.8	16.6	-8.1	18.5
21	59.6	142.9	146.0	55.9	179.3	53.6	14.9	38.8
22	16.9	40.6	.0	12.6	25.3	2.7	2.2	.0
23	40.3	96.6	.0	29.1	55.1	12.4	1.6	8.7
24	55.3	132.5	2432.0	59.6	2496.7	8.1	7.0	.0
25	39.3	94.2	530.7	36.9	577.1	11.0	11.1	.0
26	72.2	172.9	173.2	61.5	219.4	65.1	31.9	34.1
27	54.7	130.9	55.1	48.1	127.7	10.3	-33.9	44.4
TOTAL	2512.4	6640.3	12899.6	2274.6	16856.4	389.9	212.4	164.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1989
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3673.7	.0	942.5	2735.0	.0	.0	.0
2	5.2	13.5	.0	3.5	10.0	.0	.0	.0
3	160.4	457.1	.0	109.4	347.5	.3	.0	.0
4	66.5	189.6	.0	45.4	144.2	.1	.0	.0
5	59.0	152.8	347.5	47.9	438.3	14.2	15.2	.0
6	20.1	52.2	.0	14.8	25.7	11.7	11.7	.0
7	111.1	287.9	144.2	85.1	304.7	42.3	42.5	.0
8	48.4	125.3	2735.0	54.6	2793.7	12.1	12.1	.0
9	56.5	146.4	448.3	44.2	538.4	12.1	12.3	.0
10	41.3	107.1	.0	30.0	66.9	10.2	10.3	.0
11	28.8	74.5	25.7	21.1	73.2	6.0	6.0	.0
12	48.8	126.5	304.7	38.9	390.3	2.0	1.9	.1
13	41.3	107.0	2793.7	46.6	2846.0	8.1	8.1	.0
14	37.8	97.9	538.4	30.3	595.2	10.8	10.9	.0
15	37.4	96.9	66.9	27.4	130.6	5.8	-3.6	9.6
16	66.7	172.9	73.2	53.4	183.8	9.2	-3.9	13.8
17	51.8	134.1	390.3	38.8	446.3	39.4	39.4	.0
18	44.6	115.7	2846.0	50.3	2898.8	12.6	12.6	.0
19	28.0	72.6	595.2	22.7	640.4	4.7	2.5	.1
20	38.8	100.4	130.6	29.1	187.2	14.7	-6.7	21.0
21	59.6	154.5	183.8	49.4	231.7	57.6	14.2	43.4
22	16.9	43.9	.0	11.5	29.2	3.1	2.5	.0
23	40.3	104.4	.0	27.1	64.8	12.6	2.2	10.3
24	55.3	143.3	2898.8	59.7	2973.8	8.6	8.3	.0
25	39.3	101.8	640.5	31.1	701.6	9.6	9.6	.0
26	72.2	186.9	216.5	53.4	281.7	68.3	29.6	38.7
27	54.7	141.6	64.8	41.3	156.3	8.8	-40.6	49.4
TOTAL	2512.4	7180.7	15444.1	2009.4	20235.5	384.8	197.3	186.4

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1990
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	6181.8	.0	1147.2	4963.0	.0	.0	.0
2	5.2	22.8	.0	4.5	18.3	.0	.0	.0
3	160.4	769.2	.0	138.1	630.6	.3	.0	.0
4	66.5	319.1	.0	57.3	261.7	.1	.0	.0
5	59.0	257.2	630.6	58.3	809.7	19.7	17.0	.0
6	20.1	87.8	.0	18.5	53.1	16.2	16.0	.0
7	111.1	484.4	261.7	105.4	585.8	54.9	53.1	.0
8	48.4	210.9	4963.0	55.9	5098.9	18.3	17.1	.0
9	56.5	246.4	828.1	54.2	1003.9	16.5	16.0	.0
10	41.3	180.2	.0	37.4	127.3	15.5	14.6	.0
11	28.8	125.4	53.1	26.3	144.1	8.1	7.9	.0
12	48.8	212.8	585.8	47.3	748.7	2.6	2.2	.1
13	41.3	180.1	5098.9	47.7	5219.0	11.7	10.7	.0
14	37.8	164.8	1003.9	36.1	1117.5	15.0	13.7	.0
15	37.4	163.1	127.3	34.1	248.6	7.6	-1.2	6.4
16	66.7	291.0	144.1	64.0	357.8	11.6	-1.1	9.3
17	51.8	225.7	748.7	48.2	869.4	56.8	55.3	.0
18	44.6	194.7	5219.0	51.6	5343.4	18.0	17.5	.0
19	28.0	122.2	1117.5	27.0	1205.9	6.8	-3.4	.1
20	38.8	168.9	248.6	36.1	362.1	19.3	-4.6	15.0
21	59.6	260.1	357.8	58.8	474.5	81.8	48.4	31.8
22	16.9	73.8	.0	14.6	54.3	4.9	2.6	.0
23	40.3	175.8	.0	34.4	121.3	20.1	2.3	7.0
24	55.3	241.1	5343.4	63.9	5506.1	13.9	3.3	.0
25	39.3	171.3	1206.0	38.0	1325.6	13.8	13.1	.0
26	72.2	314.6	416.5	67.0	571.6	92.4	57.2	27.7
27	54.7	238.3	121.3	51.2	296.9	11.5	-29.7	36.4
TOTAL	2512.4	12083.4	28475.2	2423.2	37518.9	537.6	328.0	133.8

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1991
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	4138.7	.0	914.9	3268.9	.0	.0	.0
2	5.2	15.3	.0	3.4	11.8	.0	.0	.0
3	160.4	515.0	.0	107.4	407.4	.3	.0	.0
4	66.5	213.6	.0	44.5	169.0	.1	.0	.0
5	59.0	172.2	407.4	45.5	519.6	14.5	15.2	.0
6	20.1	58.8	.0	14.4	32.4	11.9	12.0	.0
7	111.1	324.3	169.0	81.7	368.7	43.0	44.1	.0
8	48.4	141.2	3268.9	54.2	3342.7	13.6	13.7	.0
9	56.5	165.0	531.4	41.5	642.6	12.3	12.5	.0
10	41.3	120.6	.0	29.0	80.6	11.0	11.5	.0
11	28.8	83.9	32.4	20.5	89.7	6.2	6.3	.0
12	48.8	142.5	368.7	36.9	472.2	2.0	2.1	.1
13	41.3	120.5	3342.7	46.3	3408.3	9.0	9.2	.0
14	37.8	110.3	642.6	28.2	713.6	11.2	11.4	.0
15	37.4	109.2	80.6	26.4	157.5	5.9	-2.8	10.1
16	66.7	194.8	89.7	52.1	223.4	10.0	-2.1	14.5
17	51.8	151.1	472.2	37.7	543.7	42.0	42.2	.0
18	44.6	130.3	3408.3	50.1	3474.7	14.2	14.3	.0
19	28.0	81.8	713.6	21.3	769.1	5.0	1.4	.1
20	38.8	113.1	157.5	28.3	227.3	15.0	-4.4	21.9
21	59.6	174.1	223.4	48.3	288.0	62.7	18.7	45.0
22	16.9	49.4	.0	11.4	34.8	3.3	3.1	.0
23	40.3	117.7	.0	26.7	77.4	13.6	5.3	10.8
24	55.3	161.4	3474.7	60.8	3565.8	9.9	8.4	.0
25	39.3	114.7	769.1	30.0	843.6	10.3	10.6	.0
26	72.2	210.6	262.1	52.4	350.6	69.5	32.9	40.5
27	54.7	159.5	77.4	39.5	188.5	8.9	-38.3	51.0
TOTAL	2512.4	8089.8	18491.8	1953.5	24272.0	405.2	227.1	193.9

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1992
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	2380.6	.0	791.8	1631.2	.0	.0	.0
2	5.2	8.8	.0	2.8	5.9	.0	.0	.0
3	160.4	296.2	.0	89.9	206.1	.3	.0	.0
4	66.5	122.9	.0	37.3	85.6	.1	.0	.0
5	59.0	99.0	206.1	40.0	253.6	11.6	12.4	.0
6	20.1	33.8	.0	12.4	13.0	8.4	8.5	.0
7	111.1	186.5	85.6	71.1	166.2	34.9	35.8	.0
8	48.4	81.2	1631.2	51.6	1652.2	9.1	9.3	.0
9	56.5	94.9	259.5	36.7	307.8	10.0	10.2	.0
10	41.3	69.4	.0	25.4	36.8	7.2	7.9	.0
11	28.8	48.3	13.0	17.7	38.8	4.8	4.9	.0
12	48.8	82.0	166.2	32.3	214.3	1.6	1.8	.1
13	41.3	69.3	1652.2	44.1	1671.4	6.4	6.7	.0
14	37.8	63.5	307.8	25.0	337.9	8.3	8.6	.0
15	37.4	62.8	36.8	23.1	71.8	4.7	-3.4	10.6
16	66.7	112.1	38.8	44.7	99.1	7.7	-4.9	15.1
17	51.8	86.9	214.3	33.0	241.5	26.7	26.9	.0
18	44.6	75.0	1671.4	47.6	1688.7	10.4	10.6	.0
19	28.0	47.0	337.9	18.8	362.6	3.6	3.6	.1
20	38.8	65.1	71.8	24.3	100.8	11.7	-4.2	24.0
21	59.6	100.1	99.1	41.7	116.5	42.3	-6.9	50.1
22	16.9	28.4	.0	9.4	17.1	1.9	3.3	.0
23	40.3	67.7	.0	22.0	37.1	8.6	4.6	11.4
24	55.3	92.9	1688.7	57.2	1718.8	6.0	6.5	.0
25	39.3	66.0	362.6	26.4	394.6	7.6	8.0	.0
26	72.2	121.1	117.9	44.9	142.9	51.2	11.9	44.3
27	54.7	91.8	37.1	34.7	86.7	7.5	-46.9	57.5
TOTAL	2512.4	4653.2	8997.8	1705.9	11698.7	292.5	115.0	213.0

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1993
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3408.5	.0	985.3	2379.0	.0	.0	.0
2	5.2	12.6	.0	3.8	8.8	.0	.0	.0
3	160.4	424.1	.0	117.9	305.8	.3	.0	.0
4	66.5	175.9	.0	48.9	127.0	.1	.0	.0
5	59.0	141.8	305.8	49.3	384.1	14.2	13.9	.0
6	20.1	48.4	.0	15.6	21.5	11.3	11.1	.0
7	111.1	267.1	127.0	88.6	262.7	42.7	41.3	.0
8	48.4	116.3	2379.0	52.7	2430.9	11.2	11.0	.0
9	56.5	135.9	392.9	45.0	472.4	11.4	11.0	.0
10	41.3	99.3	.0	31.5	57.8	10.0	9.4	.0
11	28.8	69.1	21.5	22.1	62.6	5.9	5.8	.0
12	48.8	117.3	262.7	39.9	338.2	1.9	1.6	.1
13	41.3	99.3	2430.9	45.0	2477.2	7.6	7.4	.0
14	37.8	90.9	472.4	30.3	522.9	10.0	9.7	.0
15	37.4	89.9	57.8	28.7	113.2	5.8	-4.0	7.5
16	66.7	160.4	62.6	54.2	158.6	9.0	-5.1	10.7
17	51.8	124.4	338.2	40.8	385.7	36.1	35.8	.0
18	44.6	107.3	2477.2	48.7	2523.3	12.2	12.2	.0
19	28.0	67.4	522.9	22.9	563.0	4.4	2.9	.1
20	38.8	93.2	113.2	30.5	160.9	14.9	-6.5	17.5
21	59.6	143.4	158.6	49.7	196.2	54.1	15.5	37.2
22	16.9	40.7	.0	12.4	25.3	3.0	3.1	.0
23	40.3	96.9	.0	29.0	55.8	12.1	2.1	8.1
24	55.3	132.9	2523.3	59.3	2588.8	7.8	7.3	.0
25	39.3	94.5	563.0	32.3	615.7	9.5	9.0	.0
26	72.2	173.5	186.2	56.4	236.5	66.7	28.0	32.3
27	54.7	131.4	55.8	42.9	135.5	8.8	-39.2	42.9
TOTAL	2512.4	6662.5	13451.2	2084.0	17609.6	371.1	183.4	156.4

(4) Under Draft with Irrigation Water Demand <Water Demand x 1.50>

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1980
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3689.2	.0	993.6	2700.1	.0	.0	.0
2	5.2	13.6	.0	3.7	9.9	.0	.0	.0
3	160.4	459.1	.0	116.7	342.0	.3	.0	.0
4	66.5	190.4	.0	48.4	142.0	.1	.0	.0
5	59.0	153.5	342.0	50.0	430.8	14.8	14.9	.0
6	20.1	52.4	.0	15.6	26.2	10.6	10.7	.0
7	111.1	289.1	142.0	89.9	297.7	43.4	43.2	.0
8	48.4	125.8	2700.1	53.9	2760.0	12.1	12.1	.0
9	56.5	147.0	440.7	46.2	528.9	12.6	12.5	.0
10	41.3	107.5	.0	32.1	65.3	10.1	10.0	.0
11	28.8	74.8	26.2	22.3	72.7	6.0	6.0	.0
12	48.8	127.0	297.7	40.7	381.9	2.1	2.0	.1
13	41.3	107.5	2760.0	46.0	2813.4	8.1	8.1	.0
14	37.8	98.4	528.9	31.3	585.0	11.0	10.9	.0
15	37.4	97.3	65.3	29.3	127.4	5.9	-5.6	9.5
16	66.7	173.7	72.7	55.4	182.2	9.2	-5.1	13.5
17	51.8	134.7	381.9	41.1	439.4	36.2	36.1	.0
18	44.6	116.2	2813.4	49.7	2866.9	13.0	13.0	.0
19	28.0	72.9	585.0	23.5	629.5	4.8	1.5	.1
20	38.8	100.8	127.4	30.7	183.1	14.4	-9.3	21.4
21	59.6	155.2	182.2	51.0	232.6	54.5	9.2	45.1
22	16.9	44.1	.0	12.2	28.8	3.0	3.0	.0
23	40.3	104.9	.0	28.8	63.5	12.6	1.0	9.7
24	55.3	143.9	2866.9	60.8	2941.3	8.7	6.7	.0
25	39.3	102.3	629.6	32.9	689.2	9.8	9.7	.0
26	72.2	187.7	211.9	56.0	280.6	63.0	23.2	39.6
27	54.7	142.2	63.5	43.7	152.9	9.1	-44.0	52.0
TOTAL	2512.4	7211.2	15237.3	2105.5	19973.1	375.5	169.6	190.9

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1981
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3615.5	.0	931.8	2743.9	.0	.0	.0
2	5.2	13.3	.0	3.0	10.3	.0	.0	.0
3	160.4	449.9	.0	97.3	352.6	.3	.0	.0
4	66.5	186.6	.0	40.3	146.2	.1	.0	.0
5	59.0	150.4	352.6	47.0	443.7	12.3	14.2	.0
6	20.1	51.4	.0	14.0	29.5	7.9	8.2	.0
7	111.1	283.3	146.2	82.4	314.5	32.6	35.9	.0
8	48.4	123.3	2743.9	52.8	2803.0	12.2	12.1	.0
9	56.5	144.1	454.0	41.4	546.8	9.9	10.7	.0
10	41.3	105.4	.0	27.6	69.9	7.9	8.7	.0
11	28.8	73.3	29.5	19.5	78.6	4.7	4.9	.0
12	48.8	124.5	314.5	37.7	399.6	1.7	2.2	.1
13	41.3	105.3	2803.0	45.1	2855.5	8.2	8.4	.0
14	37.8	96.4	546.8	28.6	605.4	9.3	10.0	.0
15	37.4	95.4	69.9	25.4	135.5	4.4	-4.2	14.0
16	66.7	170.2	78.6	52.4	189.5	7.8	-4.5	19.9
17	51.8	132.0	399.6	36.6	466.0	29.1	29.7	.0
18	44.6	113.9	2855.5	48.8	2908.0	13.1	13.2	.0
19	28.0	71.4	605.4	21.7	650.9	4.2	.7	.1
20	38.8	98.8	135.5	28.0	194.9	11.4	-9.1	31.4
21	59.6	152.1	189.5	49.7	250.1	43.7	-16.5	64.7
22	16.9	43.2	.0	10.2	30.6	2.4	2.9	.0
23	40.3	102.8	.0	23.7	67.8	11.3	2.8	15.1
24	55.3	141.0	2908.0	60.4	2980.2	9.0	4.6	.0
25	39.3	100.2	651.0	30.5	712.1	8.6	10.5	.0
26	72.2	184.0	225.5	50.8	310.5	48.2	6.3	58.0
27	54.7	139.4	67.8	39.1	161.3	6.8	-56.2	74.0
TOTAL	2512.4	7067.1	15577.0	1945.9	20457.1	306.7	95.8	277.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1982
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	4057.9	.0	883.5	3152.8	.0	.0	.0
2	5.2	15.0	.0	2.9	12.0	.0	.0	.0
3	160.4	504.9	.0	92.8	411.6	.3	.0	.0
4	66.5	209.5	.0	38.5	170.9	.1	.0	.0
5	59.0	168.8	411.6	44.2	523.2	13.1	12.8	.0
6	20.1	57.6	.0	13.4	35.5	8.8	8.7	.0
7	111.1	316.0	170.9	77.6	376.7	34.7	33.8	.0
8	48.4	138.4	3152.8	52.0	3225.7	13.3	12.3	.0
9	56.5	161.7	535.2	39.8	646.3	10.8	10.5	.0
10	41.3	118.3	.0	26.1	83.9	8.3	8.5	.0
11	28.8	82.3	35.5	18.9	93.8	5.0	5.0	.0
12	48.8	139.7	376.7	35.8	478.7	1.9	1.7	.1
13	41.3	118.2	3225.7	44.4	3290.6	8.8	8.3	.0
14	37.8	108.2	646.3	27.1	717.1	10.2	10.2	.0
15	37.4	107.1	83.9	24.0	162.5	4.4	-5.5	15.3
16	66.7	191.0	93.8	48.7	227.4	8.7	-7.9	21.7
17	51.8	148.2	478.7	35.7	557.3	33.8	33.6	.0
18	44.6	127.8	3290.6	48.0	3356.3	13.9	13.6	.0
19	28.0	80.2	717.1	20.6	772.0	4.8	2.2	.1
20	38.8	110.9	162.5	26.8	234.2	12.5	-9.5	25.6
21	59.6	170.7	227.4	45.1	297.2	55.1	-16.8	69.8
22	16.9	48.5	.0	9.8	36.2	2.5	2.6	.0
23	40.3	115.4	.0	22.2	80.9	12.3	2.1	12.8
24	55.3	158.3	3356.3	58.3	3446.7	9.4	5.0	.0
25	39.3	112.5	772.0	29.0	845.6	9.9	9.2	.0
26	72.2	206.5	270.4	49.4	371.8	55.7	-9.9	63.1
27	54.7	156.4	80.9	36.9	193.3	7.0	-72.7	79.9
TOTAL	2512.4	7931.8	18088.4	1851.4	23800.2	345.1	57.7	288.3

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1983
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3551.7	.0	937.3	2593.1	.0	.0	.0
2	5.2	13.1	.0	3.4	9.6	.0	.0	.0
3	160.4	441.9	.0	106.3	334.2	.3	.0	.0
4	66.5	183.3	.0	44.1	138.7	.1	.0	.0
5	59.0	147.8	334.2	46.2	422.2	13.1	13.3	.0
6	20.1	50.5	.0	14.7	24.6	11.0	11.0	.0
7	111.1	278.3	138.7	83.3	291.6	41.5	41.1	.0
8	48.4	121.2	2593.1	53.2	2649.0	11.7	11.7	.0
9	56.5	141.6	431.9	42.6	519.4	11.2	11.1	.0
10	41.3	103.5	.0	29.2	64.6	9.5	9.2	.0
11	28.8	72.0	24.6	20.8	70.0	5.7	5.6	.0
12	48.8	122.3	291.6	37.8	374.0	1.8	1.7	.1
13	41.3	103.4	2649.0	45.5	2698.9	7.9	7.8	.0
14	37.8	94.7	519.4	29.0	574.9	10.0	10.0	.0
15	37.4	93.7	64.6	26.8	125.9	5.4	-7.2	13.0
16	66.7	167.2	70.0	53.0	174.7	9.2	-11.2	18.5
17	51.8	129.7	374.0	38.7	427.0	37.7	37.6	.0
18	44.6	111.8	2698.9	49.2	2748.7	12.6	12.6	.0
19	28.0	70.2	574.9	21.8	618.7	4.5	3.3	.1
20	38.8	97.1	125.9	29.0	179.3	14.5	-9.5	21.9
21	59.6	149.4	174.7	49.2	216.9	57.4	-3.0	59.9
22	16.9	42.4	.0	11.3	28.3	2.8	2.6	.0
23	40.3	101.0	.0	26.0	62.8	12.1	.5	9.9
24	55.3	138.5	2748.7	59.7	2818.7	8.4	8.0	.0
25	39.3	98.4	618.7	30.7	676.9	9.4	9.1	.0
26	72.2	180.7	207.5	53.7	268.2	66.1	7.5	53.5
27	54.7	136.9	62.8	39.8	151.2	8.4	-64.2	68.3
TOTAL	2512.4	6942.4	14703.3	1982.1	19262.2	372.2	108.6	245.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1984
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	5070.2	.0	981.6	4074.8	.0	.0	.0
2	5.2	18.7	.0	3.6	15.1	.0	.0	.0
3	160.4	630.9	.0	113.6	517.9	.3	.0	.0
4	66.5	261.7	.0	47.1	215.0	.1	.0	.0
5	59.0	210.9	517.9	49.9	662.6	16.7	15.1	.0
6	20.1	72.0	.0	15.4	45.0	11.8	11.7	.0
7	111.1	397.3	215.0	88.2	479.7	45.0	44.3	.0
8	48.4	173.0	4074.8	53.2	4178.6	15.8	13.6	.0
9	56.5	202.1	677.8	44.9	821.6	13.7	13.4	.0
10	41.3	147.8	.0	31.3	105.5	11.2	10.9	.0
11	28.8	102.8	45.0	21.9	119.3	6.7	6.7	.0
12	48.8	174.6	479.7	39.8	612.5	2.2	2.0	.1
13	41.3	147.7	4178.6	45.4	4270.5	10.3	9.0	.0
14	37.8	135.2	821.6	30.2	914.2	12.5	10.7	.0
15	37.4	133.8	105.5	28.6	204.6	6.2	-8.8	12.2
16	66.7	238.7	119.3	54.9	293.1	9.8	-12.5	17.2
17	51.8	185.1	612.5	40.4	714.5	43.0	40.3	.0
18	44.6	159.7	4270.5	49.1	4365.1	15.9	14.4	.0
19	28.0	100.2	914.3	22.8	986.1	5.7	1.3	.1
20	38.8	138.6	204.6	30.0	298.1	15.4	-9.8	23.2
21	59.6	213.3	293.1	50.8	388.4	66.8	8.2	58.1
22	16.9	60.6	.0	11.9	45.5	3.2	2.8	.0
23	40.3	144.2	.0	27.6	100.9	15.8	.9	10.5
24	55.3	197.8	4365.2	59.6	4491.8	11.6	5.9	.0
25	39.3	140.5	986.2	32.0	1083.6	11.3	10.8	.0
26	72.2	258.0	343.6	55.1	476.8	70.0	15.8	51.6
27	54.7	195.4	100.9	42.5	244.7	9.4	-59.1	66.6
TOTAL	2512.4	9910.6	23326.2	2071.4	30725.7	430.5	147.6	239.7

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1985
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	4151.5	.0	1009.0	3069.8	.0	.0	.0
2	5.2	15.3	.0	3.9	11.3	.0	.0	.0
3	160.4	516.6	.0	121.6	391.4	.3	.0	.0
4	66.5	214.3	.0	50.4	162.5	.1	.0	.0
5	59.0	172.7	391.4	51.6	493.3	15.9	15.6	.0
6	20.1	59.0	.0	16.3	29.7	12.5	12.3	.0
7	111.1	325.3	162.5	92.2	344.4	47.6	46.2	.0
8	48.4	141.6	3069.8	53.8	3143.9	13.1	12.9	.0
9	56.5	165.5	504.7	47.2	608.2	13.1	12.7	.0
10	41.3	121.0	.0	32.8	76.0	11.1	10.7	.0
11	28.8	84.2	29.7	23.2	83.3	6.7	6.5	.0
12	48.8	142.9	344.4	41.8	442.0	2.2	1.9	.1
13	41.3	120.9	3143.9	45.9	3209.7	8.7	8.6	.0
14	37.8	110.7	608.2	31.7	674.5	11.6	11.2	.0
15	37.4	109.5	76.0	30.0	148.0	6.5	-7.9	10.1
16	66.7	195.4	83.3	56.3	209.0	9.9	-9.4	14.1
17	51.8	151.6	442.0	42.6	508.2	41.4	40.8	.0
18	44.6	130.7	3209.7	49.7	3276.2	13.8	13.7	.0
19	28.0	82.0	674.5	23.8	726.8	5.2	1.8	.1
20	38.8	113.5	148.0	31.8	212.3	16.4	-10.3	21.7
21	59.6	174.6	209.0	52.0	265.4	62.8	9.6	51.9
22	16.9	49.6	.0	12.7	33.4	3.2	3.0	.0
23	40.3	118.0	.0	29.9	73.4	14.0	1.2	10.1
24	55.3	161.9	3276.2	60.8	3366.9	9.5	7.1	.0
25	39.3	115.1	726.8	33.4	796.4	10.9	10.2	.0
26	72.2	211.3	245.6	58.8	320.2	75.9	23.8	44.9
27	54.7	160.0	73.4	44.7	177.4	9.7	-54.3	60.4
TOTAL	2512.4	8114.7	17419.3	2148.0	22853.7	422.0	167.9	213.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1986
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	2485.5	.0	909.3	1681.4	.0	.0	.0
2	5.2	9.2	.0	3.2	6.0	.0	.0	.0
3	160.4	309.3	.0	101.6	210.8	.3	.0	.0
4	66.5	128.3	.0	42.1	87.5	.1	.0	.0
5	59.0	103.4	210.8	45.7	258.3	13.4	14.8	.0
6	20.1	35.3	.0	14.1	13.4	8.4	8.6	.0
7	111.1	194.8	87.5	80.9	165.6	39.3	41.4	.0
8	48.4	84.8	1681.4	52.2	1705.9	9.2	9.4	.0
9	56.5	99.1	264.4	41.4	312.8	10.9	11.4	.0
10	41.3	72.4	.0	28.7	37.2	7.5	8.1	.0
11	28.8	50.4	13.4	20.0	39.3	5.3	5.5	.0
12	48.8	85.6	165.6	36.9	213.9	1.8	2.1	.1
13	41.3	72.4	1705.9	44.5	1728.1	6.5	6.7	.0
14	37.8	66.3	312.8	28.0	343.1	9.0	9.4	.0
15	37.4	65.6	37.2	26.4	72.2	5.3	-4.7	12.3
16	66.7	117.0	39.3	51.4	99.4	9.4	-5.2	17.3
17	51.8	90.7	213.9	37.4	241.0	27.6	28.1	.0
18	44.6	78.3	1728.1	48.1	1748.5	10.7	10.9	.0
19	28.0	49.1	343.1	21.1	368.0	3.9	3.2	.1
20	38.8	67.9	72.2	27.6	100.4	13.1	-10.0	28.5
21	59.6	104.6	99.4	47.3	117.6	43.7	-15.0	60.1
22	16.9	29.7	.0	10.6	17.5	2.0	2.8	.0
23	40.3	70.7	.0	24.9	37.8	8.7	1.8	13.0
24	55.3	96.9	1748.5	59.3	1780.9	6.5	6.9	.0
25	39.3	68.9	368.0	29.7	399.9	8.6	9.4	.0
26	72.2	126.5	117.8	50.7	144.2	51.4	6.6	52.9
27	54.7	95.8	37.8	39.0	87.9	8.3	-56.7	69.5
TOTAL	2512.4	4858.3	9247.1	1921.9	12018.6	310.9	95.6	253.8

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1987
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	2736.5	.0	933.4	1805.0	.0	.0	.0
2	5.2	10.1	.0	3.5	6.6	.0	.0	.0
3	160.4	340.5	.0	111.3	228.9	.3	.0	.0
4	66.5	141.3	.0	46.1	95.1	.1	.0	.0
5	59.0	113.8	228.9	46.7	284.0	12.0	12.0	.0
6	20.1	38.9	.0	14.5	15.9	8.5	8.4	.0
7	111.1	214.4	95.1	82.8	189.9	36.8	36.3	.0
8	48.4	93.3	1805.0	52.3	1836.5	9.6	9.6	.0
9	56.5	109.1	290.5	42.5	347.0	10.1	9.9	.0
10	41.3	79.7	.0	29.8	41.9	8.0	8.0	.0
11	28.8	55.5	15.9	20.7	45.7	5.1	5.1	.0
12	48.8	94.2	189.9	37.4	245.1	1.7	1.5	.1
13	41.3	79.7	1836.5	44.7	1865.0	6.6	6.6	.0
14	37.8	73.0	347.0	28.8	382.6	8.6	8.5	.0
15	37.4	72.2	41.9	27.2	81.8	5.1	-4.9	10.6
16	66.7	128.8	45.7	50.8	116.1	7.6	-6.6	15.0
17	51.8	99.9	245.1	38.3	279.0	27.7	27.6	.0
18	44.6	86.2	1865.0	48.3	1892.1	10.8	10.8	.0
19	28.0	54.1	382.6	21.7	411.3	3.8	3.2	.1
20	38.8	74.8	81.8	28.2	116.3	12.1	-9.7	21.6
21	59.6	115.1	116.1	46.7	141.7	42.6	-10.6	52.8
22	16.9	32.7	.0	11.5	18.9	2.3	2.5	.0
23	40.3	77.8	.0	27.1	41.1	9.7	.5	9.2
24	55.3	106.7	1892.1	58.3	1934.0	6.5	6.4	.0
25	39.3	75.8	411.3	30.5	448.4	8.2	8.0	.0
26	72.2	139.3	135.1	51.8	172.9	49.6	2.6	46.0
27	54.7	105.5	41.1	40.5	98.1	7.9	-55.3	61.7
TOTAL	2512.4	5348.8	10066.5	1975.2	13140.7	301.3	80.5	217.1

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1988
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3397.2	.0	1092.8	2286.4	.0	.0	.0
2	5.2	12.5	.0	3.8	8.7	.0	.0	.0
3	160.4	422.7	.0	118.5	303.9	.3	.0	.0
4	66.5	175.4	.0	49.1	126.2	.1	.0	.0
5	59.0	141.3	303.9	56.5	372.0	16.8	16.6	.0
6	20.1	48.3	.0	17.1	20.2	11.0	11.0	.0
7	111.1	266.2	126.2	99.5	244.0	48.8	49.6	.0
8	48.4	115.9	2286.4	52.3	2338.9	10.9	10.9	.0
9	56.5	135.4	380.7	51.6	451.0	13.5	13.5	.0
10	41.3	99.0	.0	34.6	54.2	10.2	10.0	.0
11	28.8	68.9	20.2	24.3	57.9	6.9	6.9	.0
12	48.8	117.0	244.0	45.2	313.5	2.3	2.3	.1
13	41.3	98.9	2338.9	44.6	2385.6	7.5	7.4	.0
14	37.8	90.6	451.0	35.1	495.0	11.5	11.4	.0
15	37.4	89.6	54.2	31.9	105.1	6.7	-6.4	9.9
16	66.7	159.9	57.9	60.9	146.0	10.7	-5.3	14.1
17	51.8	124.0	313.5	45.0	356.7	35.8	35.9	.0
18	44.6	107.0	2385.6	48.2	2432.0	12.2	12.1	.0
19	28.0	67.1	495.0	26.4	530.7	5.0	2.5	.1
20	38.8	92.8	105.1	33.5	147.8	16.6	-9.9	22.8
21	59.6	142.9	146.0	55.9	179.3	53.6	5.9	47.8
22	16.9	40.6	.0	12.6	25.3	2.7	2.6	.0
23	40.3	96.6	.0	29.1	55.1	12.4	.3	9.8
24	55.3	132.5	2432.0	59.6	2496.7	8.1	7.0	.0
25	39.3	94.2	530.7	36.9	577.0	11.0	11.2	.0
26	72.2	172.9	173.2	61.5	219.4	65.1	23.9	42.1
27	54.7	130.9	55.1	48.1	127.7	10.3	-44.7	54.9
TOTAL	2512.4	6640.3	12899.6	2274.6	16856.3	389.9	174.6	201.4

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1989
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3673.7	.0	942.5	2735.0	.0	.0	.0
2	5.2	13.5	.0	3.5	10.0	.0	.0	.0
3	160.4	457.1	.0	109.4	347.5	.3	.0	.0
4	66.5	189.6	.0	45.4	144.2	.1	.0	.0
5	59.0	152.8	347.5	47.9	438.3	14.2	15.2	.0
6	20.1	52.2	.0	14.8	25.7	11.7	11.7	.0
7	111.1	287.9	144.2	85.1	304.7	42.3	42.5	.0
8	48.4	125.3	2735.0	54.6	2793.7	12.1	12.1	.0
9	56.5	146.4	448.3	44.2	538.4	12.1	12.3	.0
10	41.3	107.1	.0	30.0	66.9	10.2	10.2	.0
11	28.8	74.5	25.7	21.1	73.2	6.0	6.0	.0
12	48.8	126.5	304.7	38.9	390.3	2.0	1.9	.1
13	41.3	107.0	2793.7	46.6	2846.0	8.1	8.1	.0
14	37.8	97.9	538.4	30.3	595.2	10.8	10.9	.0
15	37.4	96.9	66.9	27.4	130.6	5.8	-6.3	11.6
16	66.7	172.9	73.2	53.4	183.8	9.2	-6.8	16.7
17	51.8	134.1	390.3	38.8	446.3	39.4	39.4	.0
18	44.6	115.7	2846.0	50.3	2898.8	12.6	12.6	.0
19	28.0	72.6	595.2	22.7	640.4	4.7	2.9	.1
20	38.8	100.4	130.6	29.1	187.2	14.7	-9.7	24.2
21	59.6	154.5	183.8	49.4	231.7	57.6	4.5	53.1
22	16.9	43.9	.0	11.5	29.2	3.1	2.8	.0
23	40.3	104.4	.0	27.1	64.8	12.6	1.3	10.4
24	55.3	143.3	2898.8	59.7	2973.8	8.6	8.4	.0
25	39.3	101.8	640.5	31.1	701.6	9.6	9.6	.0
26	72.2	186.9	216.5	53.4	281.7	68.3	20.8	47.4
27	54.7	141.6	64.8	41.3	156.3	8.8	-52.0	61.0
TOTAL	2512.4	7180.7	15444.1	2009.4	20235.4	384.9	158.5	224.5

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1990
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	6181.8	.0	1147.2	4963.0	.0	.0	.0
2	5.2	22.8	.0	4.5	18.3	.0	.0	.0
3	160.4	769.2	.0	138.1	630.6	.3	.0	.0
4	66.5	319.1	.0	57.3	261.7	.1	.0	.0
5	59.0	257.2	630.6	58.3	809.7	19.7	17.0	.0
6	20.1	87.8	.0	18.5	53.1	16.2	16.0	.0
7	111.1	484.4	261.7	105.4	585.8	54.9	53.1	.0
8	48.4	210.9	4963.0	55.9	5098.9	18.3	17.1	.0
9	56.5	246.4	828.1	54.2	1003.9	16.5	16.0	.0
10	41.3	180.2	.0	37.4	127.3	15.5	14.5	.0
11	28.8	125.4	53.1	26.3	144.1	8.1	7.9	.0
12	48.8	212.8	585.8	47.3	748.7	2.6	2.2	.1
13	41.3	180.1	5098.9	47.7	5219.0	11.7	10.7	.0
14	37.8	164.8	1003.9	36.1	1117.5	15.0	13.7	.0
15	37.4	163.1	127.3	34.1	248.6	7.7	-5.7	8.0
16	66.7	291.0	144.1	64.0	357.8	11.6	-3.9	11.3
17	51.8	225.7	748.7	48.2	869.4	56.8	55.3	.0
18	44.6	194.7	5219.0	51.6	5343.4	18.0	17.5	.0
19	28.0	122.2	1117.5	27.0	1205.8	6.8	-3.0	.1
20	38.8	168.9	248.6	36.1	362.1	19.3	-13.5	18.6
21	59.6	260.1	357.8	58.8	474.5	81.8	40.7	39.3
22	16.9	73.8	.0	14.6	54.3	4.9	3.1	.0
23	40.3	175.8	.0	34.4	121.3	20.1	1.1	8.2
24	55.3	241.1	5343.4	63.9	5506.1	13.9	3.4	.0
25	39.3	171.3	1206.0	38.0	1325.6	13.8	13.0	.0
26	72.2	314.6	416.4	67.0	571.6	92.4	49.3	34.3
27	54.7	238.3	121.3	51.2	296.9	11.5	-39.6	45.4
TOTAL	2512.4	12083.4	28475.2	2423.2	37518.9	537.6	286.0	165.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1991
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	4138.7	.0	914.9	3268.9	.0	.0	.0
2	5.2	15.3	.0	3.4	11.8	.0	.0	.0
3	160.4	515.0	.0	107.4	407.4	.3	.0	.0
4	66.5	213.6	.0	44.5	169.0	.1	.0	.0
5	59.0	172.2	407.4	45.5	519.6	14.5	15.2	.0
6	20.1	58.8	.0	14.4	32.4	11.9	12.0	.0
7	111.1	324.3	169.0	81.7	368.7	43.0	44.1	.0
8	48.4	141.2	3268.9	54.2	3342.7	13.6	13.7	.0
9	56.5	165.0	531.4	41.5	642.6	12.3	12.5	.0
10	41.3	120.6	.0	29.0	80.6	11.0	11.5	.0
11	28.8	83.9	32.4	20.5	89.7	6.2	6.3	.0
12	48.8	142.5	368.7	36.9	472.2	2.0	2.1	.1
13	41.3	120.5	3342.7	46.3	3408.3	9.0	9.2	.0
14	37.8	110.3	642.6	28.2	713.6	11.2	11.3	.0
15	37.4	109.2	80.6	26.4	157.5	5.9	-4.9	12.2
16	66.7	194.8	89.7	52.1	223.4	10.0	-4.7	17.5
17	51.8	151.1	472.2	37.7	543.7	42.0	42.2	.0
18	44.6	130.3	3408.3	50.1	3474.7	14.2	14.3	.0
19	28.0	81.8	713.6	21.3	769.1	5.0	1.7	.1
20	38.8	113.1	157.5	28.3	227.3	15.0	-9.0	26.6
21	59.6	174.1	223.4	48.3	288.0	62.7	9.1	54.8
22	16.9	49.4	.0	11.4	34.8	3.3	3.4	.0
23	40.3	117.7	.0	26.7	77.4	13.6	4.1	13.1
24	55.3	161.4	3474.7	60.8	3565.8	9.9	8.4	.0
25	39.3	114.7	769.1	30.0	843.5	10.3	10.6	.0
26	72.2	210.6	262.1	52.4	350.8	69.5	24.6	49.3
27	54.7	159.5	77.4	39.5	188.5	8.9	-49.0	62.4
TOTAL	2512.4	8089.8	18491.8	1953.5	24272.0	405.2	188.7	236.0

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1992
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	2380.6	.0	791.8	1631.2	.0	.0	.0
2	5.2	8.8	.0	2.8	5.9	.0	.0	.0
3	160.4	296.2	.0	89.9	206.1	.3	.0	.0
4	66.5	122.9	.0	37.3	85.6	.1	.0	.0
5	59.0	99.0	206.1	40.0	253.6	11.6	12.4	.0
6	20.1	33.8	.0	12.4	13.0	8.4	8.5	.0
7	111.1	186.5	85.6	71.1	166.2	34.9	35.8	.0
8	48.4	81.2	1631.2	51.6	1652.2	9.1	9.3	.0
9	56.5	94.9	259.5	36.7	307.8	10.0	10.2	.0
10	41.3	69.4	.0	25.4	36.8	7.2	8.0	.0
11	28.8	48.3	13.0	17.7	38.8	4.8	4.9	.0
12	48.8	82.0	166.2	32.3	214.3	1.6	1.8	.1
13	41.3	69.3	1652.2	44.1	1671.4	6.4	6.7	.0
14	37.8	63.5	307.8	25.0	337.9	8.3	8.6	.0
15	37.4	62.8	36.8	23.1	71.8	4.7	-3.5	13.0
16	66.7	112.1	38.8	44.7	99.1	7.7	-6.5	18.3
17	51.8	86.9	214.3	33.0	241.5	26.7	26.9	.0
18	44.6	75.0	1671.4	47.6	1688.7	10.4	10.6	.0
19	28.0	47.0	337.9	18.8	362.6	3.6	3.7	.1
20	38.8	65.1	71.8	24.3	100.8	11.7	-8.1	29.5
21	59.6	100.1	99.1	41.7	116.5	42.3	-18.2	61.6
22	16.9	28.4	.0	9.4	17.1	1.9	3.2	.0
23	40.3	67.7	.0	22.0	37.1	8.6	3.3	14.0
24	55.3	92.9	1688.7	57.2	1718.8	6.0	6.5	.0
25	39.3	66.0	362.6	26.4	394.6	7.6	8.1	.0
26	72.2	121.1	117.9	44.9	142.9	51.2	2.9	54.6
27	54.7	91.8	37.1	34.7	86.7	7.5	-59.5	70.9
TOTAL	2512.4	4653.2	8997.8	1705.9	11698.7	292.5	75.2	262.0

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1993
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3408.5	.0	985.3	2379.0	.0	.0	.0
2	5.2	12.6	.0	3.8	8.8	.0	.0	.0
3	160.4	424.1	.0	117.9	305.8	.3	.0	.0
4	66.5	175.9	.0	48.9	127.0	.1	.0	.0
5	59.0	141.8	305.8	49.3	384.1	14.2	13.9	.0
6	20.1	48.4	.0	15.6	21.5	11.3	11.1	.0
7	111.1	267.1	127.0	88.6	262.7	42.7	41.3	.0
8	48.4	116.3	2379.0	52.7	2430.9	11.2	11.0	.0
9	56.5	135.9	392.9	45.0	472.4	11.4	11.0	.0
10	41.3	99.3	.0	31.5	57.8	10.0	9.5	.0
11	28.8	69.1	21.5	22.1	62.6	5.9	5.8	.0
12	48.8	117.3	262.7	39.9	338.2	1.9	1.6	.1
13	41.3	99.3	2430.9	45.0	2477.2	7.6	7.4	.0
14	37.8	90.9	472.4	30.3	522.9	10.0	9.7	.0
15	37.4	89.9	57.8	28.7	113.2	5.8	-5.6	9.2
16	66.7	160.4	62.6	54.2	158.6	9.0	-8.7	13.1
17	51.8	124.4	338.2	40.8	385.7	36.1	35.8	.0
18	44.6	107.3	2477.2	48.7	2523.3	12.2	12.2	.0
19	28.0	67.4	522.9	22.9	563.0	4.4	3.2	.1
20	38.8	93.2	113.2	30.5	160.9	14.9	-9.3	21.7
21	59.6	143.4	158.6	49.7	196.2	54.1	6.4	46.1
22	16.9	40.7	.0	12.4	25.3	3.0	2.9	.0
23	40.3	96.9	.0	29.0	55.8	12.1	.6	8.5
24	55.3	132.9	2523.3	59.3	2588.8	7.8	7.4	.0
25	39.3	94.5	563.0	32.3	615.7	9.5	8.9	.0
26	72.2	173.5	186.2	56.4	236.5	66.7	18.3	40.2
27	54.7	131.4	55.8	42.9	135.5	8.8	-51.0	53.7
TOTAL	2512.4	6662.5	13451.2	2084.0	17609.6	371.1	143.5	192.7

(5) Under Draft with Irrigation Water Demand <Water Demand x 1.75>

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1980
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3689.2	.0	993.6	2700.1	.0	.0	.0
2	5.2	13.6	.0	3.7	9.9	.0	.0	.0
3	160.4	459.1	.0	116.7	342.0	.3	.0	.0
4	66.5	190.4	.0	48.4	142.0	.1	.0	.0
5	59.0	153.5	342.0	50.0	430.8	14.8	14.9	.0
6	20.1	52.4	.0	15.6	26.2	10.6	10.7	.0
7	111.1	289.1	142.0	89.9	297.7	43.4	43.2	.0
8	48.4	125.8	2700.1	53.9	2760.0	12.1	12.1	.0
9	56.5	147.0	440.7	46.2	528.9	12.6	12.5	.0
10	41.3	107.5	.0	32.1	65.3	10.1	10.0	.0
11	28.8	74.8	26.2	22.3	72.7	6.0	6.0	.0
12	48.8	127.0	297.7	40.7	381.9	2.1	2.0	.1
13	41.3	107.5	2760.0	46.0	2813.4	8.1	8.1	.0
14	37.8	98.4	528.9	31.3	585.0	11.0	10.9	.0
15	37.4	97.3	65.3	29.3	127.4	5.9	-7.1	11.2
16	66.7	173.7	72.7	55.4	182.2	9.2	-9.6	15.9
17	51.8	134.7	381.9	41.1	439.4	36.2	36.1	.0
18	44.6	116.2	2813.4	49.7	2866.9	13.0	13.0	.0
19	28.0	72.9	585.0	23.5	629.5	4.8	1.7	.1
20	38.8	100.8	127.4	30.7	183.1	14.4	-9.9	22.7
21	59.6	155.2	182.2	51.0	232.6	54.5	.2	54.0
22	16.9	44.1	.0	12.2	28.8	3.0	3.0	.0
23	40.3	104.9	.0	28.8	63.5	12.6	.9	10.0
24	55.3	143.9	2866.9	60.8	2941.3	8.7	6.8	.0
25	39.3	102.3	629.6	32.9	689.1	9.8	9.7	.0
26	72.2	187.7	211.9	56.0	280.6	63.0	15.3	47.4
27	54.7	142.2	63.5	43.7	152.9	9.1	-55.0	62.8
TOTAL	2512.4	7211.2	15237.3	2105.5	19973.1	375.5	135.3	224.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1981
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3615.5	.0	931.8	2743.9	.0	.0	.0
2	5.2	13.3	.0	3.0	10.3	.0	.0	.0
3	160.4	449.9	.0	97.3	352.6	.3	.0	.0
4	66.5	186.6	.0	40.3	146.2	.1	.0	.0
5	59.0	150.4	352.6	47.0	443.7	12.3	14.2	.0
6	20.1	51.4	.0	14.0	29.5	7.9	8.2	.0
7	111.1	283.3	146.2	82.4	314.5	32.6	35.9	.0
8	48.4	123.3	2743.9	52.8	2803.0	12.2	12.1	.0
9	56.5	144.1	454.0	41.4	546.8	9.9	10.7	.0
10	41.3	105.4	.0	27.6	69.9	7.9	8.7	.0
11	28.8	73.3	29.5	19.5	78.6	4.7	4.9	.0
12	48.8	124.5	314.5	37.7	399.6	1.7	2.2	.1
13	41.3	105.3	2803.0	45.1	2855.5	8.2	8.4	.0
14	37.8	96.4	546.8	28.6	605.4	9.3	10.1	.0
15	37.4	95.4	69.9	25.4	135.5	4.4	-5.8	16.6
16	66.7	170.2	78.6	52.4	189.5	7.8	-6.2	23.5
17	51.8	132.0	399.6	36.6	466.0	29.1	29.7	.0
18	44.6	113.9	2855.5	48.8	2908.0	13.1	13.2	.0
19	28.0	71.4	605.4	21.7	650.9	4.2	1.0	.1
20	38.8	98.8	135.5	28.0	194.9	11.4	-9.7	30.0
21	59.6	152.1	189.5	49.7	250.1	43.7	-25.2	74.7
22	16.9	43.2	.0	10.2	30.6	2.4	2.9	.0
23	40.3	102.8	.0	23.7	67.8	11.3	2.6	15.1
24	55.3	141.0	2908.0	60.4	2980.2	9.0	4.8	.0
25	39.3	100.2	651.0	30.5	712.1	8.6	11.0	.0
26	72.2	184.0	225.5	50.8	310.5	48.2	-1.9	68.8
27	54.7	139.4	67.8	39.1	161.3	6.8	-67.9	86.8
TOTAL	2512.4	7067.1	15577.0	1945.9	20457.1	306.7	63.8	315.6

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1982
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	4057.9	.0	883.5	3152.8	.0	.0	.0
2	5.2	15.0	.0	2.9	12.0	.0	.0	.0
3	160.4	504.9	.0	92.8	411.6	.3	.0	.0
4	66.5	209.5	.0	38.5	170.9	.1	.0	.0
5	59.0	168.8	411.6	44.2	523.2	13.1	12.8	.0
6	20.1	57.6	.0	13.4	35.5	8.8	8.7	.0
7	111.1	318.0	170.9	77.6	376.7	34.7	33.8	.0
8	48.4	138.4	3152.8	52.0	3225.7	13.3	12.3	.0
9	56.5	161.7	535.2	39.8	646.3	10.8	10.5	.0
10	41.3	118.3	.0	26.1	83.9	8.3	8.5	.0
11	28.8	82.3	35.5	18.9	93.8	5.0	5.0	.0
12	48.8	139.7	376.7	35.8	478.7	1.9	1.7	.1
13	41.3	118.2	3225.7	44.4	3290.6	8.8	8.3	.0
14	37.8	108.2	646.3	27.1	717.1	10.2	10.2	.0
15	37.4	107.1	83.9	24.0	162.5	4.4	-7.4	18.1
16	66.7	191.0	93.8	48.7	227.4	8.7	-8.6	25.6
17	51.8	148.2	478.7	35.7	557.3	33.8	33.6	.0
18	44.6	127.8	3290.6	48.0	3356.3	13.9	13.6	.0
19	28.0	80.2	717.1	20.6	772.0	4.8	2.5	.1
20	38.8	110.9	162.5	26.8	234.2	12.5	-8.2	20.4
21	59.6	170.7	227.4	45.1	297.2	55.1	-27.4	79.1
22	16.9	48.5	.0	9.8	36.2	2.5	2.5	.0
23	40.3	115.4	.0	22.2	80.9	12.3	2.4	10.9
24	55.3	158.3	3356.3	58.3	3446.7	9.4	5.4	.0
25	39.3	112.5	772.0	29.0	845.5	9.9	9.1	.0
26	72.2	206.5	270.4	49.4	371.8	55.7	-19.8	74.9
27	54.7	156.4	80.9	36.9	193.3	7.0	-83.3	90.7
TOTAL	2512.4	7931.8	16088.4	1851.4	23800.2	345.1	26.3	319.8

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1983
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3551.7	.0	937.3	2593.1	.0	.0	.0
2	5.2	13.1	.0	3.4	9.6	.0	.0	.0
3	160.4	441.9	.0	106.3	334.2	.3	.0	.0
4	66.5	183.3	.0	44.1	138.7	.1	.0	.0
5	59.0	147.8	334.2	46.2	422.2	13.1	13.3	.0
6	20.1	50.5	.0	14.7	24.6	11.0	11.0	.0
7	111.1	278.3	138.7	83.3	291.6	41.5	41.1	.0
8	48.4	121.2	2593.1	53.2	2649.0	11.7	11.7	.0
9	56.5	141.6	431.9	42.6	519.4	11.2	11.1	.0
10	41.3	103.5	.0	29.2	64.6	9.5	9.2	.0
11	28.8	72.0	24.6	20.8	70.0	5.7	5.6	.0
12	48.8	122.3	291.6	37.8	374.0	1.8	1.7	.1
13	41.3	103.4	2649.0	45.5	2698.9	7.9	7.8	.0
14	37.8	94.7	519.4	29.0	574.9	10.0	10.0	.0
15	37.4	93.7	64.6	26.8	125.9	5.4	-9.2	15.4
16	66.7	167.2	70.0	53.0	174.7	9.2	-12.7	21.8
17	51.8	129.7	374.0	38.7	427.0	37.7	37.6	.0
18	44.6	111.8	2698.9	49.2	2748.7	12.6	12.6	.0
19	28.0	70.2	574.9	21.8	618.7	4.5	3.4	.1
20	38.8	97.1	125.9	29.0	179.3	14.5	-8.3	21.5
21	59.6	149.4	174.7	49.2	216.9	57.4	-11.7	68.7
22	16.9	42.4	.0	11.3	28.3	2.8	2.6	.0
23	40.3	101.0	.0	26.0	62.8	12.1	.8	9.8
24	55.3	138.5	2748.7	59.7	2818.7	8.4	8.0	.0
25	39.3	98.4	618.7	30.7	676.9	9.4	8.8	.0
26	72.2	180.7	207.5	53.7	268.2	66.1	-5.8	63.6
27	54.7	136.9	62.8	39.8	151.2	8.4	-75.8	79.4
TOTAL	2512.4	6942.4	14703.3	1982.1	19262.2	372.2	73.1	280.3

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1984
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	5070.2	.0	981.6	4074.8	.0	.0	.0
2	5.2	18.7	.0	3.6	15.1	.0	.0	.0
3	160.4	630.9	.0	113.6	517.9	.3	.0	.0
4	66.5	261.7	.0	47.1	215.0	.1	.0	.0
5	59.0	210.9	517.9	49.9	662.6	16.7	15.1	.0
6	20.1	72.0	.0	15.4	45.0	11.8	11.7	.0
7	111.1	397.3	215.0	88.2	479.7	45.0	44.3	.0
8	48.4	173.0	4074.8	53.2	4178.6	15.8	13.6	.0
9	56.5	202.1	677.8	44.9	821.6	13.7	13.4	.0
10	41.3	147.8	.0	31.3	105.5	11.2	10.9	.0
11	28.8	102.8	45.0	21.9	119.3	6.7	6.7	.0
12	48.8	174.6	479.7	39.8	612.5	2.2	2.0	.1
13	41.3	147.7	4178.6	45.4	4270.5	10.3	9.0	.0
14	37.8	135.2	821.6	30.2	914.2	12.5	10.7	.0
15	37.4	133.8	105.5	28.6	204.6	6.2	-10.8	14.6
16	66.7	238.7	119.3	54.9	293.1	9.8	-14.4	20.5
17	51.8	185.1	612.5	40.4	714.5	43.0	40.3	.0
18	44.6	159.7	4270.5	49.1	4365.1	15.9	14.4	.0
19	28.0	100.2	914.3	22.8	986.1	5.7	1.5	.1
20	38.8	138.6	204.6	30.0	298.1	15.4	-8.7	23.2
21	59.6	213.3	293.1	50.8	388.4	66.8	-1.9	68.3
22	16.9	60.6	.0	11.9	45.5	3.2	2.8	.0
23	40.3	144.2	.0	27.6	100.9	15.8	1.3	11.2
24	55.3	197.8	4365.2	59.6	4491.8	11.6	5.9	.0
25	39.3	140.5	986.2	32.0	1083.6	11.3	10.8	.0
26	72.2	258.0	343.6	55.1	476.8	70.0	5.5	61.5
27	54.7	195.4	100.9	42.5	244.7	9.4	-71.3	78.8
TOTAL	2512.4	9910.6	23326.1	2071.4	30725.7	430.5	112.9	278.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1985
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	4151.5	.0	1009.0	3069.8	.0	.0	.0
2	5.2	15.3	.0	3.9	11.3	.0	.0	.0
3	160.4	516.6	.0	121.6	391.4	.3	.0	.0
4	66.5	214.3	.0	50.4	162.5	.1	.0	.0
5	59.0	172.7	391.4	51.6	493.3	15.9	15.6	.0
6	20.1	59.0	.0	16.3	29.7	12.5	12.3	.0
7	111.1	325.3	162.5	92.2	344.4	47.6	46.2	.0
8	48.4	141.6	3069.8	53.8	3143.9	13.1	12.9	.0
9	56.5	165.5	504.7	47.2	608.2	13.1	12.7	.0
10	41.3	121.0	.0	32.8	76.0	11.1	10.8	.0
11	28.8	84.2	29.7	23.2	83.3	6.7	6.5	.0
12	48.8	142.9	344.4	41.8	442.0	2.2	1.9	.1
13	41.3	120.9	3143.9	45.9	3209.7	8.7	8.6	.0
14	37.8	110.7	608.2	31.7	674.5	11.6	11.2	.0
15	37.4	109.5	76.0	30.0	148.0	6.5	-10.0	12.1
16	66.7	195.4	83.3	56.3	209.0	9.9	-14.1	16.8
17	51.8	151.6	442.0	42.6	508.2	41.4	40.8	.0
18	44.6	130.7	3209.7	49.7	3276.2	13.8	13.7	.0
19	28.0	82.0	674.5	23.8	726.8	5.2	2.2	.1
20	38.8	113.5	148.0	31.8	212.3	16.4	-9.3	21.8
21	59.6	174.6	209.0	52.0	265.4	62.8	-.9	62.5
22	16.9	49.6	.0	12.7	33.4	3.2	3.0	.0
23	40.3	118.0	.0	29.9	73.4	14.0	1.3	10.8
24	55.3	161.9	3276.2	60.8	3366.9	9.5	7.2	.0
25	39.3	115.1	726.8	33.4	796.3	10.9	10.2	.0
26	72.2	211.3	245.6	58.8	320.2	75.9	13.2	54.4
27	54.7	160.0	73.4	44.7	177.4	9.7	-67.1	72.8
TOTAL	2512.4	8114.7	17419.2	2148.0	22853.7	422.0	128.8	251.3

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1986
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	2485.5	.0	909.3	1681.4	.0	.0	.0
2	5.2	9.2	.0	3.2	6.0	.0	.0	.0
3	160.4	309.3	.0	101.6	210.8	.3	.0	.0
4	66.5	128.3	.0	42.1	87.5	.1	.0	.0
5	59.0	103.4	210.8	45.7	258.3	13.4	14.8	.0
6	20.1	35.3	.0	14.1	13.4	8.4	8.6	.0
7	111.1	194.8	87.5	80.9	165.6	39.3	41.4	.0
8	48.4	84.8	1681.4	52.2	1705.9	9.2	9.4	.0
9	56.5	99.1	264.4	41.4	312.8	10.9	11.4	.0
10	41.3	72.4	.0	28.7	37.2	7.5	8.1	.0
11	28.8	50.4	13.4	20.0	39.3	5.3	5.5	.0
12	48.8	85.6	165.6	36.9	213.9	1.8	2.1	.1
13	41.3	72.4	1705.9	44.5	1728.1	6.5	6.7	.0
14	37.8	66.3	312.8	28.0	343.1	9.0	9.5	.0
15	37.4	65.6	37.2	26.4	72.2	5.3	-6.9	14.7
16	66.7	117.0	39.3	51.4	99.4	9.4	-8.3	20.6
17	51.8	90.7	213.9	37.4	241.0	27.6	28.1	.0
18	44.6	78.3	1728.1	48.1	1748.5	10.7	10.9	.0
19	28.0	49.1	343.1	21.1	368.0	3.9	3.4	.1
20	38.8	67.9	72.2	27.6	100.4	13.1	-9.2	27.1
21	59.6	104.6	99.4	47.3	117.6	43.7	-26.8	72.0
22	16.9	29.7	.0	10.6	17.5	2.0	2.8	.0
23	40.3	70.7	.0	24.9	37.8	8.7	2.0	12.4
24	55.3	96.9	1748.5	59.3	1780.9	6.5	6.9	.0
25	39.3	68.9	368.0	29.7	399.9	8.6	9.5	.0
26	72.2	126.5	117.8	50.7	144.2	51.4	-2.4	63.4
27	54.7	95.8	37.8	39.0	87.9	8.3	-69.8	83.3
TOTAL	2512.4	4858.3	9247.1	1921.9	12018.5	310.9	57.8	293.6

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1987
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	2736.5	.0	933.4	1805.0	.0	.0	.0
2	5.2	10.1	.0	3.5	6.6	.0	.0	.0
3	160.4	340.5	.0	111.3	228.9	.3	.0	.0
4	66.5	141.3	.0	46.1	95.1	.1	.0	.0
5	59.0	113.8	228.9	46.7	284.0	12.0	12.0	.0
6	20.1	38.9	.0	14.5	15.9	8.5	8.4	.0
7	111.1	214.4	95.1	82.8	189.9	36.8	36.3	.0
8	48.4	93.3	1805.0	52.3	1836.5	9.6	9.6	.0
9	56.5	109.1	290.5	42.5	347.0	10.1	9.9	.0
10	41.3	79.7	.0	29.8	41.9	8.0	8.0	.0
11	28.8	55.5	15.9	20.7	45.7	5.1	5.1	.0
12	48.8	94.2	189.9	37.4	245.1	1.7	1.5	.1
13	41.3	79.7	1836.5	44.7	1865.0	6.6	6.6	.0
14	37.8	73.0	347.0	28.8	382.6	8.6	8.5	.0
15	37.4	72.2	41.9	27.2	81.8	5.1	-7.1	12.7
16	66.7	128.8	45.7	50.8	116.1	7.6	-8.3	17.9
17	51.8	99.9	245.1	38.3	279.0	27.7	27.6	.0
18	44.6	86.2	1865.0	48.3	1892.1	10.8	10.8	.0
19	28.0	54.1	382.6	21.7	411.3	3.8	3.4	.1
20	38.8	74.8	81.8	28.2	116.3	12.1	-8.6	20.3
21	59.6	115.1	116.1	46.7	141.7	42.6	-21.6	63.7
22	16.9	32.7	.0	11.5	18.9	2.3	2.4	.0
23	40.3	77.8	.0	27.1	41.1	9.7	.8	8.2
24	55.3	106.7	1892.1	58.3	1934.0	6.5	6.6	.0
25	39.3	75.8	411.3	30.5	448.4	8.2	8.0	.0
26	72.2	139.3	135.1	51.8	172.9	49.6	-6.5	55.3
27	54.7	105.5	41.1	40.5	98.1	7.9	-68.4	74.7
TOTAL	2512.4	5348.8	10066.5	1975.2	13140.7	301.3	45.1	252.9

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1988
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3397.2	.0	1092.8	2286.4	.0	.0	.0
2	5.2	12.5	.0	3.8	8.7	.0	.0	.0
3	160.4	422.7	.0	118.5	303.9	.3	.0	.0
4	66.5	175.4	.0	49.1	126.2	.1	.0	.0
5	59.0	141.3	303.9	56.5	372.0	16.8	16.6	.0
6	20.1	48.3	.0	17.1	20.2	11.0	11.0	.0
7	111.1	266.2	126.2	99.5	244.0	48.8	49.6	.0
8	48.4	115.9	2286.4	52.3	2338.9	10.9	10.9	.0
9	56.5	135.4	380.7	51.6	451.0	13.5	13.5	.0
10	41.3	99.0	.0	34.6	54.2	10.2	10.0	.0
11	28.8	68.9	20.2	24.3	57.9	6.9	6.9	.0
12	48.8	117.0	244.0	45.2	313.5	2.3	2.3	.1
13	41.3	98.9	2338.9	44.6	2385.6	7.5	7.4	.0
14	37.8	90.6	451.0	35.1	495.0	11.5	11.4	.0
15	37.4	89.6	54.2	31.9	105.1	6.7	-8.6	11.8
16	66.7	159.9	57.9	60.9	146.0	10.7	-12.2	16.6
17	51.8	124.0	313.5	45.0	356.7	35.8	35.9	.0
18	44.6	107.0	2385.6	48.2	2432.0	12.2	12.1	.0
19	28.0	67.1	495.0	26.4	530.7	5.1	2.8	.1
20	38.8	92.8	105.1	33.5	147.8	16.6	-9.2	24.2
21	59.6	142.9	146.0	55.9	179.3	53.6	-3.3	57.0
22	16.9	40.6	.0	12.6	25.3	2.7	2.6	.0
23	40.3	96.6	.0	29.1	55.1	12.4	.3	10.5
24	55.3	132.5	2432.0	59.6	2496.7	8.1	7.0	.0
25	39.3	94.2	530.7	36.9	577.0	11.0	11.2	.0
26	72.2	172.9	173.2	61.5	219.4	65.1	15.4	50.3
27	54.7	130.9	55.1	48.1	127.7	10.3	-56.1	65.7
TOTAL	2512.4	6640.3	12899.6	2274.6	16856.3	389.9	137.4	236.3

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1989
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3673.7	.0	942.5	2735.0	.0	.0	.0
2	5.2	13.5	.0	3.5	10.0	.0	.0	.0
3	160.4	457.1	.0	109.4	347.5	.3	.0	.0
4	66.5	189.6	.0	45.4	144.2	.1	.0	.0
5	59.0	152.8	347.5	47.9	438.3	14.2	15.2	.0
6	20.1	52.2	.0	14.8	25.7	11.7	11.7	.0
7	111.1	287.9	144.2	85.1	304.7	42.3	42.5	.0
8	48.4	125.3	2735.0	54.6	2793.7	12.1	12.1	.0
9	56.5	146.4	448.3	44.2	538.4	12.1	12.3	.0
10	41.3	107.1	.0	30.0	66.9	10.2	10.2	.0
11	28.8	74.5	25.7	21.1	73.2	6.0	6.0	.0
12	48.8	126.5	304.7	38.9	390.3	2.0	1.9	.1
13	41.3	107.0	2793.7	46.6	2846.0	8.1	8.1	.0
14	37.8	97.9	538.4	30.3	595.2	10.8	10.9	.0
15	37.4	96.9	66.9	27.4	130.6	5.8	-8.5	13.7
16	66.7	172.9	73.2	53.4	183.8	9.2	-11.3	19.6
17	51.8	134.1	390.3	38.8	446.3	39.4	39.4	.0
18	44.6	115.7	2846.0	50.3	2898.8	12.6	12.6	.0
19	28.0	72.6	595.2	22.7	640.4	4.7	3.3	.1
20	38.8	100.4	130.6	29.1	187.2	14.7	-9.2	23.7
21	59.6	154.5	183.8	49.4	231.7	57.6	-5.6	63.3
22	16.9	43.9	.0	11.5	29.2	3.1	2.8	.0
23	40.3	104.4	.0	27.1	64.8	12.6	1.5	10.4
24	55.3	143.3	2898.8	59.7	2973.8	8.6	8.5	.0
25	39.3	101.8	640.4	31.1	701.6	9.6	9.6	.0
26	72.2	186.9	216.5	53.4	281.7	68.3	11.9	56.2
27	54.7	141.6	64.8	41.3	156.3	8.8	-63.8	72.9
TOTAL	2512.4	7180.7	15444.1	2009.4	20235.4	384.9	121.9	259.9

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1990
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	6181.8	.0	1147.2	4963.0	.0	.0	.0
2	5.2	22.8	.0	4.5	18.3	.0	.0	.0
3	160.4	769.2	.0	138.1	630.6	.3	.0	.0
4	66.5	319.1	.0	57.3	261.7	.1	.0	.0
5	59.0	257.2	630.6	58.3	809.7	19.7	17.0	.0
6	20.1	87.8	.0	18.5	53.1	16.2	16.0	.0
7	111.1	484.4	261.7	105.4	585.8	54.9	53.1	.0
8	48.4	210.9	4963.0	55.9	5098.9	18.3	17.1	.0
9	56.5	246.4	828.1	54.2	1003.9	16.5	16.0	.0
10	41.3	180.2	.0	37.4	127.3	15.5	14.5	.0
11	28.8	125.4	53.1	26.3	144.1	8.1	7.9	.0
12	48.8	212.8	585.8	47.3	748.7	2.6	2.2	.1
13	41.3	180.1	5098.9	47.7	5219.0	11.7	10.7	.0
14	37.8	164.8	1003.9	36.1	1117.5	15.0	13.7	.0
15	37.4	163.1	127.3	34.1	248.6	7.7	-11.6	9.5
16	66.7	291.0	144.1	64.0	357.8	11.6	-9.0	13.4
17	51.8	225.7	748.7	48.2	869.4	56.8	55.4	.0
18	44.6	194.7	5219.0	51.6	5343.4	18.0	17.5	.0
19	28.0	122.2	1117.5	27.0	1205.8	6.8	-2.6	.1
20	38.8	168.9	248.6	36.1	362.1	19.3	-10.1	19.4
21	59.6	260.1	357.8	58.8	474.5	81.8	32.7	47.1
22	16.9	73.8	.0	14.6	54.3	4.9	3.3	.0
23	40.3	175.8	.0	34.4	121.3	20.1	.9	8.6
24	55.3	241.1	5343.4	63.9	5506.1	13.9	3.4	.0
25	39.3	171.3	1206.0	38.0	1325.6	13.8	12.9	.0
26	72.2	314.6	416.4	67.0	571.6	92.4	41.1	41.2
27	54.7	238.3	121.3	51.2	296.9	11.5	-49.9	54.9
TOTAL	2512.4	12083.4	28475.2	2423.2	37518.8	537.6	252.2	194.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1991
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	4138.7	.0	914.9	3268.9	.0	.0	.0
2	5.2	15.3	.0	3.4	11.8	.0	.0	.0
3	160.4	515.0	.0	107.4	407.4	.3	.0	.0
4	66.5	213.6	.0	44.5	169.0	.1	.0	.0
5	59.0	172.2	407.4	45.5	519.6	14.5	15.2	.0
6	20.1	58.8	.0	14.4	32.4	11.9	12.0	.0
7	111.1	324.3	169.0	81.7	368.7	43.0	44.1	.0
8	48.4	141.2	3268.9	54.2	3342.7	13.6	13.7	.0
9	56.5	165.0	531.4	41.5	642.6	12.3	12.5	.0
10	41.3	120.6	.0	29.0	80.6	11.0	11.4	.0
11	28.8	83.9	32.4	20.5	89.7	6.2	6.3	.0
12	48.8	142.5	368.7	36.9	472.2	2.0	2.1	.1
13	41.3	120.5	3342.7	46.3	3408.3	9.0	9.2	.0
14	37.8	110.3	642.6	28.2	713.6	11.2	11.3	.0
15	37.4	109.2	80.6	26.4	157.5	5.9	-7.1	14.3
16	66.7	194.8	89.7	52.1	223.4	10.0	-7.6	20.5
17	51.8	151.1	472.2	37.7	543.7	42.0	42.2	.0
18	44.6	130.3	3408.3	50.1	3474.7	14.2	14.3	.0
19	28.0	81.8	713.6	21.3	769.0	5.0	2.0	.1
20	38.8	113.1	157.5	28.3	227.3	15.0	-10.6	31.0
21	59.6	174.1	223.4	48.3	288.0	62.7	-.7	64.8
22	16.9	49.4	.0	11.4	34.8	3.3	3.7	.0
23	40.3	117.7	.0	26.7	77.4	13.6	3.7	15.4
24	55.3	161.4	3474.7	60.8	3565.8	9.9	8.5	.0
25	39.3	114.7	769.1	30.0	843.5	10.3	10.7	.0
26	72.2	210.6	262.1	52.4	350.8	69.5	16.7	58.2
27	54.7	159.5	77.4	39.5	188.5	8.9	-60.1	74.0
TOTAL	2512.4	8089.8	18491.7	1953.5	24272.0	405.3	153.5	278.6

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1992
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	2380.6	.0	791.8	1631.2	.0	.0	.0
2	5.2	8.8	.0	2.8	5.9	.0	.0	.0
3	160.4	296.2	.0	89.9	206.1	.3	.0	.0
4	66.5	122.9	.0	37.3	85.6	.1	.0	.0
5	59.0	99.0	206.1	40.0	253.6	11.6	12.4	.0
6	20.1	33.8	.0	12.4	13.0	8.4	8.5	.0
7	111.1	186.5	85.6	71.1	166.2	34.9	35.8	.0
8	48.4	81.2	1631.2	51.6	1652.2	9.1	9.3	.0
9	56.5	94.9	259.5	36.7	307.8	10.0	10.2	.0
10	41.3	69.4	.0	25.4	36.8	7.2	8.0	.0
11	28.8	48.3	13.0	17.7	38.8	4.8	4.9	.0
12	48.8	82.0	166.2	32.3	214.3	1.6	1.8	.1
13	41.3	69.3	1652.2	44.1	1671.4	6.4	6.7	.0
14	37.8	63.5	307.8	25.0	337.9	8.3	8.7	.0
15	37.4	62.8	36.8	23.1	71.8	4.7	-4.4	15.4
16	66.7	112.1	38.8	44.7	99.1	7.7	-6.9	21.7
17	51.8	86.9	214.3	33.0	241.5	26.7	26.9	.0
18	44.6	75.0	1671.4	47.6	1688.7	10.4	10.6	.0
19	28.0	47.0	337.9	18.8	362.6	3.6	3.7	.1
20	38.8	65.1	71.8	24.3	100.8	11.7	-10.1	28.7
21	59.6	100.1	99.1	41.7	116.5	42.3	-29.9	73.5
22	16.9	28.4	.0	9.4	17.1	1.9	3.0	.0
23	40.3	67.7	.0	22.0	37.1	8.6	2.9	13.7
24	55.3	92.9	1688.7	57.2	1718.8	6.0	6.5	.0
25	39.3	66.0	362.6	26.4	394.6	7.6	8.2	.0
26	72.2	121.1	117.9	44.9	142.9	51.2	-6.3	65.2
27	54.7	91.8	37.1	34.7	86.7	7.5	-72.4	84.8
TOTAL	2512.4	4653.2	8997.8	1705.9	11698.7	292.5	37.8	303.1

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1993
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3408.5	.0	985.3	2379.0	.0	.0	.0
2	5.2	12.6	.0	3.8	8.8	.0	.0	.0
3	160.4	424.1	.0	117.9	305.8	.3	.0	.0
4	66.5	175.9	.0	48.9	127.0	.1	.0	.0
5	59.0	141.8	305.8	49.3	384.1	14.2	13.9	.0
6	20.1	48.4	.0	15.6	21.5	11.3	11.1	.0
7	111.1	267.1	127.0	88.6	262.7	42.7	41.3	.0
8	48.4	116.3	2379.0	52.7	2430.9	11.2	11.0	.0
9	56.5	135.9	392.9	45.0	472.4	11.4	11.0	.0
10	41.3	99.3	.0	31.5	57.8	10.0	9.5	.0
11	28.8	69.1	21.5	22.1	62.6	5.9	5.8	.0
12	48.8	117.3	262.7	39.9	338.2	1.9	1.6	.1
13	41.3	99.3	2430.9	45.0	2477.2	7.6	7.4	.0
14	37.8	90.9	472.4	30.3	522.9	10.0	9.7	.0
15	37.4	89.9	57.8	28.7	113.2	5.8	-7.0	11.0
16	66.7	160.4	62.6	54.2	158.6	9.0	-11.2	15.6
17	51.8	124.4	338.2	40.8	385.7	36.1	35.8	.0
18	44.6	107.3	2477.2	48.7	2523.3	12.2	12.2	.0
19	28.0	67.4	522.9	22.9	563.0	4.4	3.4	.1
20	38.8	93.2	113.2	30.5	160.9	14.9	-9.6	18.7
21	59.6	143.4	158.6	49.7	196.2	54.1	-3.4	55.7
22	16.9	40.7	.0	12.4	25.3	3.0	2.7	.0
23	40.3	96.9	.0	29.0	55.8	12.1	.5	7.3
24	55.3	132.9	2523.3	59.3	2588.8	7.8	7.5	.0
25	39.3	94.5	563.0	32.3	615.7	9.5	8.8	.0
26	72.2	173.5	186.2	56.4	236.5	66.7	8.1	48.3
27	54.7	131.4	55.8	42.9	135.5	8.8	-63.4	65.1
TOTAL	2512.4	6662.5	13451.2	2084.0	17609.6	371.1	106.9	221.8

(6) Under Draft with Irrigation Water Demand <Water Demand x 2.00>

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1980
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3689.2	.0	993.6	2700.1	.0	.0	.0
2	5.2	13.6	.0	3.7	9.9	.0	.0	.0
3	160.4	459.1	.0	116.7	342.0	.3	.0	.0
4	66.5	190.4	.0	48.4	142.0	.1	.0	.0
5	59.0	153.5	342.0	50.0	430.8	14.8	14.9	.0
6	20.1	52.4	.0	15.6	26.2	10.6	10.7	.0
7	111.1	289.1	142.0	89.9	297.7	43.4	43.2	.0
8	48.4	125.8	2700.1	53.9	2760.0	12.1	12.1	.0
9	56.5	147.0	440.7	46.2	528.9	12.6	12.5	.0
10	41.3	107.5	.0	32.1	65.3	10.1	10.0	.0
11	28.8	74.8	26.2	22.3	72.7	6.0	6.0	.0
12	48.8	127.0	297.7	40.7	381.9	2.1	2.0	.1
13	41.3	107.5	2760.0	46.0	2813.4	8.1	8.1	.0
14	37.8	98.4	528.9	31.3	585.0	11.0	10.9	.0
15	37.4	97.3	65.3	29.3	127.4	5.9	-9.1	13.1
16	66.7	173.7	72.7	55.4	182.2	9.2	-11.8	18.5
17	51.8	134.7	381.9	41.1	439.4	36.2	36.1	.0
18	44.6	116.2	2813.4	49.7	2866.9	13.0	13.0	.0
19	28.0	72.9	585.0	23.5	629.5	4.8	2.0	.1
20	38.8	100.8	127.4	30.7	183.1	14.4	-9.1	22.8
21	59.6	155.2	182.2	51.0	232.6	54.5	-9.1	63.2
22	16.9	44.1	.0	12.2	28.8	3.0	3.0	.0
23	40.3	104.9	.0	28.8	63.5	12.6	1.2	9.9
24	55.3	143.9	2866.9	60.8	2941.3	8.7	6.9	.0
25	39.3	102.3	629.6	32.9	689.1	9.8	9.7	.0
26	72.2	187.7	211.9	56.0	280.6	63.0	7.4	55.4
27	54.7	142.2	63.5	43.7	152.9	9.1	-66.8	74.4
TOTAL	2512.4	7211.2	15237.3	2105.5	19973.1	375.5	103.5	257.4

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1981
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3615.5	.0	931.8	2743.9	.0	.0	.0
2	5.2	13.3	.0	3.0	10.3	.0	.0	.0
3	160.4	449.9	.0	97.3	352.6	.3	.0	.0
4	66.5	186.6	.0	40.3	146.2	.1	.0	.0
5	59.0	150.4	352.6	47.0	443.7	12.3	14.2	.0
6	20.1	51.4	.0	14.0	29.5	7.9	8.2	.0
7	111.1	283.3	146.2	82.4	314.5	32.6	35.9	.0
8	48.4	123.3	2743.9	52.8	2803.0	12.2	12.1	.0
9	56.5	144.1	454.0	41.4	546.8	9.9	10.7	.0
10	41.3	105.4	.0	27.6	69.9	7.9	8.7	.0
11	28.8	73.3	29.5	19.5	78.6	4.7	4.9	.0
12	48.8	124.5	314.5	37.7	399.6	1.7	2.2	.1
13	41.3	105.3	2803.0	45.1	2855.5	8.2	8.4	.0
14	37.8	96.4	546.8	28.6	605.4	9.3	10.1	.0
15	37.4	95.4	69.9	25.4	135.5	4.4	-7.8	19.2
16	66.7	170.2	78.6	52.4	189.5	7.8	-8.0	27.2
17	51.8	132.0	399.6	36.6	466.0	29.1	29.7	.0
18	44.6	113.9	2855.5	48.8	2908.0	13.1	13.2	.0
19	28.0	71.4	605.4	21.7	650.9	4.2	1.3	.1
20	38.8	98.8	135.5	28.0	194.9	11.4	-8.8	25.9
21	59.6	152.1	189.5	49.7	250.1	43.7	-32.3	82.3
22	16.9	43.2	.0	10.2	30.6	2.4	2.8	.0
23	40.3	102.8	.0	23.7	67.8	11.3	2.8	13.9
24	55.3	141.0	2908.0	60.4	2980.2	9.0	5.0	.0
25	39.3	100.2	651.0	30.5	712.1	8.6	11.4	.0
26	72.2	184.0	225.5	50.8	310.5	48.2	-10.8	79.7
27	54.7	139.4	67.8	39.1	161.3	6.8	-78.1	96.4
TOTAL	2512.4	7067.1	15577.0	1945.9	20457.1	306.7	35.8	344.7

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1982
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	4057.9	.0	883.5	3152.8	.0	.0	.0
2	5.2	15.0	.0	2.9	12.0	.0	.0	.0
3	160.4	504.9	.0	92.8	411.6	.3	.0	.0
4	66.5	209.5	.0	38.5	170.9	.1	.0	.0
5	59.0	168.8	411.6	44.2	523.2	13.1	12.8	.0
6	20.1	57.6	.0	13.4	35.5	8.8	8.7	.0
7	111.1	318.0	170.9	77.6	376.7	34.7	33.8	.0
8	48.4	138.4	3152.8	52.0	3225.7	13.3	12.3	.0
9	56.5	161.7	535.2	39.8	646.3	10.8	10.5	.0
10	41.3	118.3	.0	26.1	83.9	8.3	8.4	.0
11	28.8	82.3	35.5	18.9	93.8	5.0	5.0	.0
12	48.8	139.7	376.7	35.8	478.7	1.9	1.7	.1
13	41.3	118.2	3225.7	44.4	3290.6	8.8	8.3	.0
14	37.8	108.2	646.3	27.1	717.1	10.2	10.3	.0
15	37.4	107.1	83.9	24.0	162.5	4.4	-9.2	19.8
16	66.7	191.0	93.8	48.7	227.4	8.7	-10.6	29.6
17	51.8	148.2	478.7	35.7	557.3	33.8	33.6	.0
18	44.6	127.8	3290.6	48.0	3356.3	13.9	13.6	.0
19	28.0	80.2	717.1	20.6	772.0	4.8	2.9	.1
20	38.8	110.9	162.5	26.8	234.2	12.5	-6.8	19.0
21	59.6	170.7	227.4	45.1	297.2	55.1	-34.2	85.0
22	16.9	48.5	.0	9.8	36.2	2.5	2.6	.0
23	40.3	115.4	.0	22.2	80.9	12.3	2.7	10.2
24	55.3	158.3	3356.3	58.3	3446.7	9.4	5.9	.0
25	39.3	112.5	772.0	29.0	845.5	9.9	9.1	.0
26	72.2	206.5	270.4	49.4	371.8	55.7	-28.6	86.6
27	54.7	156.4	80.9	36.9	193.3	7.0	-89.9	97.4
TOTAL	2512.4	7931.8	18088.3	1851.4	23800.1	345.1	2.8	347.9

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1983
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3551.7	.0	937.3	2593.1	.0	.0	.0
2	5.2	13.1	.0	3.4	9.6	.0	.0	.0
3	160.4	441.9	.0	106.3	334.2	.3	.0	.0
4	66.5	183.3	.0	44.1	138.7	.1	.0	.0
5	59.0	147.8	334.2	46.2	422.2	13.1	13.3	.0
6	20.1	50.5	.0	14.7	24.6	11.0	11.0	.0
7	111.1	278.3	138.7	83.3	291.6	41.5	41.1	.0
8	48.4	121.2	2593.1	53.2	2649.0	11.7	11.7	.0
9	56.5	141.6	431.9	42.6	519.4	11.2	11.1	.0
10	41.3	103.5	.0	29.2	64.6	9.5	9.2	.0
11	28.8	72.0	24.6	20.8	70.0	5.7	5.6	.0
12	48.8	122.3	291.6	37.8	374.0	1.8	1.7	.1
13	41.3	103.4	2649.0	45.5	2698.9	7.9	7.8	.0
14	37.8	94.7	519.4	29.0	574.9	10.0	10.0	.0
15	37.4	93.7	64.6	26.8	125.9	5.4	-10.6	15.7
16	66.7	167.2	70.0	53.0	174.7	9.2	-15.0	25.2
17	51.8	129.7	374.0	38.7	427.0	37.7	37.6	.0
18	44.6	111.8	2698.9	49.2	2748.7	12.6	12.6	.0
19	28.0	70.2	574.9	21.8	618.7	4.5	3.5	.1
20	38.8	97.1	125.9	29.0	179.3	14.5	-7.0	20.1
21	59.6	149.4	174.7	49.2	216.9	57.4	-18.8	75.8
22	16.9	42.4	.0	11.3	28.3	2.8	2.7	.0
23	40.3	101.0	.0	26.0	62.8	12.1	1.2	9.4
24	55.3	138.5	2748.7	59.7	2818.7	8.4	8.0	.0
25	39.3	98.4	618.7	30.7	676.9	9.4	8.5	.0
26	72.2	180.7	207.5	53.7	268.2	66.1	-18.7	72.9
27	54.7	136.9	62.8	39.8	151.2	8.4	-83.6	87.4
TOTAL	2512.4	6942.4	14703.3	1982.1	19262.1	372.2	42.9	306.6

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1984
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	5070.2	.0	981.6	4074.8	.0	.0	.0
2	5.2	18.7	.0	3.6	15.1	.0	.0	.0
3	160.4	630.9	.0	113.6	517.9	.3	.0	.0
4	66.5	261.7	.0	47.1	215.0	.1	.0	.0
5	59.0	210.9	517.9	49.9	662.6	16.7	15.1	.0
6	20.1	72.0	.0	15.4	45.0	11.8	11.7	.0
7	111.1	397.3	215.0	88.2	479.7	45.0	44.3	.0
8	48.4	173.0	4074.8	53.2	4178.6	15.8	13.6	.0
9	56.5	202.1	677.8	44.9	821.6	13.7	13.4	.0
10	41.3	147.8	.0	31.3	105.5	11.2	10.9	.0
11	28.8	102.8	45.0	21.9	119.3	6.7	6.7	.0
12	48.8	174.6	479.7	39.8	612.5	2.2	2.0	.1
13	41.3	147.7	4178.6	45.4	4270.5	10.3	9.0	.0
14	37.8	135.2	821.6	30.2	914.2	12.5	10.8	.0
15	37.4	133.8	105.5	28.6	204.6	6.2	-12.1	15.7
16	66.7	238.7	119.3	54.9	293.1	9.8	-16.9	23.8
17	51.8	185.1	612.5	40.4	714.5	43.0	40.3	.0
18	44.6	159.7	4270.5	49.1	4365.1	15.9	14.4	.0
19	28.0	100.2	914.3	22.8	986.1	5.7	1.7	.1
20	38.8	138.6	204.6	30.0	298.1	15.4	-7.7	22.6
21	59.6	213.3	293.1	50.8	388.4	66.8	-10.5	77.2
22	16.9	60.6	.0	11.9	45.5	3.2	2.8	.0
23	40.3	144.2	.0	27.6	100.9	15.8	1.8	11.7
24	55.3	197.8	4365.2	59.6	4491.8	11.6	6.0	.0
25	39.3	140.5	986.2	32.0	1083.6	11.3	10.7	.0
26	72.2	258.0	343.6	55.1	476.8	70.0	-5.1	71.5
27	54.7	195.4	100.9	42.5	244.7	9.4	-81.8	89.7
TOTAL	2512.4	9910.6	23326.1	2071.4	30725.7	430.5	81.0	312.5

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1985
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	4151.5	.0	1009.0	3069.8	.0	.0	.0
2	5.2	15.3	.0	3.9	11.3	.0	.0	.0
3	160.4	516.6	.0	121.6	391.4	.3	.0	.0
4	66.5	214.3	.0	50.4	162.5	.1	.0	.0
5	59.0	172.7	391.4	51.6	493.3	15.9	15.6	.0
6	20.1	59.0	.0	16.3	29.7	12.5	12.3	.0
7	111.1	325.3	162.5	92.2	344.4	47.6	46.2	.0
8	48.4	141.6	3069.8	53.8	3143.9	13.1	12.9	.0
9	56.5	165.5	504.7	47.2	608.2	13.1	12.7	.0
10	41.3	121.0	.0	32.8	76.0	11.1	10.8	.0
11	28.8	84.2	29.7	23.2	83.3	6.7	6.6	.0
12	48.8	142.9	344.4	41.8	442.0	2.2	1.9	.1
13	41.3	120.9	3143.9	45.9	3209.7	8.7	8.6	.0
14	37.8	110.7	608.2	31.7	674.5	11.6	11.2	.0
15	37.4	109.5	76.0	30.0	148.0	6.5	-11.5	14.0
16	66.7	195.4	83.3	56.3	209.0	9.9	-16.8	19.7
17	51.8	151.6	442.0	42.6	508.2	41.4	40.8	.0
18	44.6	130.7	3209.7	49.7	3276.2	13.8	13.7	.0
19	28.0	82.0	674.5	23.8	726.8	5.2	2.5	.1
20	38.8	113.5	148.0	31.8	212.3	16.4	-8.4	21.9
21	59.6	174.6	209.0	52.0	265.4	62.8	-10.3	71.9
22	16.9	49.6	.0	12.7	33.4	3.2	3.0	.0
23	40.3	118.0	.0	29.9	73.4	14.0	1.7	11.0
24	55.3	161.9	3276.2	60.8	3366.9	9.5	7.4	.0
25	39.3	115.1	726.8	33.4	796.3	10.9	10.1	.0
26	72.2	211.3	245.6	58.8	320.2	75.9	2.4	64.0
27	54.7	160.0	73.4	44.7	177.4	9.7	-78.9	84.8
TOTAL	2512.4	8114.7	17419.2	2148.0	22853.6	422.1	94.4	287.4

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1986
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	2485.5	.0	909.3	1681.4	.0	.0	.0
2	5.2	9.2	.0	3.2	6.0	.0	.0	.0
3	160.4	309.3	.0	101.6	210.8	.3	.0	.0
4	66.5	128.3	.0	42.1	87.5	.1	.0	.0
5	59.0	103.4	210.8	45.7	258.3	13.4	14.8	.0
6	20.1	35.3	.0	14.1	13.4	8.4	8.6	.0
7	111.1	194.8	87.5	80.9	165.6	39.3	41.4	.0
8	48.4	84.8	1681.4	52.2	1705.9	9.2	9.4	.0
9	56.5	99.1	264.4	41.4	312.8	10.9	11.4	.0
10	41.3	72.4	.0	28.7	37.2	7.5	8.1	.0
11	28.8	50.4	13.4	20.0	39.3	5.3	5.5	.0
12	48.8	85.6	165.6	36.9	213.9	1.8	2.1	.1
13	41.3	72.4	1705.9	44.5	1728.1	6.5	6.7	.0
14	37.8	66.3	312.8	28.0	343.1	9.0	9.5	.0
15	37.4	65.6	37.2	26.4	72.2	5.3	-8.6	17.2
16	66.7	117.0	39.3	51.4	99.4	9.4	-11.2	23.9
17	51.8	90.7	213.9	37.4	241.0	27.6	28.1	.0
18	44.6	78.3	1728.1	48.1	1748.5	10.7	10.9	.0
19	28.0	49.1	343.1	21.1	368.0	3.9	3.5	.1
20	38.8	67.9	72.2	27.6	100.4	13.1	-8.1	24.9
21	59.6	104.6	99.4	47.3	117.6	43.7	-36.0	81.1
22	16.9	29.7	.0	10.6	17.5	2.0	2.8	.0
23	40.3	70.7	.0	24.9	37.8	8.7	2.3	11.0
24	55.3	96.9	1748.5	59.3	1780.9	6.5	6.9	.0
25	39.3	68.9	368.0	29.7	399.9	8.6	9.7	.0
26	72.2	126.5	117.8	50.7	144.2	51.4	-11.5	74.2
27	54.7	95.8	37.8	39.0	87.9	8.3	-81.4	95.0
TOTAL	2512.4	4858.3	9247.1	1921.9	12018.5	310.9	25.0	327.3

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1987
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	2736.5	.0	933.4	1805.0	.0	.0	.0
2	5.2	10.1	.0	3.5	6.6	.0	.0	.0
3	160.4	340.5	.0	111.3	228.9	.3	.0	.0
4	66.5	141.3	.0	46.1	95.1	.1	.0	.0
5	59.0	113.8	228.9	46.7	284.0	12.0	12.0	.0
6	20.1	38.9	.0	14.5	15.9	8.5	8.4	.0
7	111.1	214.4	95.1	82.8	189.9	36.8	36.3	.0
8	48.4	93.3	1805.0	52.3	1836.5	9.6	9.6	.0
9	56.5	109.1	290.5	42.5	347.0	10.1	9.9	.0
10	41.3	79.7	.0	29.8	41.9	8.0	8.0	.0
11	28.8	55.5	15.9	20.7	45.7	5.1	5.1	.0
12	48.8	94.2	189.9	37.4	245.1	1.7	1.5	.1
13	41.3	79.7	1836.5	44.7	1865.0	6.6	6.6	.0
14	37.8	73.0	347.0	28.8	382.6	8.6	8.5	.0
15	37.4	72.2	41.9	27.2	81.8	5.1	-8.8	14.6
16	66.7	128.8	45.7	50.8	116.1	7.6	-11.2	20.7
17	51.8	99.9	245.1	38.3	279.0	27.7	27.6	.0
18	44.6	86.2	1865.0	48.3	1892.1	10.8	10.8	.0
19	28.0	54.1	382.6	21.7	411.3	3.8	3.6	.1
20	38.8	74.8	81.8	28.2	116.3	12.1	-7.3	18.9
21	59.6	115.1	116.1	46.7	141.7	42.6	-31.7	74.0
22	16.9	32.7	.0	11.5	18.9	2.3	2.5	.0
23	40.3	77.8	.0	27.1	41.1	9.7	1.4	7.5
24	55.3	106.7	1892.1	58.3	1934.0	6.6	6.7	.0
25	39.3	75.8	411.3	30.5	448.4	8.2	8.0	.0
26	72.2	139.3	135.1	51.8	172.9	49.6	-15.6	65.1
27	54.7	105.5	41.1	40.5	98.1	7.9	-79.8	86.6
TOTAL	2512.4	5348.8	10066.5	1975.2	13140.7	301.3	12.0	287.5

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1988
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3397.2	.0	1092.8	2286.4	.0	.0	.0
2	5.2	12.5	.0	3.8	8.7	.0	.0	.0
3	160.4	422.7	.0	118.5	303.9	.3	.0	.0
4	66.5	175.4	.0	49.1	126.2	.1	.0	.0
5	59.0	141.3	303.9	56.5	372.0	16.8	16.6	.0
6	20.1	48.3	.0	17.1	20.2	11.0	11.0	.0
7	111.1	266.2	126.2	99.5	244.0	48.8	49.6	.0
8	48.4	115.9	2286.4	52.3	2338.9	10.9	10.9	.0
9	56.5	135.4	380.7	51.6	451.0	13.5	13.5	.0
10	41.3	99.0	.0	34.6	54.2	10.2	10.1	.0
11	28.8	68.9	20.2	24.3	57.9	6.9	6.9	.0
12	48.8	117.0	244.0	45.2	313.5	2.3	2.3	.1
13	41.3	98.9	2338.9	44.6	2385.6	7.5	7.4	.0
14	37.8	90.6	451.0	35.1	495.0	11.5	11.4	.0
15	37.4	89.6	54.2	31.9	105.1	6.7	-10.4	13.7
16	66.7	159.9	57.9	60.9	146.0	10.7	-15.2	19.3
17	51.8	124.0	313.5	45.0	356.7	35.8	35.9	.0
18	44.6	107.0	2385.6	48.2	2432.0	12.2	12.1	.0
19	28.0	67.1	495.0	26.4	530.7	5.1	3.0	.1
20	38.8	92.8	105.1	33.5	147.8	16.6	-8.2	24.2
21	59.6	142.9	146.0	55.9	179.3	53.6	-11.2	64.5
22	16.9	40.6	.0	12.6	25.3	2.7	2.6	.0
23	40.3	96.6	.0	29.1	55.1	12.4	.5	10.5
24	55.3	132.5	2432.0	59.6	2496.6	8.1	7.0	.0
25	39.3	94.2	530.7	36.9	577.0	11.0	11.2	.0
26	72.2	172.9	173.2	61.5	219.4	65.1	6.0	58.7
27	54.7	130.9	55.1	48.1	127.7	10.3	-67.4	76.3
TOTAL	2512.4	6640.3	12899.6	2274.6	16856.3	389.9	105.5	267.4

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1989
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3673.7	.0	942.5	2735.0	.0	.0	.0
2	5.2	13.5	.0	3.5	10.0	.0	.0	.0
3	160.4	457.1	.0	109.4	347.5	.3	.0	.0
4	66.5	189.6	.0	45.4	144.2	.1	.0	.0
5	59.0	152.8	347.5	47.9	438.3	14.2	15.2	.0
6	20.1	52.2	.0	14.8	25.7	11.7	11.7	.0
7	111.1	287.9	144.2	85.1	304.7	42.3	42.5	.0
8	48.4	125.3	2735.0	54.6	2793.7	12.1	12.1	.0
9	56.5	146.4	448.3	44.2	538.4	12.1	12.3	.0
10	41.3	107.1	.0	30.0	66.9	10.2	10.2	.0
11	28.8	74.5	25.7	21.1	73.2	6.0	6.0	.0
12	48.8	126.5	304.7	38.9	390.3	2.0	1.9	.1
13	41.3	107.0	2793.7	46.6	2846.0	8.1	8.1	.0
14	37.8	97.9	538.4	30.3	595.2	10.8	10.9	.0
15	37.4	96.9	66.9	27.4	130.6	5.8	-10.5	15.8
16	66.7	172.9	73.2	53.4	183.8	9.2	-14.3	22.5
17	51.8	134.1	390.3	38.8	446.3	39.4	39.4	.0
18	44.6	115.7	2846.0	50.3	2898.8	12.6	12.6	.0
19	28.0	72.6	595.2	22.7	640.4	4.7	3.6	.1
20	38.8	100.4	130.6	29.1	187.2	14.7	-8.1	22.8
21	59.6	154.5	183.8	49.4	231.7	57.6	-13:2	71.1
22	16.9	43.9	.0	11.5	29.2	3.1	2.7	.0
23	40.3	104.4	.0	27.1	64.8	12.6	1.7	10.5
24	55.3	143.3	2898.8	59.7	2973.8	8.6	8.6	.0
25	39.3	101.8	640.4	31.1	701.6	9.6	9.6	.0
26	72.2	186.9	216.5	53.4	281.7	68.3	2.6	65.4
27	54.7	141.6	64.8	41.3	156.3	8.8	-74.8	83.9
TOTAL	2512.4	7180.7	15444.1	2009.4	20235.4	384.9	90.9	292.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1990
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	6181.8	.0	1147.2	4963.0	.0	.0	.0
2	5.2	22.8	.0	4.5	18.3	.0	.0	.0
3	160.4	769.2	.0	138.1	630.6	.3	.0	.0
4	66.5	319.1	.0	57.3	261.7	.1	.0	.0
5	59.0	257.2	630.6	58.3	809.7	19.7	17.0	.0
6	20.1	87.8	.0	18.5	53.1	16.2	16.0	.0
7	111.1	484.4	261.7	105.4	585.8	54.9	53.1	.0
8	48.4	210.9	4963.0	55.9	5098.9	18.3	17.1	.0
9	56.5	246.4	828.1	54.2	1003.9	16.5	16.0	.0
10	41.3	180.2	.0	37.4	127.3	15.5	14.6	.0
11	28.8	125.4	53.1	26.3	144.1	8.1	7.9	.0
12	48.8	212.8	585.8	47.3	748.7	2.6	2.2	.1
13	41.3	180.1	5098.9	47.7	5219.0	11.7	10.7	.0
14	37.8	164.8	1003.9	36.1	1117.5	15.0	13.8	.0
15	37.4	163.1	127.3	34.1	248.6	7.7	-13.8	11.1
16	66.7	291.0	144.1	64.0	357.8	11.6	-19.5	15.6
17	51.8	225.7	748.7	48.2	869.4	56.8	55.4	.0
18	44.6	194.7	5219.0	51.6	5343.4	18.0	17.5	.0
19	28.0	122.2	1117.5	27.0	1205.8	6.8	-2.3	.1
20	38.8	168.9	248.6	36.1	362.1	19.3	-9.2	20.0
21	59.6	260.1	357.8	58.8	474.5	81.8	24.5	55.4
22	16.9	73.8	.0	14.6	54.3	4.9	3.4	.0
23	40.3	175.8	.0	34.4	121.3	20.1	1.1	8.9
24	55.3	241.1	5343.4	63.9	5506.1	13.9	3.6	.0
25	39.3	171.3	1206.0	38.0	1325.6	13.8	12.7	.0
26	72.2	314.6	416.4	67.0	571.6	92.4	32.6	48.2
27	54.7	238.3	121.3	51.2	296.9	11.5	-60.3	64.6
TOTAL	2512.4	12083.4	28475.1	2423.2	37518.8	537.6	214.0	223.9

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1991
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	4138.7	.0	914.9	3268.9	.0	.0	.0
2	5.2	15.3	.0	3.4	11.8	.0	.0	.0
3	160.4	515.0	.0	107.4	407.4	.3	.0	.0
4	66.5	213.6	.0	44.5	169.0	.1	.0	.0
5	59.0	172.2	407.4	45.5	519.6	14.5	15.2	.0
6	20.1	58.8	.0	14.4	32.4	11.9	12.0	.0
7	111.1	324.3	169.0	81.7	368.7	43.0	44.1	.0
8	48.4	141.2	3268.9	54.2	3342.7	13.6	13.7	.0
9	56.5	165.0	531.4	41.5	642.6	12.3	12.5	.0
10	41.3	120.6	.0	29.0	80.6	11.0	11.4	.0
11	28.8	83.9	32.4	20.5	89.7	6.2	6.3	.0
12	48.8	142.5	368.7	36.9	472.2	2.0	2.1	.1
13	41.3	120.5	3342.7	46.3	3408.3	9.0	9.2	.0
14	37.8	110.3	642.6	28.2	713.6	11.2	11.3	.0
15	37.4	109.2	80.6	26.4	157.5	5.9	-9.3	16.5
16	66.7	194.8	89.7	52.1	223.4	10.0	-12.0	23.6
17	51.8	151.1	472.2	37.7	543.7	42.0	42.2	.0
18	44.6	130.3	3408.3	50.1	3474.7	14.2	14.3	.0
19	28.0	81.8	713.6	21.3	769.0	5.0	2.4	.1
20	38.8	113.1	157.5	28.3	227.3	15.0	-10.0	31.4
21	59.6	174.1	223.4	48.3	288.0	62.7	-8.9	72.9
22	16.9	49.4	.0	11.4	34.8	3.3	3.7	.0
23	40.3	117.7	.0	26.7	77.4	13.6	3.6	16.5
24	55.3	161.4	3474.7	60.8	3565.8	9.9	8.6	.0
25	39.3	114.7	769.1	30.0	843.5	10.3	10.7	.0
26	72.2	210.6	262.1	52.4	350.8	69.5	0.3	67.4
27	54.7	159.5	77.4	39.5	188.5	8.9	-71.1	85.5
TOTAL	2512.4	8089.8	18491.7	1953.5	24272.0	405.3	120.3	314.0

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1992
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	2380.6	.0	791.8	1631.2	.0	.0	.0
2	5.2	8.8	.0	2.8	5.9	.0	.0	.0
3	160.4	296.2	.0	89.9	206.1	.3	.0	.0
4	66.5	122.9	.0	37.3	85.6	.1	.0	.0
5	59.0	99.0	206.1	40.0	253.6	11.6	12.4	.0
6	20.1	33.8	.0	12.4	13.0	8.4	8.5	.0
7	111.1	186.5	85.6	71.1	166.2	34.9	35.8	.0
8	48.4	81.2	1631.2	51.6	1652.2	9.1	9.3	.0
9	56.5	94.9	259.5	36.7	307.8	10.0	10.2	.0
10	41.3	69.4	.0	25.4	36.8	7.2	7.9	.0
11	28.8	48.3	13.0	17.7	38.8	4.8	4.9	.0
12	48.8	82.0	166.2	32.3	214.3	1.6	1.8	.1
13	41.3	69.3	1652.2	44.1	1671.4	6.4	6.7	.0
14	37.8	63.5	307.8	25.0	337.9	8.3	8.7	.0
15	37.4	62.8	36.8	23.1	71.8	4.7	-6.6	17.9
16	66.7	112.1	38.8	44.7	99.1	7.7	-7.9	25.2
17	51.8	86.9	214.3	33.0	241.5	26.7	26.9	.0
18	44.6	75.0	1671.4	47.6	1688.7	10.4	10.6	.0
19	28.0	47.0	337.9	18.8	362.6	3.6	3.7	.1
20	38.8	65.1	71.8	24.3	100.8	11.7	-8.9	23.9
21	59.6	100.1	99.1	41.7	116.5	42.3	-38.4	81.8
22	16.9	28.4	.0	9.4	17.1	1.9	3.0	.0
23	40.3	67.7	.0	22.0	37.1	8.6	2.9	11.9
24	55.3	92.9	1688.7	57.2	1718.8	6.0	6.6	.0
25	39.3	66.0	362.6	26.4	394.6	7.6	8.4	.0
26	72.2	121.1	117.9	44.9	142.9	51.2	-15.4	76.0
27	54.7	91.8	37.1	34.7	86.7	7.5	-83.8	96.3
TOTAL	2512.4	4653.2	8997.8	1705.9	11698.7	292.5	7.0	333.1

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1993
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3408.5	.0	985.3	2379.0	.0	.0	.0
2	5.2	12.6	.0	3.8	8.8	.0	.0	.0
3	160.4	424.1	.0	117.9	305.8	.3	.0	.0
4	66.5	175.9	.0	48.9	127.0	.1	.0	.0
5	59.0	141.8	305.8	49.3	384.1	14.2	13.9	.0
6	20.1	48.4	.0	15.6	21.5	11.3	11.1	.0
7	111.1	267.1	127.0	88.6	262.7	42.7	41.3	.0
8	48.4	116.3	2379.0	52.7	2430.9	11.2	11.0	.0
9	56.5	135.9	392.9	45.0	472.4	11.4	11.0	.0
10	41.3	99.3	.0	31.5	57.8	10.0	9.5	.0
11	28.8	69.1	21.5	22.1	62.6	5.9	5.8	.0
12	48.8	117.3	262.7	39.9	338.2	1.9	1.6	.1
13	41.3	99.3	2430.9	45.0	2477.2	7.6	7.4	.0
14	37.8	90.9	472.4	30.3	522.9	10.0	9.7	.0
15	37.4	89.9	57.8	28.7	113.2	5.8	-9.1	12.9
16	66.7	160.4	62.6	54.2	158.6	9.0	-12.6	18.1
17	51.8	124.4	338.2	40.8	385.7	36.1	35.8	.0
18	44.6	107.3	2477.2	48.7	2523.3	12.2	12.2	.0
19	28.0	67.4	522.9	22.9	563.0	4.4	3.8	.1
20	38.8	93.2	113.2	30.5	160.9	14.9	-8.4	19.9
21	59.6	143.4	158.6	49.7	196.2	54.1	-12.0	64.5
22	16.9	40.7	.0	12.4	25.3	3.0	2.8	.0
23	40.3	96.9	.0	29.0	55.8	12.1	.8	7.5
24	55.3	132.9	2523.3	59.3	2588.8	7.8	7.5	.0
25	39.3	94.5	563.0	32.3	615.6	9.5	8.6	.0
26	72.2	173.5	186.2	56.4	236.5	66.7	-2.2	56.8
27	54.7	131.4	55.8	42.9	135.5	8.8	-74.8	76.5
TOTAL	2512.4	6662.5	13451.2	2084.0	17609.5	371.1	74.6	256.2

(7) Under Draft with Irrigation Water Demand <Shallow Aquifer Draft>

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1980
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3689.2	.0	1025.4	2691.3	.0	.0	.0
2	5.2	13.6	.0	3.7	9.9	.0	.0	.0
3	160.4	459.1	.0	116.7	342.6	.3	.0	.0
4	66.5	190.4	.0	48.4	141.9	.1	.0	.0
5	59.0	153.5	342.6	50.7	431.4	15.2	12.3	.0
6	20.1	52.4	.0	15.8	26.2	10.7	11.2	.0
7	111.1	289.1	141.9	91.7	297.8	44.9	40.5	.0
8	48.4	125.8	2691.3	53.9	2744.1	11.7	11.6	.0
9	56.5	147.0	441.2	46.5	529.2	12.6	12.1	.0
10	41.3	107.5	.0	32.1	65.3	10.1	9.2	.0
11	28.8	74.8	26.2	22.3	72.7	6.0	6.5	.0
12	48.8	127.0	297.8	40.9	381.9	2.1	2.0	.1
13	41.3	107.5	2744.1	46.0	2797.7	7.6	7.5	.0
14	37.8	98.4	529.2	31.6	585.3	11.1	-10.8	22.3
15	37.4	97.3	65.3	29.3	127.4	5.9	-4.9	13.7
16	66.7	173.7	72.7	54.5	182.0	8.4	-8.2	22.6
17	51.8	134.7	381.9	41.1	439.4	36.2	25.8	30.5
18	44.6	116.2	2797.7	49.7	2850.8	11.4	11.4	.0
19	28.0	72.9	585.3	23.4	625.4	9.4	-1.8	11.9
20	38.8	100.8	127.4	30.7	183.1	14.4	2.2	15.0
21	59.6	155.2	182.0	50.5	237.3	62.4	53.8	27.6
22	16.9	44.1	.0	12.2	28.8	3.0	3.3	.0
23	40.3	104.9	.0	28.8	63.5	12.6	9.8	6.4
24	55.3	143.9	2850.8	60.6	2917.1	7.5	6.3	.0
25	39.3	102.3	625.4	32.3	658.1	38.4	18.2	23.2
26	72.2	187.7	211.9	56.9	280.6	63.6	28.6	45.7
27	54.7	142.2	63.5	43.7	152.9	9.4	-17.2	32.2
TOTAL	2512.4	7211.2	15178.3	2139.2	19863.6	415.0	229.5	251.0

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1981
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3615.5	.0	931.8	2743.4	.0	.0	.0
2	5.2	13.3	.0	3.0	10.3	.0	.0	.0
3	160.4	449.9	.0	97.3	352.6	.3	.0	.0
4	66.5	186.6	.0	40.3	146.2	.1	.0	.0
5	59.0	150.4	352.6	47.0	443.7	12.3	14.1	.0
6	20.1	51.4	.0	14.0	29.5	7.9	8.2	.0
7	111.1	283.3	146.2	82.4	314.5	32.6	35.8	.0
8	48.4	123.3	2743.4	52.8	2802.5	12.2	12.1	.0
9	56.5	144.1	454.0	41.4	546.8	9.9	11.0	.0
10	41.3	105.4	.0	27.6	69.9	7.9	8.9	.0
11	28.8	73.3	29.5	19.5	78.6	4.7	5.0	.0
12	48.8	124.5	314.5	37.7	399.6	1.7	2.2	.1
13	41.3	105.3	2802.5	45.1	2855.0	8.2	8.4	.0
14	37.8	96.4	546.8	28.6	605.4	9.3	-14.5	32.5
15	37.4	95.4	69.9	25.4	135.5	4.4	-5.3	20.2
16	66.7	170.2	78.6	52.4	189.5	7.8	-5.0	33.3
17	51.8	132.0	399.6	36.6	466.0	29.1	-15.3	44.6
18	44.6	113.9	2855.0	48.8	2907.5	13.1	13.3	.0
19	28.0	71.4	605.4	21.6	647.0	8.2	-1.6	17.5
20	38.8	98.8	135.5	28.0	194.9	11.4	-1.2	22.1
21	59.6	152.1	189.5	49.7	250.1	43.7	5.4	40.8
22	16.9	43.2	.0	10.2	30.6	2.4	3.6	.0
23	40.3	102.8	.0	23.7	67.8	11.3	9.4	9.5
24	55.3	141.0	2907.5	60.4	2979.7	9.0	8.2	.0
25	39.3	100.2	647.0	29.6	686.8	30.8	6.2	33.8
26	72.2	184.0	225.5	50.8	310.5	48.2	3.7	66.4
27	54.7	139.4	67.8	39.1	161.3	6.8	-30.7	47.0
TOTAL	2512.4	7067.1	15571.0	1944.9	20425.3	332.9	82.0	367.9

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1982
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	4057.9	.0	883.5	3152.8	.0	.0	.0
2	5.2	15.0	.0	2.9	12.0	.0	.0	.0
3	160.4	504.9	.0	92.8	411.6	.3	.0	.0
4	66.5	209.5	.0	38.5	170.9	.1	.0	.0
5	59.0	168.8	411.6	44.2	523.2	13.1	12.8	.0
6	20.1	57.6	.0	13.4	35.5	8.8	8.7	.0
7	111.1	318.0	170.9	77.6	376.7	34.7	33.8	.0
8	48.4	138.4	3152.8	52.0	3225.7	13.3	12.3	.0
9	56.5	161.7	535.2	39.8	646.3	10.8	10.9	.0
10	41.3	118.3	.0	26.1	83.9	8.3	8.6	.0
11	28.8	82.3	35.5	18.9	93.8	5.0	5.0	.0
12	48.8	139.7	376.7	35.8	478.7	1.9	1.7	.1
13	41.3	118.2	3225.7	44.4	3290.6	8.8	8.6	.0
14	37.8	108.2	646.3	27.1	717.1	10.2	-17.8	35.4
15	37.4	107.1	83.9	24.0	162.5	4.4	-6.2	22.0
16	66.7	191.0	93.8	48.7	227.4	8.7	-9.3	36.4
17	51.8	148.2	478.7	35.7	557.3	33.8	-14.7	48.5
18	44.6	127.8	3290.6	48.0	3356.3	13.9	14.0	.0
19	28.0	80.2	717.1	20.4	767.7	9.3	-4.8	19.1
20	38.8	110.9	162.5	26.8	234.2	12.5	-2.8	24.1
21	59.6	170.7	227.4	45.1	297.2	55.1	10.7	44.3
22	16.9	48.5	.0	9.8	36.2	2.5	3.9	.0
23	40.3	115.4	.0	22.2	80.9	12.3	6.7	10.5
24	55.3	158.3	3356.3	58.3	3446.6	9.5	9.1	.0
25	39.3	112.5	767.7	28.4	815.6	36.2	-1.0	36.8
26	72.2	206.5	270.4	49.4	371.8	55.7	-14.4	72.3
27	54.7	156.4	80.9	36.9	193.3	7.0	-42.9	51.2
TOTAL	2512.4	7931.8	18083.8	1850.6	23765.6	375.9	32.8	400.4

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1983
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3551.7	.0	937.3	2593.1	.0	.0	.0
2	5.2	13.1	.0	3.4	9.6	.0	.0	.0
3	160.4	441.9	.0	106.3	334.2	.3	.0	.0
4	66.5	183.3	.0	44.1	138.7	.1	.0	.0
5	59.0	147.8	334.2	46.2	422.2	13.1	13.3	.0
6	20.1	50.5	.0	14.7	24.6	11.0	11.0	.0
7	111.1	278.3	138.7	83.3	291.6	41.5	41.1	.0
8	48.4	121.2	2593.1	53.2	2649.0	11.7	11.7	.0
9	56.5	141.6	431.9	42.6	519.4	11.2	11.2	.0
10	41.3	103.5	.0	29.2	64.6	9.5	9.3	.0
11	28.8	72.0	24.6	20.8	70.0	5.7	5.7	.0
12	48.8	122.3	291.6	37.8	374.0	1.8	1.7	.1
13	41.3	103.4	2649.0	45.5	2698.9	7.9	7.9	.0
14	37.8	94.7	519.4	29.0	574.9	10.0	-19.0	30.0
15	37.4	93.7	64.6	26.8	125.9	5.4	-8.1	18.7
16	66.7	167.2	70.0	53.0	174.7	9.2	-14.2	30.9
17	51.8	129.7	374.0	38.7	427.0	37.7	-3.5	41.1
18	44.6	111.8	2698.9	49.2	2748.7	12.6	12.7	.0
19	28.0	70.2	574.9	21.7	614.6	8.6	-7.4	16.2
20	38.8	97.1	125.9	29.0	179.3	14.5	-3.9	20.4
21	59.6	149.4	174.7	49.2	216.9	57.4	19.7	37.6
22	16.9	42.4	.0	11.3	28.3	2.8	3.5	.0
23	40.3	101.0	.0	26.0	62.8	12.1	4.5	8.9
24	55.3	138.5	2748.7	59.7	2818.7	8.4	7.4	.0
25	39.3	98.4	614.6	30.0	644.0	38.8	4.7	31.2
26	72.2	180.7	207.5	53.7	268.2	66.1	-5.4	61.4
27	54.7	136.9	62.8	39.8	151.2	8.4	-38.9	43.4
TOTAL	2512.4	6942.4	14699.2	1981.4	19225.2	405.7	65.0	339.9

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1984
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	5070.2	.0	981.6	4074.8	.0	.0	.0
2	5.2	18.7	.0	3.6	15.1	.0	.0	.0
3	160.4	630.9	.0	113.6	517.9	.3	.0	.0
4	66.5	261.7	.0	47.1	215.0	.1	.0	.0
5	59.0	210.9	517.9	49.9	662.6	16.7	15.1	.0
6	20.1	72.0	.0	15.4	45.0	11.8	11.7	.0
7	111.1	397.3	215.0	88.2	479.7	45.0	44.3	.0
8	48.4	173.0	4074.8	53.2	4178.6	15.8	13.6	.0
9	56.5	202.1	677.8	44.9	821.6	13.7	13.3	.0
10	41.3	147.8	.0	31.3	105.5	11.2	11.0	.0
11	28.8	102.8	45.0	21.9	119.3	6.7	6.7	.0
12	48.8	174.6	479.7	39.8	612.5	2.2	2.0	.1
13	41.3	147.7	4178.6	45.4	4270.5	10.3	9.1	.0
14	37.8	135.2	821.6	30.2	914.2	12.6	-22.8	29.0
15	37.4	133.8	105.5	28.6	204.6	6.2	-10.5	17.7
16	66.7	238.7	119.3	54.9	293.1	9.8	-16.8	29.3
17	51.8	185.1	612.5	40.4	714.5	43.1	3.3	39.7
18	44.6	159.7	4270.5	49.1	4365.1	15.9	14.5	.0
19	28.0	100.2	914.2	22.6	980.7	11.2	-7.2	15.5
20	38.8	138.6	204.6	30.0	298.1	15.4	-4.3	19.4
21	59.6	213.3	293.1	50.8	388.4	66.8	30.4	36.1
22	16.9	60.6	.0	11.9	45.5	3.2	3.3	.0
23	40.3	144.2	.0	27.6	100.9	15.8	4.3	8.2
24	55.3	197.8	4365.2	59.6	4491.8	11.6	6.1	.0
25	39.3	140.5	980.7	31.1	1045.7	44.6	12.4	30.2
26	72.2	258.0	343.6	55.1	476.8	70.0	7.0	59.3
27	54.7	195.4	100.9	42.5	244.7	9.4	-34.5	41.9
TOTAL	2512.4	9910.6	23320.6	2070.4	30682.2	469.4	112.1	326.3

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1985
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	4151.5	.0	1009.0	3069.8	.0	.0	.0
2	5.2	15.3	.0	3.9	11.3	.0	.0	.0
3	160.4	516.6	.0	121.6	391.4	.3	.0	.0
4	66.5	214.3	.0	50.4	162.5	.1	.0	.0
5	59.0	172.7	391.4	51.6	493.3	15.9	15.6	.0
6	20.1	59.0	.0	16.3	29.7	12.5	12.3	.0
7	111.1	325.3	162.5	92.2	344.4	47.6	46.2	.0
8	48.4	141.6	3069.8	53.8	3143.9	13.1	12.9	.0
9	56.5	165.5	504.7	47.2	608.2	13.1	12.4	.0
10	41.3	121.0	.0	32.8	76.0	11.1	10.8	.0
11	28.8	84.2	29.7	23.2	83.3	6.7	6.6	.0
12	48.8	142.9	344.4	41.8	442.0	2.2	1.9	.1
13	41.3	120.9	3143.9	45.9	3209.7	8.7	8.6	.0
14	37.8	110.7	608.2	31.7	674.5	11.6	-21.0	25.4
15	37.4	109.5	76.0	30.0	148.0	6.5	-11.0	15.0
16	66.7	195.4	83.3	56.3	209.0	9.9	-17.4	24.6
17	51.8	151.6	442.0	42.6	508.2	41.4	6.4	34.8
18	44.6	130.7	3209.7	49.7	3276.2	13.8	13.7	.0
19	28.0	82.0	674.5	23.7	722.1	10.0	-6.3	13.2
20	38.8	113.5	148.0	31.8	212.3	16.4	-4.5	16.5
21	59.6	174.6	209.0	52.0	265.4	62.8	30.9	30.9
22	16.9	49.6	.0	12.7	33.4	3.2	3.2	.0
23	40.3	118.0	.0	29.9	73.4	14.0	4.8	6.6
24	55.3	161.9	3276.2	60.8	3366.8	9.6	8.7	.0
25	39.3	115.1	722.1	32.9	758.6	44.7	14.2	26.4
26	72.2	211.3	245.6	58.8	320.2	75.9	14.2	52.3
27	54.7	160.0	73.4	44.7	177.4	9.7	-30.5	36.7
TOTAL	2512.4	8114.7	17414.5	2147.4	22811.1	460.7	132.5	282.3

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1986
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	2485.5	.0	909.3	1681.4	.0	.0	.0
2	5.2	9.2	.0	3.2	6.0	.0	.0	.0
3	160.4	309.3	.0	101.6	210.8	.3	.0	.0
4	66.5	128.3	.0	42.1	87.5	.1	.0	.0
5	59.0	103.4	210.8	45.7	258.3	13.4	14.8	.0
6	20.1	35.3	.0	14.1	13.4	8.4	8.6	.0
7	111.1	194.8	87.5	80.9	165.6	39.3	41.4	.0
8	48.4	84.8	1681.4	52.2	1705.9	9.2	9.4	.0
9	56.5	99.1	264.4	41.4	312.8	10.9	11.5	.0
10	41.3	72.4	.0	28.7	37.2	7.5	8.1	.0
11	28.8	50.4	13.4	20.0	39.3	5.3	5.5	.0
12	48.8	85.6	165.6	36.9	213.9	1.8	2.1	.1
13	41.3	72.4	1705.9	44.5	1728.1	6.5	6.7	.0
14	37.8	66.3	312.8	28.0	343.1	9.0	-17.7	29.8
15	37.4	65.6	37.2	26.4	72.2	5.3	-8.8	18.0
16	66.7	117.0	39.3	51.4	99.4	9.4	-12.7	29.7
17	51.8	90.7	213.9	37.4	241.0	27.6	-12.9	40.8
18	44.6	78.3	1728.1	48.1	1748.5	10.7	10.9	.0
19	28.0	49.1	343.1	21.0	364.6	7.4	-5.9	15.8
20	38.8	67.9	72.2	27.6	100.4	13.1	-3.5	19.8
21	59.6	104.6	99.4	47.3	117.6	43.7	7.9	36.8
22	16.9	29.7	.0	10.6	17.5	2.0	2.9	.0
23	40.3	70.7	.0	24.9	37.8	8.7	5.3	8.2
24	55.3	96.9	1748.5	59.3	1780.9	6.5	7.9	.0
25	39.3	68.9	364.6	28.8	376.0	29.8	3.8	31.0
26	72.2	126.5	117.8	50.7	144.2	51.4	.9	61.1
27	54.7	95.8	37.8	39.0	87.9	8.3	-30.7	43.0
TOTAL	2512.4	4858.3	9243.7	1920.8	11991.2	335.6	55.5	334.0

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1987
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	2736.5	.0	933.4	1805.0	.0	.0	.0
2	5.2	10.1	.0	3.5	6.6	.0	.0	.0
3	160.4	340.5	.0	111.3	228.9	.3	.0	.0
4	66.5	141.3	.0	46.1	95.1	.1	.0	.0
5	59.0	113.8	228.9	46.7	284.0	12.0	12.0	.0
6	20.1	38.9	.0	14.5	15.9	8.5	8.4	.0
7	111.1	214.4	95.1	82.8	189.9	36.8	36.3	.0
8	48.4	93.3	1805.0	52.3	1836.5	9.6	9.6	.0
9	56.5	109.1	290.5	42.5	347.0	10.1	10.1	.0
10	41.3	79.7	.0	29.8	41.9	8.0	8.0	.0
11	28.8	55.5	15.9	20.7	45.7	5.1	5.1	.0
12	48.8	94.2	189.9	37.4	245.1	1.7	1.6	.1
13	41.3	79.7	1836.5	44.7	1865.0	6.6	6.7	.0
14	37.8	73.0	347.0	28.8	382.6	8.6	-14.3	25.9
15	37.4	72.2	41.9	27.2	81.8	5.1	-8.6	15.6
16	66.7	128.8	45.7	50.8	116.1	7.6	-12.8	25.6
17	51.8	99.9	245.1	38.3	279.0	27.7	-7.9	35.5
18	44.6	86.2	1865.0	48.3	1892.1	10.8	10.8	.0
19	28.0	54.1	382.6	21.5	407.9	7.2	-6.0	13.7
20	38.8	74.8	81.8	28.2	116.3	12.1	-3.4	17.1
21	59.6	115.1	116.1	46.7	141.7	42.6	10.5	32.0
22	16.9	32.7	.0	11.5	18.9	2.3	2.7	.0
23	40.3	77.8	.0	27.1	41.1	9.7	4.0	7.1
24	55.3	106.7	1892.1	58.3	1934.0	6.6	6.9	.0
25	39.3	75.8	407.9	29.8	424.2	29.8	2.3	27.0
26	72.2	139.3	135.1	51.8	172.9	49.6	-3.9	53.2
27	54.7	105.5	41.1	40.5	98.1	7.9	-30.5	37.5
TOTAL	2512.4	5348.8	10063.2	1974.4	13113.2	326.3	47.5	290.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1988
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3397.2	.0	1092.8	2286.4	.0	.0	.0
2	5.2	12.5	.0	3.8	8.7	.0	.0	.0
3	160.4	422.7	.0	118.5	303.9	.3	.0	.0
4	66.5	175.4	.0	49.1	126.2	.1	.0	.0
5	59.0	141.3	303.9	56.5	372.0	16.8	16.6	.0
6	20.1	48.3	.0	17.1	20.2	11.0	11.0	.0
7	111.1	266.2	126.2	99.5	244.0	48.8	49.6	.0
8	48.4	115.9	2286.4	52.3	2338.9	10.9	10.9	.0
9	56.5	135.4	380.7	51.6	451.0	13.5	13.3	.0
10	41.3	99.0	.0	34.6	54.2	10.2	10.1	.0
11	28.8	68.9	20.2	24.3	57.9	6.9	6.9	.0
12	48.8	117.0	244.0	45.2	313.5	2.3	2.3	.1
13	41.3	98.9	2338.9	44.6	2385.6	7.5	7.3	.0
14	37.8	90.6	451.0	35.1	495.0	11.5	-17.0	23.7
15	37.4	89.6	54.2	31.9	105.1	6.7	-11.0	14.4
16	66.7	159.9	57.9	60.9	146.0	10.7	-17.2	23.7
17	51.8	124.0	313.5	45.0	356.7	35.8	3.4	32.4
18	44.6	107.0	2385.6	48.2	2432.0	12.2	12.1	.0
19	28.0	67.1	495.0	26.3	526.2	9.7	-7.4	12.6
20	38.8	92.8	105.1	33.5	147.8	16.6	-3.1	15.8
21	59.6	142.9	146.0	55.9	179.3	53.6	24.5	29.3
22	16.9	40.6	.0	12.6	25.3	2.7	2.5	.0
23	40.3	96.6	.0	29.1	55.1	12.4	3.9	6.7
24	55.3	132.5	2432.0	59.6	2496.6	8.1	7.2	.0
25	39.3	94.2	526.2	35.8	546.1	38.5	14.2	24.6
26	72.2	172.9	173.2	61.5	219.4	65.1	17.4	48.5
27	54.7	130.9	55.1	48.1	127.7	10.3	-23.9	34.2
TOTAL	2512.4	6640.3	12895.0	2273.4	16820.8	422.0	133.5	265.8

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1989
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3673.7	.0	942.5	2735.0	.0	.0	.0
2	5.2	13.5	.0	3.5	10.0	.0	.0	.0
3	160.4	457.1	.0	109.4	347.5	.3	.0	.0
4	66.5	189.6	.0	45.4	144.2	.1	.0	.0
5	59.0	152.8	347.5	47.9	438.3	14.2	15.2	.0
6	20.1	52.2	.0	14.8	25.7	11.7	11.7	.0
7	111.1	287.9	144.2	85.1	304.7	42.3	42.5	.0
8	48.4	125.3	2735.0	54.6	2793.7	12.1	12.1	.0
9	56.5	146.4	448.3	44.2	538.4	12.1	12.3	.0
10	41.3	107.1	.0	30.0	66.9	10.2	10.2	.0
11	28.8	74.5	25.7	21.1	73.2	6.0	6.0	.0
12	48.8	126.5	304.7	38.9	390.3	2.0	1.9	.1
13	41.3	107.0	2793.7	46.6	2846.0	8.1	8.1	.0
14	37.8	97.9	538.4	30.3	595.2	10.8	-15.9	26.6
15	37.4	96.9	66.9	27.4	130.6	5.8	-11.1	16.5
16	66.7	172.9	73.2	53.4	183.8	9.2	-17.0	27.3
17	51.8	134.1	390.3	38.8	446.3	39.4	3.0	36.4
18	44.6	115.7	2846.0	50.3	2898.8	12.6	12.6	.0
19	28.0	72.6	595.2	22.5	636.2	9.1	-5.4	14.3
20	38.8	100.4	130.6	29.1	187.2	14.7	-3.1	18.1
21	59.6	154.5	183.8	49.4	231.7	57.6	24.4	33.3
22	16.9	43.9	.0	11.5	29.2	3.1	2.7	.0
23	40.3	104.4	.0	27.1	64.8	12.6	4.5	8.0
24	55.3	143.3	2898.8	59.7	2973.8	8.6	8.5	.0
25	39.3	101.8	636.2	30.1	668.3	39.7	11.6	27.6
26	72.2	186.9	216.5	53.4	281.7	68.3	13.5	54.2
27	54.7	141.6	64.8	41.3	156.3	8.8	-29.5	38.4
TOTAL	2512.4	7180.7	15439.9	2008.2	20197.9	419.4	118.6	300.8

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1990
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	6181.8	.0	1147.2	4963.0	.0	.0	.0
2	5.2	22.8	.0	4.5	18.3	.0	.0	.0
3	160.4	769.2	.0	138.1	630.6	.3	.0	.0
4	66.5	319.1	.0	57.3	261.7	.1	.0	.0
5	59.0	257.2	630.6	58.3	809.7	19.7	17.1	.0
6	20.1	87.8	.0	18.5	53.1	16.2	16.0	.0
7	111.1	484.4	261.7	105.4	585.8	54.9	53.1	.0
8	48.4	210.9	4963.0	55.9	5098.9	18.3	17.1	.0
9	56.5	246.4	828.1	54.2	1003.9	16.5	15.8	.0
10	41.3	180.2	.0	37.4	127.3	15.5	14.7	.0
11	28.8	125.4	53.1	26.3	144.1	8.1	7.9	.0
12	48.8	212.8	585.8	47.3	748.7	2.6	2.2	.1
13	41.3	180.1	5098.9	47.7	5219.0	11.7	10.7	.0
14	37.8	164.8	1003.9	36.1	1117.5	15.1	-8.1	19.3
15	37.4	163.1	127.3	34.1	248.6	7.7	-15.0	11.6
16	66.7	291.0	144.1	64.0	357.8	11.6	-22.7	19.1
17	51.8	225.7	748.7	48.2	869.4	56.8	30.2	26.5
18	44.6	194.7	5219.0	51.6	5343.4	18.0	17.4	.0
19	28.0	122.2	1117.5	26.9	1199.3	13.5	-1.5	10.2
20	38.8	168.9	248.6	36.1	362.1	19.3	-3.1	12.8
21	59.6	260.1	357.8	58.8	474.5	81.8	56.7	23.8
22	16.9	73.8	.0	14.6	54.3	4.9	3.0	.0
23	40.3	175.8	.0	34.4	121.3	20.1	5.4	5.3
24	55.3	241.1	5343.4	63.9	5506.0	14.0	3.5	.0
25	39.3	171.3	1199.3	37.3	1276.6	56.8	29.9	20.1
26	72.2	314.6	416.4	67.0	571.6	92.4	41.5	39.6
27	54.7	238.3	121.3	51.2	296.9	11.5	-21.2	27.9
TOTAL	2512.4	12083.4	28468.4	2422.3	37463.2	587.3	270.5	216.2

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1991
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	4138.7	.0	914.9	3268.9	.0	.0	.0
2	5.2	15.3	.0	3.4	11.8	.0	.0	.0
3	160.4	515.0	.0	107.4	407.4	.3	.0	.0
4	66.5	213.6	.0	44.5	169.0	.1	.0	.0
5	59.0	172.2	407.4	45.5	519.6	14.5	15.2	.0
6	20.1	58.8	.0	14.4	32.4	11.9	12.0	.0
7	111.1	324.3	169.0	81.7	368.7	43.0	44.1	.0
8	48.4	141.2	3268.9	54.2	3342.7	13.6	13.7	.0
9	56.5	165.0	531.4	41.5	642.6	12.3	12.6	.0
10	41.3	120.6	.0	29.0	80.6	11.0	11.4	.0
11	28.8	83.9	32.4	20.5	89.7	6.2	6.3	.0
12	48.8	142.5	368.7	36.9	472.2	2.0	2.1	.1
13	41.3	120.5	3342.7	46.3	3408.3	9.0	9.2	.0
14	37.8	110.3	642.6	28.2	713.6	11.2	-15.7	27.6
15	37.4	109.2	80.6	26.4	157.5	5.9	-10.7	17.3
16	66.7	194.8	89.7	52.1	223.4	10.0	-16.2	28.6
17	51.8	151.1	472.2	37.7	543.7	42.0	4.3	37.8
18	44.6	130.3	3408.3	50.1	3474.7	14.2	14.2	.0
19	28.0	81.8	713.6	21.2	764.4	9.7	-2.5	15.0
20	38.8	113.1	157.5	28.3	227.3	15.0	-2.3	18.9
21	59.6	174.1	223.4	48.3	288.0	62.7	28.8	34.7
22	16.9	49.4	.0	11.4	34.8	3.3	3.3	.0
23	40.3	117.7	.0	26.7	77.4	13.6	7.5	8.4
24	55.3	161.4	3474.7	60.8	3565.8	9.9	9.5	.0
25	39.3	114.7	764.4	29.4	808.0	41.8	15.3	28.7
26	72.2	210.6	262.1	52.4	350.8	69.5	18.3	56.2
27	54.7	159.5	77.4	39.5	188.5	8.9	-27.5	39.9
TOTAL	2512.4	8089.8	18487.1	1952.8	24231.8	441.5	152.7	313.1

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1992
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	2380.6	.0	791.8	1631.2	.0	.0	.0
2	5.2	8.8	.0	2.8	5.9	.0	.0	.0
3	160.4	296.2	.0	89.9	206.1	.3	.0	.0
4	66.5	122.9	.0	37.3	85.6	.1	.0	.0
5	59.0	99.0	206.1	40.0	253.6	11.6	12.4	.0
6	20.1	33.8	.0	12.4	13.0	8.4	8.5	.0
7	111.1	186.5	85.6	71.1	166.2	34.9	35.8	.0
8	48.4	81.2	1631.2	51.6	1652.2	9.1	9.3	.0
9	56.5	94.9	259.5	36.7	307.8	10.0	10.5	.0
10	41.3	69.4	.0	25.4	36.8	7.2	7.8	.0
11	28.8	48.3	13.0	17.7	38.8	4.8	4.9	.0
12	48.8	82.0	166.2	32.3	214.3	1.6	1.7	.1
13	41.3	69.3	1652.2	44.1	1671.4	6.4	6.7	.0
14	37.8	63.5	307.8	25.0	337.9	8.3	-15.4	30.7
15	37.4	62.8	36.8	23.1	71.8	4.7	-7.2	18.8
16	66.7	112.1	38.8	44.7	99.1	7.7	-12.1	31.0
17	51.8	86.9	214.3	33.0	241.5	26.7	-15.3	42.0
18	44.6	75.0	1671.4	47.6	1688.7	10.4	10.6	.0
19	28.0	47.0	337.9	18.7	359.5	6.8	-3.3	16.4
20	38.8	65.1	71.8	24.3	100.8	11.7	-2.3	20.6
21	59.6	100.1	99.1	41.7	116.5	42.3	4.9	38.1
22	16.9	28.4	.0	9.4	17.1	1.9	3.2	.0
23	40.3	67.7	.0	22.0	37.1	8.6	6.4	8.8
24	55.3	92.9	1688.7	57.2	1718.8	6.0	7.8	.0
25	39.3	66.0	359.5	25.7	370.7	29.1	1.2	31.9
26	72.2	121.1	117.9	44.9	142.9	51.2	-2.9	62.8
27	54.7	91.8	37.1	34.7	86.7	7.5	-33.6	44.4
TOTAL	2512.4	4653.2	8994.7	1705.1	11671.7	317.1	39.8	345.5

HYDROLOGIC BALANCE OF JHAPA DISTRICT BASIN (CASE 1)

YEAR OF 1993
UNIT = M.C.M.

BASIN NO.	AREA (SQ.KM)	RAIN-FALL	SURFACE INFLOW	EVAPO-TRANSPN	SURFACE OUTFLOW	GROUNDWATER RECHARGE	GROUNDWATER OUTFLOW	DRAFT
1	1181.5	3408.5	.0	985.3	2379.0	.0	.0	.0
2	5.2	12.6	.0	3.8	8.8	.0	.0	.0
3	160.4	424.1	.0	117.9	305.8	.3	.0	.0
4	66.5	175.9	.0	48.9	127.0	.1	.0	.0
5	59.0	141.8	305.8	49.3	384.1	14.2	13.9	.0
6	20.1	48.4	.0	15.6	21.5	11.3	11.1	.0
7	111.1	267.1	127.0	88.6	262.7	42.7	41.3	.0
8	48.4	116.3	2379.0	52.7	2430.9	11.2	11.0	.0
9	56.5	135.9	392.9	45.0	472.4	11.4	10.9	.0
10	41.3	99.3	.0	31.5	57.8	10.0	9.5	.0
11	28.8	69.1	21.5	22.1	62.6	5.9	5.8	.0
12	48.8	117.3	262.7	39.9	338.2	1.9	1.6	.1
13	41.3	99.3	2430.9	45.0	2477.2	7.6	7.5	.0
14	37.8	90.9	472.4	30.3	522.9	10.0	-17.5	22.6
15	37.4	89.9	57.8	28.7	113.2	5.8	-9.2	13.6
16	66.7	160.4	62.6	54.2	158.6	9.0	-16.3	22.3
17	51.8	124.4	338.2	40.8	385.7	36.1	5.0	31.0
18	44.6	107.3	2477.2	48.7	2523.3	12.2	12.2	.0
19	28.0	67.4	522.9	22.7	559.0	8.5	-5.7	11.9
20	38.8	93.2	113.2	30.5	160.9	14.9	-2.8	14.9
21	59.6	143.4	158.6	49.7	196.2	54.1	25.3	27.8
22	16.9	40.7	.0	12.4	25.3	3.0	3.0	.0
23	40.3	96.9	.0	29.0	55.8	12.1	4.3	6.2
24	55.3	132.9	2523.3	59.3	2588.8	7.8	6.6	.0
25	39.3	94.5	559.0	31.6	583.4	38.5	10.4	23.5
26	72.2	173.5	186.2	56.4	236.5	66.7	9.5	46.5
27	54.7	131.4	55.8	42.9	135.5	8.8	-28.8	32.7
TOTAL	2512.4	6662.5	13447.2	2083.1	17573.4	404.1	108.5	253.0

4.6 Project Cost

JHAPA DISTRICT PRIORITY SUB-AREA (150 ha/D.T.W Q = 120ℓ/s)

Summary of Project Cost Estimate

TABLE 4.6.1 (Unit: 1,000 NRs)

No.	Work Items	Cost L/C	Cost F/C	Cost Total	Remarks
1	Well Development	219	1,297	1,516	T.A = 17,000 ha L/C; Local Currency F/C; Foreign Currency
2	Pump Station	1,076	2,886	3,962	
3	Irrigation Canal System	1,295	948	2,243	
4	Drainage System	380	87	467	
5	Farm Road System	1,535	1,023	2,558	
6	Land Acquisition	2,100	-	2,100	
	Total (1-6)	6,605	6,241	12,846	Cost of One D.T.W Area
7	Whole Area Cost	746,365	705,233	1,451,598	No of D.T.W: 113
8	Building for O & M	7,527	3,980	11,507	
9	Procurement of O&M and Office Equipment	2,940	52,170	55,110	
10	Technical Support	108,030	304,530	412,560	
11	Project Administration	107,730		107,730	
12	Total Investment Cost	972,592	1,065,913	2,038,505	(7 - 11)
	US Dollar Equivalent	19,452	21,318	40,770	(×1,000)
	Per (ha)	1,144	1,254	2,398	≒ 2,400 US$/ha
13	Physical Contingencies	97,259	106,591	203,850	(12 × 0.10)
14	Price Escalation	486,296	159,887	646,183	
15	Total Project Cost	1,556,147	1,332,391	2,888,538	
	US Dollar Equivalent	31,123	26,648	57,771	(× 1,000)

MAHOTTARI DISTRICT PRIORITY SUB-AREA A_1 (66 ha/D.T.W Q = 66 ℓ/s)
A_2 (97 ha/D.T.W Q = 97 ℓ/s)

Summary of Project Cost Estimate

TABLE 4.6.2 (Unit: 1,000 NRs)

No.	Work Items		Cost L/C	Cost F/C	Cost Total	Remarks
1	Well Development	A_1	219	1,297	1,516	T.A= 7,000 ha
	Well Development	A_2	219	1,297	1,516	L/C; Local Currency F/C; Foreign Currency
2	Pump Station	A_1	697	1,625	2,322	A_1; 4,000 ha
	Pump Station	A_2	864	2,250	3,114	A_2; 3,000 ha
3	Irrigation Canal System	A_1	604	442	1,046	
	Irrigation Canal System	A_2	837	613	1,450	
4	Drainage System	A_1	177	41	218	
	Drainage System	A_2	245	56	301	
5	Farm Road System	A_1	716	477	1,193	
	Farm Road System	A_2	992	662	1,654	
6	Land Acquisition	A_1	990	-	990	
	Land Acquisition	A_2	1,380	-	1,380	
	Total A_1 (1-6)		3,403	3,882	7,285	Cost of One D.T.W Area
	Total A_2 (1-6)		4,537	4,878	9,415	Cost of One D.T.W Area
7	Whole Area Cost	A_1	207,583	236,802	444,385	No of D.T.W: 61
		A_2	140,647	151,218	291,865	No of D.T.W: 31
	Total (A_1 + A_2)		348,230	388,020	736,250	
8	Building for O & M		5,018	2,653	7,671	
9	Procurement of O&M and Office Equipment		1,960	34,780	36,740	
10	Technical Support		72,020	203,020	275,040	
11	Project Administration		71,820	-	71,820	
12	Total Investment Cost		499,048	628,473	1,127,521	(7 - 11)
	US Dollar Equivalent		9,981	12,569	22,550	(×1,000)
	Per (ha)		1,426	1,796	3,222	≒ 3,200 US$/ha
13	Physical Contingencies		49,905	62,847	112,752	(12 × 0.10)
14	Price Escalation		249,524	94,271	343,795	
15	Total Project Cost		798,447	785,591	1,584,068	
	US Dollar Equivalent		15,970	15,712	31,682	(× 1,000)

BANKE-BARDIYA DISTRICT PRIORITY SUB-AREA (157 ha/D.T.W Q = 110ℓ/s)

Summary of Project Cost Estimate

TABLE 4.6.3 (Unit: 1,000 NRs)

No.	Work Items	Cost L/C	Cost F/C	Cost Total	Remarks
1	Well Development	219	1,297	1,516	T.A = 8,000 ha L/C; Local Currency F/C; Foreign Currency
2	Pump Station	1,072	2,776	3,848	
3	Irrigation Canal System	1,381	1,011	2,392	
4	Drainage System	405	93	498	
5	Farm Road System	1,637	1,091	2,728	
6	Land Acquisition	2,250	-	2,250	
	Total (1-6)	6,964	6,268	13,232	Cost of One D.T.W Area
7	Whole Area Cost	355,164	319,668	674,832	No of D.T.W: 51
8	Building for O & M	5,018	2,653	7,671	
9	Procurement of O&M and Office Equipment	1,960	34,780	36,740	
10	Technical Support	72,020	203,020	275,040	
11	Project Administration	71,820	-	71,820	
12	Total Investment Cost	505,982	560,121	1,066,103	
	US Dollar Equivalent	10,120	11,202	21,322	(×1,000)
	Per (ha)	1,265	1,400	2,665	≒ 2,700 US$/ha
13	Physical Contingencies	50,598	56,012	106,610	(12 × 0.10)
14	Price Escalation	252,991	84,018	337,009	
15	Total Project Cost	809,571	700,151	1,509,722	
	US Dollar Equivalent	16,191	14,003	30,194	(× 1,000)

4.7 Project Evaluation

Table 4.7.1 Standard Conversion Factor

(Million Rs)

Item	1986/87	1987/88	1988/89	1989/90	1990/91	Average
(1) Total Amount of Import (CIF Price)	10927.1	13893.8	16296.8	18355.7	23255.7	16545.8
(2) Total Amount of Export (FOB Price)	3003.0	4128.0	4211.1	5169.5	7403.3	4783.0
(3) Total Amount of Import Duty	1285.3	1984.2	2133.9	2646.0	2752.7	2160.4
(4) Total Amount of Export Duty	79.4	107.9	62.7	32.6	78.5	72.2
(5) Total Amount of Subsidy for Export	0	0	0	0	0	0
(6) = (1) + (2)	13930.1	18021.8	20507.9	23525.2	30659.0	21328.8
(7) = (1) + (2) + (3) - (4) + (5)	15136.0	19898.1	22579.1	26138.6	33333.2	23417.0
(8) SCF = (6) ÷ (7)	0.920	0.906	0.908	0.900	0.920	0.911

Source: Statistical Yearbook of Nepal, 1993

Table 4.7.2 Economic Farmgate Prices of Trade Crops

	Unit	Wheat	Maize	Paddy
Forecasted prices in 2005. 1990 constant dollars	US$/ton	137	87	251
Prices forecast in 1993 constant dollars	US$/ton	147	93	269
Adjustment of quality	%	95	95	90
Forecasted price after quality adjustment	US$/ton	140	88	242
Shipping & handling	US$/ton	73	70	40
CIF/FOB Calcutta price	US$/ton	213	158	282
Transportation & handling to Nepal border				
Jhapa	US$/ton	35	35	35
Mohottari	US$/ton	43	43	43
Banke	US$/ton	50	50	50
Nepal border price				
Jhapa	Rs/ton	12152	9457	15533
Mohottari	Rs/ton	12544	9849	15925
Banke	Rs/ton	12889	10192	16268
Conversion coefficient	%	100	100	65
Processing cost	Rs/ton	0	0	200
By-product	Rs/ton	260	210	310
Commodity price				
Jhapa	Rs/ton	12412	9667	10206
Mohottari	Rs/ton	12804	10059	10461
Banke	Rs/ton	13149	10402	10684
Transportation & handling to farmgate	Rs/ton	100	100	100
Farm-gate price				
Jhapa	Rs/ton	12312	9567	10106
Mohottari	Rs/ton	12704	9959	10361
Banke	Rs/ton	13049	10302	10584

Table 4.7.3 Economic Farmgate Prices of Fertilizers

	Unit	Urea	TSP	Muriate of Potash
Forecasted price in 2005,1990 constant dollars	US$/ton	140	121	103
Price forecast in 1993 constant price	US$/ton	150	130	110
Shipping & handling	US$/ton	65	70	70
CIF/FOB price at Culcatta Port	US$/ton	215	200	180
Transportation & handling to Nepal border				
Jhapa	US$/ton	30	30	30
Mahottari	US$/ton	38	38	38
Banke	US$/ton	47	47	47
Nepal border price				
Jhapa	Rs/ton	12007	11254	10309
Mahottari	Rs/ton	12399	11646	10701
Banke	Rs/ton	12840	12087	11142
Transportation to farmgate	Rs/ton	100	100	100
Percent of constituent	%	(N)46	(P)46	(k)60
Farmgate price				
Jhapa	Rs/ton	26319	24683	17348
Mahottari	Rs/ton	27171	25535	18001
Banke	Rs/ton	27913	26276	18570

Table 4.7.4 Farmgate Prices (Jhapa)

	Unit	Price		Remarks
		Financial	Economic	
1. Seeds				
Paddy	Rs/kg	10.00	10.61	
Wheat	Rs/kg	11.65	23.90	
Maize	Rs/kg	14.20	25.12	
Mustard	Rs/kg	23.00	21.95	
Pigeon Peas	Rs/kg	16.00	14.58	
Lentil	Rs/kg	18.00	16.40	
Cauliflower	Rs/kg	300.00	273.30	
Potato	Rs/kg	10.00	9.11	
Onion	Rs/kg	225.00	204.97	
Vegetables (cabbage)	Rs/kg	305.00	277.86	
2. Crops				
Paddy	Rs/ton	4790	10106	
Wheat	Rs/ton	4250	12312	
Maize	Rs/ton	4590	9567	
Mustard (oilseeds)	Rs/ton	23110	23110	
Pigeon Peas	Rs/ton	17190	17190	
Lentil	Rs/ton	14940	14940	
Cauliflower	Rs/ton	7690	7690	
Potato	Rs/ton	3880	3880	
Onion	Rs/ton	8940	8940	
Vegetables (cabbage)	Rs/ton	6740	6740	
3. By-products				
Paddy Straw	Rs/kg	0.40	0.36	
Wheat Straw	Rs/kg	0.25	0.23	
Maize Stalks	Rs/kg	0.20	0.18	
Lentil Stalks	Rs/kg	0.25	0.23	
Mustard Stalks	Rs/kg	0.20	0.18	
4. Fertilizer				
Nitrogen	Rs/kg	12.17	26.32	
Phosphate	Rs/kg	17.39	24.68	
Potash	Rs/kg	14.17	17.35	
Barnyard Manure	Rs/ton	200.00	182.00	
5. Agri-Chemicals				
Parathion	Rs/kg	338.5	308.4	
BHC Dust	Rs/kg	5.9	5.4	
Malathion Dust	Rs/kg	12.6	11.5	
Hinosan	Rs/lit.	463.0	421.8	
2-4D	Rs/kg	203.8	185.7	
6. Farm Labor				
Hired Labor	Rs/day	32	22	
Hired Bullock with Labour	Rs/day	100	68	

Table 4.7.5 Farmgate Prices (Mahottari)

	Unit	Price		Remarks
		Financial	Economic	
1. Seeds				
Paddy	Rs/kg	8.50	9.01	
Wheat	Rs/kg	10.50	21.50	
Maize	Rs/kg	15.00	26.51	
Mustard	Rs/kg	22.00	20.04	
Pigeon Peas	Rs/kg	16.00	14.58	
Lentil	Rs/kg	18.00	16.39	
Cauliflower	Rs/kg	300.00	273.30	
Potato	Rs/kg	8.00	7.29	
Onion	Rs/kg	225.00	204.97	
Vegetables (cabbage)	Rs/kg	300.00	273.30	
2. Crops				
Paddy	Rs/ton	6070	10361	
Wheat	Rs/ton	6010	12704	
Maize	Rs/ton	4920	9959	
Mustard (oilseeds)	Rs/ton	23480	23480	
Pigeon Peas	Rs/ton	15420	15420	
Lentil	Rs/ton	14940	14940	
Cauliflower	Rs/ton	6000	6000	
Potato	Rs/ton	4530	4530	
Onion	Rs/ton	4140	4140	
Vegetables (cabbage)	Rs/ton	3430	3430	
3. By-products				
Paddy Straw	Rs/kg	0.50	0.46	
Wheat Straw	Rs/kg	0.30	0.27	
Maize Stalks	Rs/kg	0.20	0.18	
Lentil Stalks	Rs/kg	0.25	0.23	
Mustard Stalks	Rs/kg	0.20	0.18	
4. Fertilizer				
Nitrogen	Rs/kg	11.22	27.17	
Phosphate	Rs/kg	17.39	25.35	
Potash	Rs/kg	13.58	18.00	
Barnyard Manure	Rs/ton	200.00	182.00	
5. Agri-Chemicals				
Parathion	Rs/kg	338.5	308.4	
BHC Dust	Rs/kg	5.9	5.4	
Malathion Dust	Rs/kg	12.6	11.5	
Hinosan	Rs/lit.	463.0	421.8	
2-4D	Rs/kg	203.8	185.7	
6. Farm Labor				
Hired Labor	Rs/day	35	24	
Hired Bullock with Labour	Rs/day	100	68	

Table 4.7.6 **Farmgate Prices (Banke)**

	Unit	Price		Remarks
		Financial	Economic	
1. Seeds				
Paddy	Rs/kg	9.05	9.59	
Wheat	Rs/kg	11.65	23.90	
Maize	Rs/kg	14.90	26.37	
Mustard	Rs/kg	30.00	27.33	
Pigeon Peas	Rs/kg	20.00	18.22	
Lentil	Rs/kg	18.50	16.85	
Cauliflower	Rs/kg	550.00	501.05	
Potato	Rs/kg	8.00	7.29	
Onion	Rs/kg	225.00	204.97	
Vegetables(cabbage)	Rs/kg	340.00	309.74	
2. Crops				
Paddy	Rs/ton	5270	10584	
Wheat	Rs/ton	6310	13049	
Maize	Rs/ton	5570	10302	
Mustard(oilseeds)	Rs/ton	20330	20330	
Pigeon Peas	Rs/ton	24230	24230	
Lentil	Rs/ton	21600	21600	
Cauliflower	Rs/ton	7000	7000	
Potato	Rs/ton	3600	3600	
Onion	Rs/ton	8940	8940	
Vegetables(cabbage)	Rs/ton	12060	12060	
3. By-products				
Paddy Straw	Rs/kg	0.50	0.46	
Wheat Straw	Rs/kg	0.25	0.23	
Maize Stalks	Rs/kg	0.25	0.23	
Lentil Stalks	Rs/kg	0.25	0.23	
Mustard Stalks	Rs/kg	0.20	0.18	
4. Fertilizer				
Nitrogen	Rs/kg	12.17	27.91	
Phosphate	Rs/kg	18.08	26.28	
Potash	Rs/kg	14.16	18.57	
Barnyard Manure	Rs/ton	200.00	182.00	
5. Agri-Chemicals				
Parathion	Rs/kg	338.5	308.4	
BHC Dust	Rs/kg	5.9	5.4	
Malathion Dust	Rs/kg	12.6	11.5	
Hinosan	Rs/lit.	463.0	421.8	
2-4D	Rs/kg	203.8	185.7	
6. Farm Labor				
Hired Labor	Rs/day	37	25	
Hired Bullock with Labour	Rs/day	100	68	

Table 4.7.7 Incremental Agricultural Benefit (Jhapa)

	M. Paddy Rainfed	M. Paddy Irrigated	S. Paddy Irrigated	Maize	Wheat	Miscellaneous (Mustard)	Total
Without Project							
Yield (ton/ha)	2.33	-	-	1.31	1.59	-	
Price (Rs/ton)	10,106	-	-	9,567	12,312	-	
GPV (RS/ha)	24,321	-	-	12,815	19,951	-	
Production Cost (Rs/ha)	8,935	-	-	7,368	10,588	-	
NPV (Rs/ha)	15,386	-	-	5,447	9,363	-	
Cropping Area (ha)	15,300	-	-	1,700	4,420	-	21,420
Total NPV (RS1000)	235,406	-	-	9,260	41,384	-	286,050
With Project							
Yield (ton/ha)	-	4.00	3.80	2.70	2.70	0.80	
Price (Rs/ton)	-	10,106	10,106	9,567	12,312	23,110	
GPV (RS/ha)	-	42,152	39,987	26,412	33,880	18,673	
Production Cost (Rs/ha)	-	12,839	10,276	11,168	12,895	9,055	
NPV (Rs/ha)	-	29,313	29,711	15,244	20,985	9,618	
Cropping Area (ha)	-	17,000	6,800	2,550	5,100	2,550	34,000
Total NPV (RS1000)	-	498,321	202,035	38,872	107,024	24,526	870,777
Incremental NPV (Rs1000)	-235,406	498,321	202,035	29,612	65,639	24,526	584,727

Note: GVP includes income from by-products

Table 4.7.8 Incremental Agricultural Benefit (Mahottari)

	M. Paddy Rainfed	M. Paddy Irrigated	S. Paddy Irrigated	Wheat	Pulses (Lentil)	Onion	Potato	Others (Oilseeds)	Total
Without Project									
Yield (ton/ha)	2.29	-	-	1.48	0.60	-	-	0.54	
Price (Rs/ton)	10,361	-	-	12,704	14,940	-	-	23,480	
GPV (RS/ha)	24,733	-	-	19,212	9,086	-	-	12,805	
Production Cost (Rs/ha)	9,338	-	-	11,479	3,673	-	-	6,483	
NPV (Rs/ha)	15,395	-	-	7,733	5,413	-	-	6,322	
Cropping Area (ha)	6,300	-	-	1,400	1,400	-	-	700	9,800
Total NPV (RS1000)	96,989	-	-	10,826	7,578	-	-	4,425	119,818
With Project									
Yield (ton/ha)	-	3.40	3.60	2.60	-	13.00	12.00	-	
Price (Rs/ton)	-	10,361	10,361	12,704	-	4,140	4,530	-	
GPV (RS/ha)	-	36,837	38,983	33,751	-	53,820	54,360	-	
Production Cost (Rs/ha)	-	12,697	10,584	13,583	-	26,899	35,598	-	
NPV (Rs/ha)	-	24,140	28,399	20,168	-	26,921	18,762	-	
Cropping Area (ha)	-	7,000	700	3,430	-	1,330	1,540	-	14,000
Total NPV (RS1000)	-	168,980	19,879	69,176	-	35,805	28,893	-	322,734
Incremental NPV (Rs1000)	-96,989	168,980	19,879	58,350	-7,578	35,805	28,893	-4,425	202,916

Table 4.7.9 Incremental Agricultural Benefit (Banke)

	M. Paddy Rainfed	M. Paddy Irrigated	Maize	Mustard	Wheat	Pulses (Lentil)	Potato	Others (Cauliflower)	Total
Without Project									
Yield (ton/ha)	1.95	-	1.61	0.55	1.40	0.68	-	-	
Price (Rs/ton)	10,584	-	10,302	20,330	13,049	21,600	-	-	
GPV (RS/ha)	21,552	-	17,030	11,309	18,598	14,826	-	-	
Production Cost (Rs/ha)	9,618	-	8,626	6,593	10,575	3,763	-	-	
NPV (Rs/ha)	11,934	-	8,404	4,716	8,023	11,063	-	-	
Cropping Area (ha)	6,400	-	800	800	2,400	800	-	-	11,200
Total NPV (RS1000)	76,378	-	6,723	3,773	19,255	8,850	-	-	114,979
With Project									
Yield (ton/ha)	-	3.50	2.60	0.80	2.10	1.00	14.00	11.00	
Price (Rs/ton)	-	10,584	10,302	20,330	13,049	21,600	3,600	7,000	
GPV (RS/ha)	-	38,608	27,498	16,417	27,897	21,807	50,400	77,000	
Production Cost (Rs/ha)	-	13,428	13,058	10,680	13,491	6,058	22,546	19,934	
NPV (Rs/ha)	-	25,180	14,440	5,737	14,406	15,749	27,854	57,066	
Cropping Area (ha)	-	6,960	1,200	1,040	4,000	1,360	1,200	240	16,000
Total NPV (RS1000)	-	175,253	17,328	5,966	57,624	21,419	33,425	13,696	324,711
Incremental NPV (Rs1000)	-76,378	175,253	10,605	2,194	38,369	12,568	33,425	13,696	209,731

Note: GVP includes income from by-products

Table 4.7.10 Cost and Return of Crops(Economic)-Jhapa

District:Jhapa
Crop:Rainfed Paddy-Monsoon

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	22	172	3784	185	4070
Bullock Labor	day	68	41	2788	44	2992
Sub-total				6572		7062
b.Input Cost						
Seed	kg	10.61	62	658	62	658
Manure	kg	0.18	900	162	900	162
Fertilizer						
N	kg	26.32	30	790	40	1053
P	kg	24.68	10	247	20	494
K	kg	17.35	0	0	15	260
Agri-Chemicals	kg		0	60		150
Sub-total				1916		2776
Miscellaneous(5% of total)				447		518
Total Costs				8935		10356
2. Gross Income				24321		36559
a. Main Product	ton	10106	2.33	23547	3.50	35371
b. By-product	ton	360	2.15	774	3.30	1188
3. Net Profit	Rs			15386		26203

District:Jhapa
Crop:Irrigated Paddy(HYV)-Monsson

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	22	179	3938	197	4334
Bullock Labor		68	43	2924	49	3332
Sub-total				6862		7666
b.Input Cost						
Seed	kg	10.61	56	594	56	594
Manure	ton	0.18	1650	297	1650	297
Fertilizer						
N	kg	26.32	46	1211	80	2106
P	kg	24.68	15	370	40	987
K	kg	17.35	10	174	20	347
Agri-Chemicals	kg		0	75		200
Sub-total				2721		4531
Miscellaneous(5% of total)				504		642
Total Costs				10087		12839
2. Gross Income				27781		42152
a. Main Product	ton	10106	2.64	26629	4.00	40424
b. By-product	ton	360	3.20	1152	4.80	1728
3. Net Profit	Rs			17694		29313

District:Jhapa
Crop:Irrigated Paddy(HYV)-Spring Paddy

	Unit	Unit Price (Rs)	Without Project Quant-ity	Value (Rs)	With Project Quant-ity	Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	22	100	2200	114	2508
Bullock Labor	day	68	42	2856	47	3196
Sub-total				5056		5704
b.Input Cost						
Seed	kg	10.61	69	732	69	732
Manure	kg	0.18	1090	196	1090	196
Fertilizer						
N	kg	26.32	40	1053	70	1842
P	kg	24.68	15	370	30	740
K	kg	17.35	10	174	20	347
Agri-Chemicals	kg		0	75		200
Sub-total				2600		4058
Miscellaneous(5% of total)				403		514
Total Costs				8059		10276
2. Gross Income				14847		39987
a. Main Product	ton	10106	1.41	14199	3.80	38403
b. By-product	ton	360	1.80	648	4.40	1584
3. Net Profit	Rs			6788		29711

District:Jhapa
Crop:Maize

	Unit	Unit Price (Rs)	Without Project Quant-ity	Valuc (Rs)	With Project Quant-ity	Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	22	133	2926	160	3511
Bullock Labor		68	29	1972	34	2312
Sub-total				4898		5823
b.Input Cost						
Seed	kg	25.12	25	628	25	628
Manure	kg	0.18	2880	518	2880	518
Fertilizer						
N	kg	26.32	25	658	80	2106
P	kg	24.68	10	247	40	987
K	kg	17.35	0	0	20	347
Agri-Chemicals	kg			50		200
Sub-total				2101		4786
Miscellaneous(5% of total)				368		558
Total Costs				7368		11168
2. Gross Income				12815		26412
a. Main Product	kg	9567	1.31	12533	2.70	25831
b. By-product	kg	180	1.57	283	3.23	581
3. Net Profit	Rs			5448		15245

District:Jhapa
Crop:Wheat

	Unit	Unit Price (Rs)	Without Project		With Project	
			Quant-ity	Value (Rs)	Quant-ity	Value (Rs)
1. Production Cost						
a. Labor Cost						
Labor	day	22	119	2618	140	3080
Bullock Labor	day	68	40	2720	47	3196
Sub-total				5338		6276
b. Input Cost						
Seed	kg	23.9	120	2868	120	2868
Manure	kg	0.18	1700	306	1700	306
Fertilizer						
N	kg	26.32	40	1053	50	1316
P	kg	24.68	18	444	40	987
K	kg	17.35	0	0	20	347
Agri-Chemicals	kg		0	50		150
Sub-total				4721		5974
Miscellaneous(5% of total)				529		645
Total Costs				10588		12895
2. Gross Income				19951		33880
a. Main Product	ton	12312	1.59	19576	2.70	33242
b. By-product	ton	230	1.63	375	2.77	637
3. Net Profit	Rs			9363		20985

District:Jhapa
Crop:Lentil & Pulses

	Unit	Unit Price (Rs)	Without Project		With Project	
			Quant-ity	Value (Rs)	Quant-ity	Value (Rs)
1. Production Cost						
a. Labor Cost						
Labor	day	22	72	1584	83	1826
Bullock Labor		68	11	748	13	898
Sub-total				2332	0	2724
b. Input Cost						
Seed	kg	16.4	22	361	22	361
Manure	kg	0.18	300	54	300	54
Fertilizer						
N	kg	26.32	15	395	25	658
P	kg	24.68	20	494	40	987
K	kg	17.35	0	0	0	0
Agri-Chemicals	kg		0	0		65
Sub-total				1303		2125
Miscellaneous(5% of total)				191		255
Total Costs				3827		5104
2. Gross Income				9086		16657
a. Main Product	ton	14940	0.60	8964	1.10	16434
b. By-product	ton	230	0.53	122	0.97	223
3. Net Profit	Rs			5259		11553

District:Jhapa
Crop:Mustard(Oilcrops)

	Unit	Unit Price (Rs)	Without Project Quant-ity	Value (Rs)	With Project Quant-ity	Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	22	83	1826	98	2156
Bullock Labor		68	34	2312	38	2584
Sub-total				4138		4740
b.Input Cost						
Seed	kg	21.95	20	439	20	439
Manure	kg	0.18	2500	450	2500	450
Fertilizer						
N	kg	26.32	35	921	50	1316
P	kg	24.68	10	247	40	987
K	kg	17.35	0	0	30	521
Agri-Chemicals	kg		0	0		150
Sub-total				2057		3863
Miscellaneous(5% of total)				326		453
Total Costs				6521		9055
2. Gross Income				14239		18673
a. Main Product	ton	23110	0.61	14097	0.80	18488
b. By-product	ton	180	0.79	142	1.03	185
3. Net Profit	Rs			7718		9618

District:Jhapa
Crop:Potato

	Unit	Unit Price (Rs)	Without Project Quant-ity	Value (Rs)	With Project Quant-ity	Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	22	311	6842	338	7436
Bullock Labor		68	27	1836	31	2108
Sub-total				8678		9544
b.Input Cost						
Seed	kg	9.11	950	8655	950	8655
Manure	kg	0.18	11500	2070	11500	2070
Fertilizer						
N	kg	26.32	300	7896	330	8686
P	kg	24.68	100	2468	110	2715
K	kg	17.35	25	434	28	477
Agri-Chemicals	kg		0	150		300
Sub-total				21672		22902
Miscellaneous(5% of total)				1597		1708
Total Costs				31948		34154
2. Gross Income				35269		46560
a. Main Product	ton	3880	9.09	35269	12.00	46560
b. By-product	ton	0	0	0	0	0
3. Net Profit	Rs			3322		12406

District:Jhapa
Crop:Vegetables(Cauliflower)

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	22	345	7590	385	8470
Bullock Labor		68	25	1700	29	1972
Sub-total				9290		10442
b.Input Cost						
Seed	kg	273.3	0.5	137	0.5	137
Manure	kg	0.18	15000	2700	15000	2700
Fertilizer						
N	kg	26.32	50	1316	100	2632
P	kg	24.68	48	1185	80	1974
K	kg	17.35	25	434	50	868
Agri-Chemicals	kg			150		300
Sub-total				5921		8611
Miscellaneous(5% of total)				801		1003
Total Costs				16012		20055
2. Gross Income				47524		84590
a. Main Product	ton	7690	6.18	47524	11.00	84590
b. By-product	ton	0	0.30	0	0.50	0
3. Net Profit	Rs			31513		64535

Table 4.7.11 Cost and Return of Crops(Economic)-Mahottari

District:Mahottari
Crop:Rainfed Paddy-Monsoon

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	24	164	3936	175	4200
Bullock Labor	day	68	44	2992	47	3196
Sub-total				6928		7396
b.Input Cost						
Seed	kg	9.01	64	577	64	577
Manure	kg	0.18	900	162	900	162
Fertilizer						
N	kg	27.17	35	951	40	1087
P	kg	25.35	10	254	20	507
K	kg	18.00	0	0	15	270
Agri-Chemicals			0	0		200
Sub-total				1943		2802
Miscellaneous(5% of total)				467		537
Total Costs				9338		10735
2. Gross Income				24733		30322
a. Main Product	ton	10361	2.29	23675	2.80	29011
b. By-product	ton	460	2.30	1058	2.85	1311
3. Net Profit				15395		19587

District:Mahottari
Crop:Irrigated Paddy(HYV)-Monsson

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	24	159	3816	175	4200
Bullock Labor	day	68	41	2788	47	3196
Sub-total				6604		7396
b.Input Cost						
Seed	kg	9.01	60	541	60	541
Manure	kg	0.18	2100	378	2100	378
Fertilizer						
N	kg	27.17	62	1685	80	2174
P	kg	25.35	20	507	40	1014
K	kg	18.00	10	180	20	360
Agri-Chemicals			0	0		200
Sub-total				3290		4666
Miscellaneous(5% of total)				521		635
Total Costs				10415		12697
2. Gross Income				29231		36837
a. Main Product	ton	10361	2.70	28016	3.40	35227
b. By-product	ton	460	2.64	1214	3.50	1610
3. Net Profit				18816		24140

District:Mahottari
Crop:Irrigated Paddy(HYV)-Spring Paddy

	Unit	Unit Price (Rs)	Without Project Quant-ity	Value (Rs)	With Project Quant-ity	Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	24	100	2400	114	2736
Bullock Labor	day	68	42	2856	47	3196
Sub-total				5256		5932
b.Input Cost						
Seed	kg	9.01	60	541	60	541
Manure	kg	0.18	2000	360	2000	360
Fertilizer						
N	kg	27.17	50	1359	70	1902
P	kg	25.35	15	380	30	761
K	kg	18.00	10	180	20	360
Agri-Chemicals			0	0		200
Sub-total				2819		4123
Miscellaneous(5% of total)				425		529
Total Costs				8500		10584
2. Gross Income				32967		38983
a. Main Product	kg	10361	3.05	31601	3.60	37300
b. By-product	kg	460	2.97	1366	3.66	1684
3. Net Profit				24467		28399

District:Mahottari
Crop:Maize

	Unit	Unit Price (Rs)	Without Project Quant-ity	Value (Rs)	With Project Quant-ity	Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	24	125	3000	150	3600
Bullock Labor	day	68	32	2176	38	2611
Sub-total				5176		6211
b.Input Cost						
Seed	kg	26.51	28	742	28	742
Manure	kg	0.18	2100	378	2100	378
Fertilizer						
N	kg	27.17	60	1630	80	2174
P	kg	25.35	10	254	30	761
K	kg	18.00	0	0	20	360
Agri-Chemicals				25		200
Sub-total				3029		4614
Miscellaneous(5% of total)				432		570
Total Costs				8637		11395
2. Gross Income				19839		26469
a. Main Product	ton	9959	1.95	19420	2.60	25893
b. By-product	ton	180	2.33	419	3.20	576
3. Net Profit				11203		15074

District:Mahottari
Crop:Wheat

	Unit	Unit Price (Rs)	Without Project Quant-ity	Value (Rs)	With Project Quant-ity	Value (Rs)
1. Production Cost						
a. Labor Cost						
Labor	day	24	98	2352	116	2784
Bullock Labor	day	68	47	3196	55	3740
Sub-total				5548		6524
b. Input Cost						
Seed	kg	21.5	120	2580	120	2580
Manure	kg	0.18	1800	324	1800	324
Fertilizer						
N	kg	27.17	65	1766	70	1902
P	kg	25.35	20	507	40	1014
K	kg	18.00	10	180	20	360
Agri-Chemicals			0	0		200
Sub-total				5357		6380
Miscellaneous(5% of total)				574		679
Total Costs				11479		13583
2. Gross Income				19212		33751
a. Main Product	ton	12704	1.48	18802	2.60	33030
b. By-product	ton	270	1.52	410	2.67	721
3. Net Profit				7733		20168

District:Mahottari
Crop:Lentil & Pulses

	Unit	Unit Price (Rs)	Without Project Quant-ity	Value (Rs)	With Project Quant-ity	Value (Rs)
1. Production Cost						
a. Labor Cost						
Labor	day	24	60	1440	71	1704
Bullock Labor	day	68	12	816	12	816
Sub-total				2256		2520
b. Input Cost						
Seed	kg	16.39	35	574	35	574
Manure	kg	0.18	1200	216	1200	216
Fertilizer						
N	kg	27.17	7	190	25	679
P	kg	25.35	10	254	40	1014
K	kg	18.00	0	0	0	0
Agri-Chemicals	kg		0	0		200
Sub-total				1233		2683
Miscellaneous(5% of total)				184		274
Total Costs				3673		5477
2. Gross Income				9086		16657
a. Main Product	kg	14940	0.60	8964	1.10	16434
b. By-product	kg	230	0.53	122	0.97	223
3. Net Profit				5413		11180

District:Mahottari
Crop:Mustard(Oilcrops)

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	24	86	2064	112	2688
Bullock Labor	day	68	30	2040	35	2380
Sub-total				4104		5068
b.Input Cost						
Seed	kg	20.04	20	401	20	401
Manure	kg	0.18	2500	450	2500	450
Fertilizer						
N	kg	27.17	35	951	50	1359
P	kg	25.35	10	254	30	761
K	kg	18.00	0	0	30	540
Agri-Chemicals			0	0		200
Sub-total				2055		3710
Miscellaneous(5% of total)				324		462
Total Costs				6483		9240
2. Gross Income				12805		18969
a. Main Product	kg	23480	0.54	12679	0.80	18784
b. By-product	kg	180	0.70	126	1.03	185
3. Net Profit				6322		9730

District:Mahottari
Crop:Potato

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	24	316	7584	342	8208
Bullock Labor	day	68	42	2856	48	3264
Sub-total				10440		11472
b.Input Cost						
Seed	kg	7.29	990	7217	990	7217
Manure	kg	0.18	15100	2718	15100	2718
Fertilizer						
N	kg	27.17	300	8151	310	8423
P	kg	25.35	100	2535	110	2789
K	kg	18.00	50	900	50	900
Agri-Chemicals			0	0		300
Sub-total				21521		22346
Miscellaneous(5% of total)				1682		1780
Total Costs				33643		35598
2. Gross Income				45662		54360
a. Main Product	ton	4530	10.08	45662	12.00	54360
b. By-product	ton	0	0	0	0	0
3. Net Profit				12019		18762

District:Mahottari
Crop:Vegetables(Cauliflower)

	Unit	Unit Price (Rs)	Without Project		With Project	
			Quant-ity	Value (Rs)	Quant-ity	Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	24	330	7920	368	8832
Bullock Labor	day	68	23	1564	27	1836
Sub-total				9484		10668
b.Input Cost						
Seed	kg	273.3	0.5	137	0.5	137
Manure	kg	0.18	14500	2610	14500	2610
Fertilizer						
N	kg	27.17	50	1359	100	2717
P	kg	25.35	48	1217	80	2028
K	kg	18.00	25	450	50	900
Agri-Chemicals				300		500
Sub-total				6072		8892
Miscellaneous(5% of total)				819		1029
Total Costs				16375		20589
2. Gross Income				60000		72000
a. Main Product	ton	6000	10.00	60000	12.00	72000
b. By-product	ton	0	0.30	0	0.50	0
3. Net Profit				43625		51411

District:Mahottari
Crop:Onion

	Unit	Unit Price (Rs)	Without Project		With Project	
			Quant-ity	Value (Rs)	Quant-ity	Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	24	430	10320	480	11520
Bullock Labor	day	68	29	1972	29	1972
Sub-total				12292		13492
b.Input Cost						
Seed	kg	204.9	8.0	1640	8.0	1640
Manure	kg	0.18	30000	5400	30000	5400
Fertilizer						
N	kg	27.17	55	1494	66	1793
P	kg	25.35	45	1141	54	1369
K	kg	18.00	60	1080	70	1260
Agri-Chemicals				500		600
Sub-total				11255		12062
Miscellaneous(5% of total)				1239		1345
Total Costs				24786		26899
2. Gross Income				41400		53820
a. Main Product	ton	4140	10.00	41400	13.00	53820
b. By-product	ton	0	0.00	0	0.50	0
3. Net Profit				16614		26921

Table 4.7.12 Cost and Return of Crops(Economic)-Banke

District:Banke
Crop:Rainfed Paddy-Monsoon

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	25	156	3900	165	4125
Bullock Labor	day	68	44	2992	48	3264
Sub-total				6892		7389
b.Input Cost						
Seed	kg	9.59	65	623	65	623
Manure	kg	0.18	570	103	800	144
Fertilizer						
N	kg	27.91	45	1256	40	1116
P	kg	26.28	10	263	20	526
K	kg	18.57	0	0	15	279
Agri-Chemicals			0	0		200
Sub-total				2245		2888
Miscellaneous(5% of total)				481		541
Total Costs				9618		10818
2. Gross Income				21552		28806
a. Main Product	ton	10584	1.95	20586	2.60	27518
b. By-product	ton	460	2.10	966	2.80	1288
3. Net Profit				11934		17989

District:Banke
Crop:Irrigated Paddy(HYV)-Monsson

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	25	162	4050	179	4475
Bullock Labor	day	68	46	3128	55	3740
Sub-total				7178		8215
b.Input Cost						
Seed	kg	9.59	64	614	64	614
Manure	kg	0.18	400	72	400	72
Fertilizer						
N	kg	27.91	50	1396	80	2233
P	kg	26.28	15	394	40	1051
K	kg	18.57	10	186	20	371
Agri-Chemicals			0	0		200
Sub-total				2661		4541
Miscellaneous(5% of total)				518		671
Total Costs				10357		13428
2. Gross Income				23367		38608
a. Main Product	ton	10584	2.12	22438	3.50	37044
b. By-product	ton	460	2.02	929	3.40	1564
3. Net Profit				13010		25180

District:Banke
Crop:Irrigated Paddy(HYV)-Spring Paddy

	Unit	Unit Price (Rs)	Without Project		With Project	
			Quant-ity	Value (Rs)	Quant-ity	Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day					
Bullock Labor	day					
Sub-total						
b.Input Cost						
Seed	kg					
Manure	kg					
Fertilizer						
N	kg					
P	kg					
K	kg					
Agri-Chemicals						
Sub-total						
Miscellaneous(5% of total)						
Total Costs						
2. Gross Income						
a. Main Product	ton					
b. By-product	ton					
3. Net Profit						

District:Banke
Crop:Maize

	Unit	Unit Price (Rs)	Without Project		With Project	
			Quant-ity	Value (Rs)	Quant-ity	Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	25	132	3300	156	3900
Hired Labor	day	68	39	2652	46	3128
Sub-total				5952		7028
b.Input Cost						
Seed	kg	26.37	26	686	26	686
Manure	kg	0.18	5640	1015	5640	1015
Fertilizer						
N	kg	27.91	10	279	70	1954
P	kg	26.28	10	263	40	1051
K	kg	18.57	0	0	20	371
Agri-Chemicals				0		300
Sub-total				2243		5377
Miscellaneous(5% of total)				431		653
Total Costs				8626		13058
2. Gross Income				17030		27498
a. Main Product	ton	10302	1.61	16586	2.60	26785
b. By-product	ton	230	1.93	444	3.10	713
3. Net Profit				8404		14440

District:Banke
Crop:Wheat

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	25	120	3000	143	3575
Bullock Labor	day	68	39	2652	45	3060
Sub-total				5652		6635
b.Input Cost						
Seed	kg	23.9	125	2988	125	2988
Manure	kg	0.18	975	176	975	176
Fertilizer						
N	kg	27.91	30	837	50	1396
P	kg	26.28	15	394	40	1051
K	kg	18.57	0	0	20	371
Agri-Chemicals			0	0		200
Sub-total				4395		6181
Miscellaneous(5% of total)				529		675
Total Costs				10575		13491
2. Gross Income				18598		27897
a. Main Product	ton	13049	1.40	18269	2.10	27403
b. By-product	ton	230	1.43	329	2.15	495
3. Net Profit				8022		14407

District:Banke
Crop:Lentil & Pulses

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	25	75	1875	90	2250
Bullock Labor	day	68	14	952	16	1088
Sub-total				2827	0	3338
b.Input Cost						
Seed	kg	16.85	23	388	23	388
Manure	kg	0.18	450	81	450	81
Fertilizer						
N	kg	27.91	10	279	25	698
P	kg	26.28	0	0	40	1051
K	kg	18.57	0	0	0	0
Agri-Chemicals			0	0		200
Sub-total				748		2418
Miscellaneous(5% of total)				188		303
Total Costs				3763		6058
2. Gross Income				14826		21807
a. Main Product	ton	21600	0.68	14688	1.00	21600
b. By-product	ton	230	0.60	138	0.90	207
3. Net Profit				11063		15749

District:Banke
Crop:Mustard(Oilcrops)

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	25	110	2750	132	3300
Bullock Labor	day	68	30	2040	36	2448
Sub-total				4790		5748
b.Input Cost						
Seed	kg	27.33	20	547	20	547
Manure	kg	0.18	3600	648	3600	648
Fertilizer						
N	kg	27.91	10	279	50	1396
P	kg	26.28	0	0	40	1051
K	kg	18.57	0	0	30	557
Agri-Chemicals			0	0		200
Sub-total				1474		4398
Miscellaneous(5% of total)				330		534
Total Costs				6593		10680
2. Gross Income				11309		16417
a. Main Product	ton	20330	0.55	11182	0.80	16264
b. By-product	ton	180	0.71	128	0.85	153
3. Net Profit				4716		5737

District:Banke
Crop:Potato

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	25	367	9175	390	9750
Bullock Labor	day	68	50	3400	59	4012
Sub-total				12575		13762
b.Input Cost						
Seed	kg	7.29	560	4082	560	4082
Manure	kg	0.18	8000	1440	8000	1440
Fertilizer						
N	kg	27.91	40	1116	45	1256
P	kg	26.28	20	526	22	578
K	kg	18.57	0	0	0	0
Agri-Chemicals			0	0		300
Sub-total				7164		7657
Miscellaneous(5% of total)				1039		1127
Total Costs				20778		22546
2. Gross Income				43128		50400
a. Main Product	ton	3600	11.98	43128	14.00	50400
b. By-product	ton	0	0	0	0	0
3. Net Profit				22350		27854

District:Banke
Crop:Vegetables(Cauliflower)

	Unit	Unit Price (Rs)	Without Project Quant-ity	Value (Rs)	With Project Quant-ity	Value (Rs)
1. Production Cost						
a. Labor Cost						
Labor	day	25	320	8000	356	8900
Bullock Labor	day	68	25	1700	29	1972
Sub-total				9700		10872
b. Input Cost						
Seed	kg	501	0.5	251	0.5	251
Manure	kg	0.18	15000	2700	15000	2700
Fertilizer				0		
N	kg	27.91	50	1396	80	2233
P	kg	26.28	48	1261	70	1840
K	kg	18.57	25	464	40	743
Agri-Chemicals				500		300
Sub-total				6572		8066
Miscellaneous(5% of total)				856		997
Total Costs				17128		19934
2. Gross Income				62020		77000
a. Main Product	ton	7000	8.86	62020	11.00	77000
b. By-product	ton	0	0.50	0	0.80	0
3. Net Profit				44892		57066

Table 4.7.13 (1) Calculation of EIRR (Jhapa)

(Unit: Rs. Million)

Year	Project Cost				Project Benefit	Net Benefit	Present Worth Value			
	Initial Invest. Cost	Replace-ment Cost	O & M Cost	Total (1)	(2)	(2)-(1)	D. Rate= 0.10 Project Cost	Project Benefit	0.20 Net Benefit	0.21 Net Benefit
1	138	0	0	138	0	-138	125.5	0.0	-115.0	-114.0
2	166	0	0	166	0	-166	137.2	0.0	-115.3	-113.4
3	154	0	0	154	0	-154	115.7	0.0	-89.1	-86.9
4	116	0	0	116	0	-116	79.2	0.0	-55.9	-54.1
5	254	0	0	254	0	-254	157.7	0.0	-102.1	-97.9
6	256	0	10	266	257	-9	150.2	145.1	-3.0	-2.9
7	252	0	15	267	310	43	137.0	159.1	12.0	11.3
8	252	0	22	274	380	106	127.8	177.3	24.7	23.1
9	185	0	29	214	432	218	90.8	183.2	42.2	39.2
10	160	0	36	196	473	277	75.6	182.4	44.7	41.2
11	0	0	36	36	508	472	12.6	178.1	63.5	58.0
12	0	22	36	58	531	473	18.5	169.2	53.1	48.0
13	0	16	36	52	549	497	15.1	159.0	46.5	41.7
14	0	16	36	52	561	509	13.7	147.7	39.6	35.3
15	0	0	36	36	569	533	8.6	136.2	34.6	30.5
16	0	0	36	36	573	537	7.8	124.7	29.0	25.4
17	0	0	36	36	585	549	7.1	115.7	24.7	21.5
18	0	0	36	36	585	549	6.5	105.2	20.6	17.8
19	0	0	36	36	585	549	5.9	95.7	17.2	14.7
20	0	74	36	110	585	475	16.4	87.0	12.4	10.5
21	0	74	36	110	585	475	14.9	79.1	10.3	8.7
22	0	96	36	132	585	453	16.2	71.9	8.2	6.8
23	0	90	36	126	585	459	14.1	65.3	6.9	5.7
24	0	90	36	126	585	459	12.8	59.4	5.8	4.7
25	0	95	36	131	585	454	12.1	54.0	4.8	3.9
26	0	29	36	65	585	520	5.5	49.1	4.5	3.7
27	0	29	36	65	585	520	5.0	44.6	3.8	3.0
28	0	29	36	65	585	520	4.5	40.6	3.2	2.5
29	0	29	36	65	585	520	4.1	36.9	2.6	2.1
30	0	25	36	61	585	524	3.5	33.5	2.2	1.7
31	0	0	36	36	585	549	1.9	30.5	1.9	1.5
32	0	22	36	58	585	527	2.7	27.7	1.5	1.2
33	0	16	36	52	585	533	2.2	25.2	1.3	1.0
34	0	16	36	52	585	533	2.0	22.9	1.1	0.8
35	0	74	36	110	585	475	3.9	20.8	0.8	0.6
36	0	74	36	110	585	475	3.6	18.9	0.7	0.5
37	0	74	36	110	585	475	3.2	17.2	0.6	0.4
38	0	74	36	110	585	475	2.9	15.6	0.5	0.3
39	0	74	36	110	585	475	2.7	14.2	0.4	0.3
40	0	66	36	102	585	483	2.3	12.9	0.3	0.2
41	0	0	36	36	585	549	0.7	11.8	0.3	0.2
42	0	22	36	58	585	527	1.1	10.7	0.2	0.2
43	0	16	36	52	585	533	0.9	9.7	0.2	0.1
44	0	16	36	52	585	533	0.8	8.8	0.2	0.1
45	0	0	36	36	585	549	0.5	8.0	0.2	0.1
46	0	0	36	36	585	549	0.4	7.3	0.1	0.1
47	0	0	36	36	585	549	0.4	6.6	0.1	0.1
48	0	0	36	36	585	549	0.4	6.0	0.1	0.1
49	0	0	36	36	585	549	0.3	5.5	0.1	0.0
50	0	99	36	135	585	450	1.2	5.0	0.0	0.0
Total	1,933	1,357	1,552	4,842	25,033	20,191	1,435.4	2,985.2	47.4	-0.4
								EIRR=		21.0
								B/C Ratio at 10%		2.08

Table 4.7.13 (2) Calculation of EIRR (Mahottari)

(Unit: Rs. Million)

Year	Project Cost				Project Benefit	Net Benefit	Present Worth Value			
							D. Rate=	0.10	0.13	0.14
	Initial Invest. Cost	Replace-ment Cost	O & M Cost	Total (1)	(2)	(2)-(1)	Project Cost	Project Benefit	Net Benefit	Net Benefit
1	93	0	0	93	0	-93	84.5	0.0	-82.3	-81.6
2	115	0	0	115	0	-115	95.0	0.0	-90.1	-88.5
3	111	0	0	111	0	-111	83.4	0.0	-76.9	-74.9
4	65	0	0	65	0	-65	44.4	0.0	-39.9	-38.5
5	159	0	0	159	0	-159	98.7	0.0	-86.3	-82.6
6	157	0	6	163	91	-72	92.0	51.4	-34.6	-32.8
7	157	0	12	169	132	-37	86.7	67.7	-15.7	-14.8
8	121	0	19	140	162	22	65.3	75.6	8.3	7.7
9	118	0	19	137	183	46	58.1	77.6	15.3	14.1
10	0	0	19	19	193	174	7.3	74.4	51.3	46.9
11	0	0	19	19	198	179	6.7	69.4	46.7	42.4
12	0	18	19	37	203	166	11.8	64.7	38.3	34.5
13	0	18	19	37	203	166	10.7	58.8	33.9	30.2
14	0	0	19	19	203	184	5.0	53.5	33.2	29.4
15	0	0	19	19	203	184	4.5	48.6	29.4	25.8
16	0	0	19	19	203	184	4.1	44.2	26.0	22.6
17	0	0	19	19	203	184	3.8	40.2	23.0	19.8
18	0	0	19	19	203	184	3.4	36.5	20.4	17.4
19	0	0	19	19	203	184	3.1	33.2	18.0	15.3
20	0	46	19	65	203	138	9.7	30.2	12.0	10.0
21	0	46	19	65	203	138	8.8	27.4	10.6	8.8
22	0	64	19	83	203	120	10.2	24.9	8.2	6.7
23	0	64	19	83	203	120	9.3	22.7	7.2	5.9
24	0	46	19	65	203	138	6.6	20.6	7.3	5.9
25	0	44	19	63	203	140	5.8	18.7	6.6	5.3
26	0	44	19	63	203	140	5.3	17.0	5.8	4.6
27	0	44	19	63	203	140	4.8	15.5	5.2	4.1
28	0	44	19	63	203	140	4.4	14.1	4.6	3.6
29	0	28	19	47	203	156	3.0	12.8	4.5	3.5
30	0	0	19	19	203	184	1.1	11.6	4.7	3.6
31	0	0	19	19	203	184	1.0	10.6	4.2	3.2
32	0	18	19	37	203	166	1.8	9.6	3.3	2.5
33	0	18	19	37	203	166	1.6	8.7	2.9	2.2
34	0	0	19	19	203	184	0.7	7.9	2.9	2.1
35	0	46	19	65	203	138	2.3	7.2	1.9	1.4
36	0	46	19	65	203	138	2.1	6.6	1.7	1.2
37	0	46	19	65	203	138	1.9	6.0	1.5	1.1
38	0	46	19	65	203	138	1.7	5.4	1.3	0.9
39	0	46	19	65	203	138	1.6	4.9	1.2	0.8
40	0	0	19	19	203	184	0.4	4.5	1.4	1.0
41	0	0	19	19	203	184	0.4	4.1	1.2	0.9
42	0	18	19	37	203	166	0.7	3.7	1.0	0.7
43	0	18	19	37	203	166	0.6	3.4	0.9	0.6
44	0	0	19	19	203	184	0.3	3.1	0.8	0.6
45	0	28	19	47	203	156	0.6	2.8	0.6	0.4
46	0	28	19	47	203	156	0.6	2.5	0.6	0.4
47	0	28	19	47	203	156	0.5	2.3	0.5	0.3
48	0	28	19	47	203	156	0.5	2.1	0.4	0.3
49	0	28	19	47	203	156	0.4	1.9	0.4	0.3
50	0	62	19	81	203	122	0.7	1.7	0.3	0.2
Total	1,096	1,010	835	2,941	8,876	5,935	858.0	1,110.3	23.8	-24.4
								EIRR=		13.5
								B/C Ratio at 10%		1.29

Table 4.7.13 (3) Calculation of EIRR (Banke)

(Unit: Rs. Million)

Year	Project Cost				Project Benefit	Net Benefit	Present Worth Value			
	Initial Invest. Cost	Replace-ment Cost	O & M Cost	Total (1)	(2)	(2)-(1)	D. Rate= Project Cost	0.10 Project Benefit	0.14 Net Benefit	0.15 Net Benefit
1	93	0	0	93	0	-93	84.5	0.0	-81.6	-80.9
2	116	0	0	116	0	-116	95.9	0.0	-89.3	-87.7
3	112	0	0	112	0	-112	84.1	0.0	-75.6	-73.6
4	61	0	0	61	0	-61	41.7	0.0	-36.1	-34.9
5	173	0	0	173	0	-173	107.4	0.0	-89.9	-86.0
6	170	0	5	175	95	-80	98.8	53.6	-36.4	-34.6
7	170	0	10	180	126	-54	92.4	64.7	-21.6	-20.3
8	121	0	15	136	158	22	63.4	73.7	7.7	7.2
9	0	0	15	15	174	159	6.4	73.8	48.9	45.2
10	0	0	15	15	189	174	5.8	72.9	46.9	43.0
11	0	0	15	15	197	182	5.3	69.0	43.1	39.1
12	0	18	15	33	204	171	10.5	65.0	35.5	32.0
13	0	18	15	33	206	173	9.6	59.7	31.5	28.1
14	0	0	15	15	210	195	3.9	55.3	31.1	27.6
15	0	0	15	15	210	195	3.6	50.3	27.3	24.0
16	0	0	15	15	210	195	3.3	45.7	24.0	20.8
17	0	0	15	15	210	195	3.0	41.5	21.0	18.1
18	0	0	15	15	210	195	2.7	37.8	18.4	15.8
19	0	0	15	15	210	195	2.5	34.3	16.2	13.7
20	0	48	15	63	210	147	9.4	31.2	10.7	9.0
21	0	48	15	63	210	147	8.5	28.4	9.4	7.8
22	0	66	15	81	210	129	10.0	25.8	7.2	6.0
23	0	66	15	81	210	129	9.0	23.5	6.3	5.2
24	0	0	15	15	210	195	1.5	21.3	8.4	6.8
25	0	36	15	51	210	159	4.7	19.4	6.0	4.8
26	0	36	15	51	210	159	4.3	17.6	5.3	4.2
27	0	36	15	51	210	159	3.9	16.0	4.6	3.7
28	0	36	15	51	210	159	3.5	14.6	4.1	3.2
29	0	0	15	15	210	195	0.9	13.2	4.4	3.4
30	0	0	15	15	210	195	0.9	12.0	3.8	2.9
31	0	0	15	15	210	195	0.8	10.9	3.4	2.6
32	0	18	15	33	210	177	1.6	9.9	2.7	2.0
33	0	18	15	33	210	177	1.4	9.0	2.3	1.8
34	0	0	15	15	210	195	0.6	8.2	2.3	1.7
35	0	48	15	63	210	147	2.2	7.5	1.5	1.1
36	0	48	15	63	210	147	2.0	6.8	1.3	1.0
37	0	48	15	63	210	147	1.9	6.2	1.2	0.8
38	0	48	15	63	210	147	1.7	5.6	1.0	0.7
39	0	0	15	15	210	195	0.4	5.1	1.2	0.8
40	0	0	15	15	210	195	0.3	4.6	1.0	0.7
41	0	0	15	15	210	195	0.3	4.2	0.9	0.6
42	0	18	15	33	210	177	0.6	3.8	0.7	0.5
43	0	18	15	33	210	177	0.5	3.5	0.6	0.4
44	0	0	15	15	210	195	0.2	3.2	0.6	0.4
45	0	19	15	34	210	176	0.5	2.9	0.5	0.3
46	0	19	15	34	210	176	0.4	2.6	0.4	0.3
47	0	19	15	34	210	176	0.4	2.4	0.4	0.2
48	0	19	15	34	210	176	0.4	2.2	0.3	0.2
49	0	0	15	15	210	195	0.1	2.0	0.3	0.2
50	0	65	15	80	210	130	0.7	1.8	0.2	0.1
Total	1,016	813	660	2,489	9,119	6,630	798.2	1,122.8	14.2	-29.9
								EIRR=		14.3
								B/C Ratio at 10%		1.41

Table 4.7.14 Cost and Return of Crops (Financial) -Jhapa

District:Jhapa
Crop:Rainfed Paddy-Monsoon

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost *						
Labor	day	32	46	1472	46	1472
Bullock Labor	day	100	16	1600	16	1600
Sub-total				3072		3072
b.Input Cost						
Seed	kg	10.00	62	620	62	620
Manure	kg	0.20	900	180	900	180
Fertilizer						
N	kg	12.17	30	365	40	487
P	kg	17.39	10	174	20	348
K	kg	14.17	0	0	15	213
Agri-Chemicals	kg		0	60		150
Sub-total				1399		1997
Miscellaneous(5% of total)				235		267
Total Costs				4706		5336
2. Gross Income				12021		18085
a. Main Product	ton	4790	2.33	11161	3.50	16765
b. By-product	ton	400	2.15	860	3.30	1320
3. Net Profit	Rs			7314		12749

Note:Hired labor

District:Jhapa
Crop:Irrigated Paddy(HYV)-Monsson

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost *						
Labor	day	32	63	2016	63	2016
Bullock Labor		100	11	1100	11	1100
Sub-total				3116		3116
b.Input Cost						
Seed	kg	10.00	56	560	56	560
Manure	ton	0.20	1650	330	1650	330
Fertilizer						
N	kg	12.17	46	560	80	974
P	kg	17.39	15	261	40	696
K	kg	14.17	10	142	20	283
Agri-Chemicals	kg		0	75		200
Sub-total				1927		3043
Miscellaneous(5% of total)				265		324
Total Costs				5309		6483
2. Gross Income				13902		21080
a. Main Product	ton	4790	2.64	12622	4.00	19160
b. By-product	ton	400	3.20	1280	4.80	1920
3. Net Profit	Rs			8593		14597

Note:Hired labor

District:Jhapa
Crop:Irrigated Paddy(HYV)-Spring Paddy

	Unit	Unit Price (Rs)	Without Project Quant-ity	Value (Rs)	With Project Quant-ity	Value (Rs)
1.Production Cost						
a.Labor Cost *						
Labor	day	32	30	960	30	960
Bullock Labor	day	100	15	1500	15	1500
Sub-total				2460		2460
b.Input Cost						
Seed	kg	10.00	69	690	69	690
Manure	kg	0.20	1090	218	1090	218
Fertilizer						
N	kg	12.17	40	487	70	852
P	kg	17.39	15	261	30	522
K	kg	14.17	10	142	20	283
Agri-Chemicals	kg		0	75		200
Sub-total				1872		2765
Miscellaneous(5% of total)				228		275
Total Costs				4560		5500
2. Gross Income				7450		19962
a. Main Product	ton	4790	1.41	6730	3.80	18202
b. By-product	ton	400	1.80	720	4.40	1760
3. Net Profit	Rs			2890		14462

Note:Hired labor

District:Jhapa
Crop:Maize

	Unit	Unit Price (Rs)	Without Project Quant-ity	Value (Rs)	With Project Quant-ity	Value (Rs)
1.Production Cost						
a.Labor Cost *						
Labor	day	32	0	0	0	0
Bullock Labor		100	5	500	5	500
Sub-total				500		500
b.Input Cost						
Seed	kg	14.20	25	355	25	355
Manure	kg	0.20	2880	576	2880	576
Fertilizer						
N	kg	12.17	25	304	80	974
P	kg	17.39	10	174	40	696
K	kg	14.17	0	0	20	283
Agri-Chemicals	kg			50		200
Sub-total				1459		3084
Miscellaneous(5% of total)				103		189
Total Costs				2062		3772
2. Gross Income				6327		13039
a. Main Product	kg	4590	1.31	6013	2.70	12393
b. By-product	kg	200	1.57	314	3.23	646
3. Net Profit	Rs			4265		9267

Note:Hired labor

District:Jhapa
Crop:Wheat

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost *						
Labor	day	32	15	480	15	480
Bullock Labor	day	100	6	600	6	600
Sub-total				1080		1080
b.Input Cost						
Seed	kg	11.65	120	1398	120	1398
Manure	kg	0.20	1700	340	1700	340
Fertilizer						
N	kg	12.17	40	487	50	609
P	kg	17.39	18	313	40	696
K	kg	14.17	0	0	20	283
Agri-Chemicals	kg		0	50		150
Sub-total				2588		3476
Miscellaneous(5% of total)				193		240
Total Costs				3861		4795
2. Gross Income				7165		12168
a. Main Product	ton	4250	1.59	6758	2.70	11475
b. By-product	ton	250	1.63	408	2.77	693
3. Net Profit	Rs			3304		7372

Note:Hired labor

District:Jhapa
Crop:Lentil & Pulses

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost *						
Labor	day	32	18	576	18	576
Bullock Labor		100	0	0	0	0
Sub-total				576	0	576
b.Input Cost						
Seed	kg	18.00	22	396	22	396
Manure	kg	0.20	300	60	300	60
Fertilizer						
N	kg	12.17	15	183	25	304
P	kg	17.39	20	348	40	696
K	kg	14.17	0	0	0	0
Agri-Chemicals	kg		0	0		65
Sub-total				986		1521
Miscellaneous(5% of total)				82		110
Total Costs				1645		2207
2. Gross Income				9097		16677
a. Main Product	ton	14940	0.60	8964	1.10	16434
b. By-product	ton	250	0.53	133	0.97	243
3. Net Profit	Rs			7452		14469

Note:Hired labor

District:Jhapa
Crop:Mustard(Oilcrops)

	Unit	Unit Price (Rs)	Without Project Quant-ity	Value (Rs)	With Project Quant-ity	Value (Rs)
1.Production Cost						
a.Labor Cost *						
Labor	day	32	8	256	8	256
Bullock Labor		100	13	1300	13	1300
Sub-total				1556		1556
b.Input Cost						
Seed	kg	23.00	20	460	20	460
Manure	kg	0.20	2500	500	2500	500
Fertilizer						
N	kg	12.17	35	426	50	609
P	kg	17.39	10	174	40	696
K	kg	14.17	0	0	30	425
Agri-Chemicals	kg		0	0		150
Sub-total				1560		2839
Miscellaneous(5% of total)				164		231
Total Costs				3280		4627
2. Gross Income				14255		18694
a. Main Product	ton	23110	0.61	14097	0.80	18488
b. By-product	ton	200	0.79	158	1.03	206
3. Net Profit	Rs			10975		14067

Note:Hired labor

District:Jhapa
Crop:Potato

	Unit	Unit Price (Rs)	Without Project Quant-ity	Value (Rs)	With Project Quant-ity	Value (Rs)
1.Production Cost						
a.Labor Cost *						
Labor	day	32	176	5632	176	5632
Bullock Labor		100	6	600	6	600
Sub-total				6232		6232
b.Input Cost						
Seed	kg	10.00	950	9500	950	9500
Manure	kg	0.20	11500	2300	11500	2300
Fertilizer						
N	kg	12.17	300	3651	330	4016
P	kg	17.39	100	1739	110	1913
K	kg	14.17	25	354	28	390
Agri-Chemicals	kg		0	150		300
Sub-total				17694		18419
Miscellaneous(5% of total)				1259		1297
Total Costs				25186		25948
2. Gross Income				35269		46560
a. Main Product	ton	3880	9.09	35269	12.00	46560
b. By-product	ton	0	0	0	0	0
3. Net Profit	Rs			10084		20612

Note:Hired labor

District:Jhapa
Crop:Vegetables(Cauliflower)

	Unit	Unit Price (Rs)	Without Project		With Project	
			Quant-ity	Value (Rs)	Quant-ity	Value (Rs)
1.Production Cost						
a.Labor Cost *						
Labor	day	32	145	4640	145	4640
Bullock Labor		100	5	500	5	500
Sub-total				5140		5140
b.Input Cost						
Seed	kg	300	0.5	150	0.5	150
Manure	kg	0.20	15000	3000	15000	3000
Fertilizer						
N	kg	12.17	50	609	100	1217
P	kg	17.39	48	835	80	1391
K	kg	14.17	25	354	50	709
Agri-Chemicals	kg			150		300
Sub-total				5097		6767
Miscellaneous(5% of total)				539		627
Total Costs				10776		12533
2. Gross Income				47524		84590
a. Main Product	ton	7690	6.18	47524	11.00	84590
b. By-product	ton	0	0.30	0	0.50	0
3. Net Profit	Rs			36748		72057

Note:Hired labor

Table 4.7.15 Cost and Return of Crops(Financial)-Mahottari

District:Mahottari
Crop:Rainfed Paddy-Monsoon

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	35	54	1890	54	1890
Bullock Labor	day	100	10	1000	10	1000
Sub-total				2890		2890
b.Input Cost						
Seed	kg	8.50	64	544	64	544
Manure	kg	0.20	900	180	900	180
Fertilizer						
N	kg	11.22	35	393	40	449
P	kg	17.39	10	174	20	348
K	kg	13.58	0	0	15	204
Agri-Chemicals			0	0		200
Sub-total				1291		1924
Miscellaneous(5% of total)				220		253
Total Costs				4401		5068
2. Gross Income				15020		18421
a. Main Product	ton	6070	2.29	13870	2.80	16996
b. By-product	ton	500	2.30	1150	2.85	1425
3. Net Profit				10619		13353

District:Mahottari
Crop:Irrigated Paddy(HYV)-Monsson

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	35	57	1995	57	1995
Bullock Labor	day	100	11	1100	11	1100
Sub-total				3095		3095
b.Input Cost						
Seed	kg	8.50	60	510	60	510
Manure	kg	0.20	2100	420	2100	420
Fertilizer						
N	kg	11.22	62	696	80	898
P	kg	17.39	20	348	40	696
K	kg	13.58	10	136	20	272
Agri-Chemicals			0	0		200
Sub-total				2109		2995
Miscellaneous(5% of total)				274		321
Total Costs				5478		6410
2. Gross Income				17733		22388
a. Main Product	ton	6070	2.70	16413	3.40	20638
b. By-product	ton	500	2.64	1320	3.50	1750
3. Net Profit				12255		15978

District:Mahottari
Crop:Irrigated Paddy(HYV)-Spring Paddy

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	35	30	1050	30	1050
Bullock Labor	day	100	15	1500	15	1500
Sub-total				2550		2550
b.Input Cost						
Seed	kg	8.50	60	510	60	510
Manure	kg	0.20	2000	400	2000	400
Fertilizer						
N	kg	11.22	50	561	70	785
P	kg	17.39	15	261	30	522
K	kg	13.58	10	136	20	272
Agri-Chemicals			0	0		200
Sub-total				1868		2689
Miscellaneous(5% of total)				233		276
Total Costs				4650		5514
2. Gross Income				19999		23682
a. Main Product	kg	6070	3.05	18514	3.60	21852
b. By-product	kg	500	2.97	1485	3.66	1830
3. Net Profit				15348		18168

District:Mahottari
Crop:Maize

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	35	0	0	0	0
Bullock Labor	day	100	4	400	4	400
Sub-total				400		400
b.Input Cost						
Seed	kg	15.00	28	420	28	420
Manure	kg	0.20	2100	420	2100	420
Fertilizer						
N	kg	11.22	60	673	80	898
P	kg	17.39	10	174	30	522
K	kg	13.58	0	0	20	272
Agri-Chemicals				25		200
Sub-total				1712		2731
Miscellaneous(5% of total)				111		165
Total Costs				2223		3296
2. Gross Income				10060		13432
a. Main Product	ton	4920	1.95	9594	2.60	12792
b. By-product	ton	200	2.33	466	3.20	640
3. Net Profit				7837		10136

District:Mahottari
Crop:Wheat

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	35	8	280	8	280
Bullock Labor	day	100	6	600	6	600
Sub-total				880		880
b.Input Cost						
Seed	kg	10.50	120	1260	120	1260
Manure	kg	0.20	1800	360	1800	360
Fertilizer						
N	kg	11.22	65	729	70	785
P	kg	17.39	20	348	40	696
K	kg	13.58	10	136	20	272
Agri-Chemicals			0	0		200
Sub-total				2833		3573
Miscellaneous(5% of total)				195		234
Total Costs				3908		4687
2. Gross Income				9351		16427
a. Main Product	ton	6010	1.48	8895	2.60	15626
b. By-product	ton	300	1.52	456	2.67	801
3. Net Profit				5442		11740

District:Mahottari
Crop:Lentil & Pulses

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	35	5	175	5	175
Bullock Labor	day	100	0	0	0	0
Sub-total				175		175
b.Input Cost						
Seed	kg	18.00	35	630	35	630
Manure	kg	0.20	1200	240	1200	240
Fertilizer						
N	kg	11.22	7	79	25	281
P	kg	17.39	10	174	40	696
K	kg	13.58	0	0	0	0
Agri-Chemicals	kg		0	0		200
Sub-total				1122		2046
Miscellaneous(5% of total)				68		117
Total Costs				1366		2338
2. Gross Income				9097		16677
a. Main Product	kg	14940	0.60	8964	1.10	16434
b. By-product	kg	250	0.53	133	0.97	243
3. Net Profit				7731		14339

District:Mahottari
Crop:Mustard(Oilcrops)

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	35	8	280	8	280
Bullock Labor	day	100	5	500	5	500
Sub-total				780		780
b.Input Cost						
Seed	kg	22.00	20	440	20	440
Manure	kg	0.20	2500	500	2500	500
Fertilizer						
N	kg	11.22	35	393	50	561
P	kg	17.39	10	174	30	522
K	kg	13.58	0	0	30	407
Agri-Chemicals			0	0		200
Sub-total				1507		2630
Miscellaneous(5% of total)				120		179
Total Costs				2407		3590
2. Gross Income				12819		18990
a. Main Product	kg	23480	0.54	12679	0.80	18784
b. By-product	kg	200	0.70	140	1.03	206
3. Net Profit				10412		15400

District:Mahottari
Crop:Potato

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day	35	185	6475	185	6475
Bullock Labor	day	100	12	1200	12	1200
Sub-total				7675		7675
b.Input Cost						
Seed	kg	8.00	990	7920	990	7920
Manure	kg	0.20	15100	3020	15100	3020
Fertilizer						
N	kg	11.22	300	3366	310	3478
P	kg	17.39	100	1739	110	1913
K	kg	13.58	50	679	50	679
Agri-Chemicals			0	0		300
Sub-total				16724		17310
Miscellaneous(5% of total)				1284		1315
Total Costs				25683		26300
2. Gross Income				45662		54360
a. Main Product	ton	4530	10.08	45662	12.00	54360
b. By-product	ton	0	0	0	0	0
3. Net Profit				19979		28060

District:Mahottari
Crop:Vegetables(Cauliflower)

	Unit	Unit Price (Rs)	Without Project Quant-ity	Value (Rs)	With Project Quant-ity	Value (Rs)
1. Production Cost						
a. Labor Cost						
Labor	day	35	140	4900	140	4900
Bullock Labor	day	100	5	500	5	500
Sub-total				5400		5400
b. Input Cost						
Seed	kg	300	0.5	150	0.5	150
Manure	kg	0.2	14500	2900	14500	2900
Fertilizer						
N	kg	11.22	50	561	100	1122
P	kg	17.39	48	835	80	1391
K	kg	13.58	25	340	50	679
Agri-Chemicals				300		500
Sub-total				5085		6742
Miscellaneous(5% of total)				552		639
Total Costs				11037		12781
2. Gross Income				60000		72000
a. Main Product	ton	6000	10.00	60000	12.00	72000
b. By-product	ton	0	0.30	0	0.50	0
3. Net Profit				48963		59219

District:Mahottari
Crop:Onion

	Unit	Unit Price (Rs)	Without Project Quant-ity	Value (Rs)	With Project Quant-ity	Value (Rs)
1. Production Cost						
a. Labor Cost						
Labor	day	35	20	700	22	770
Bullock Labor	day	100	5	500	5	500
Sub-total				1200		1270
b. Input Cost						
Seed	kg	225	8.0	1800	8.0	1800
Manure	kg	0.2	30000	6000	30000	6000
Fertilizer						
N	kg	11.22	55	617	66	741
P	kg	17.39	45	783	54	939
K	kg	13.58	60	815	70	951
Agri-Chemicals				500		600
Sub-total				10514		11030
Miscellaneous(5% of total)				617		647
Total Costs				12331		12948
2. Gross Income				41400		53820
a. Main Product	ton	4140	10.00	41400	13.00	53820
b. By-product	ton	0	0.00	0	0.50	0
3. Net Profit				29069		40872

Table 4.7.16 Cost and Return of Crops(Financial)-Banke

District:Banke
Crop:Rainfed Paddy-Monsoon

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost *						
Labor	day	37	70	2590	70	2590
Bullock Labor	day	100	4	400	4	400
Sub-total				2990		2990
b.Input Cost						
Seed	kg	9.05	65	588	65	588
Manure	kg	0.20	570	114	800	160
Fertilizer						
N	kg	12.17	45	548	40	487
P	kg	18.08	10	181	20	362
K	kg	14.16	0	0	15	212
Agri-Chemicals			0	0		200
Sub-total				1431		2009
Miscellaneous(5% of total)				233		263
Total Costs				4653		5262
2. Gross Income				11300		15102
a. Main Product	ton	5270	1.95	10250	2.60	13702
b. By-product	ton	500	2.10	1050	2.80	1400
3. Net Profit				6647		9840

Note:Hired labor

District:Banke
Crop:Irrigated Paddy(HYV)-Monsson

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost *						
Labor	day	37	77	2849	77	2849
Bullock Labor	day	100	3	300	3	300
Sub-total				3149		3149
b.Input Cost						
Seed	kg	9.05	64	579	64	579
Manure	kg	0.20	400	80	400	80
Fertilizer						
N	kg	12.17	50	609	80	974
P	kg	18.08	15	271	40	723
K	kg	14.16	10	142	20	283
Agri-Chemicals			0	0		200
Sub-total				1681		2839
Miscellaneous(5% of total)				254		315
Total Costs				5084		6303
2. Gross Income				12182		20145
a. Main Product	ton	5270	2.12	11172	3.50	18445
b. By-product	ton	500	2.02	1010	3.40	1700
3. Net Profit				7099		13842

Note:Hired labor

District:Banke
Crop:Irrigated Paddy(HYV)-Spring Paddy

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost						
Labor	day					
Bullock Labor	day					
Sub-total						
b.Input Cost						
Seed	kg					
Manure	kg					
Fertilizer						
N	kg					
P	kg					
K	kg					
Agri-Chemicals						
Sub-total						
Miscellaneous(5% of total)						
Total Costs						
2. Gross Income						
a. Main Product	ton					
b. By-product	ton					
3. Net Profit						

District:Banke
Crop:Maize

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost *						
Labor	day	37	6	222	6	222
Hired Labor	day	100	4	400	4	400
Sub-total				622		622
b.Input Cost						
Seed	kg	14.90	26	387	26	387
Manure	kg	0.20	5640	1128	5640	1128
Fertilizer						
N	kg	12.17	10	122	70	852
P	kg	18.08	10	181	40	723
K	kg	14.16	0	0	20	283
Agri-Chemicals				0		300
Sub-total				1818		3674
Miscellaneous(5% of total)				128		226
Total Costs				2568		4522
2. Gross Income				9450		15257
a. Main Product	ton	5570	1.61	8968	2.60	14482
b. By-product	ton	250	1.93	483	3.10	775
3. Net Profit				6882		10735

Nte:Hired labor

District:Banke
Crop:Wheat

	Unit	Unit Price (Rs)	Without Project: Quant-ity	Value (Rs)	With Project Quant-ity	Value (Rs)
1. Production Cost						
a. Labor Cost *						
Labor	day	37	5	185	5	185
Bullock Labor	day	100	10	1000	10	1000
Sub-total				1185		1185
b. Input Cost						
Seed	kg	11.65	125	1456	125	1456
Manure	kg	0.20	975	195	975	195
Fertilizer						
N	kg	12.17	30	365	50	609
P	kg	18.08	15	271	40	723
K	kg	14.16	0	0	20	283
Agri-Chemicals			0	0		200
Sub-total				2288		3466
Miscellaneous(5% of total)				183		245
Total Costs				3655		4896
2. Gross Income				9192		13789
a. Main Product	ton	6310	1.40	8834	2.10	13251
b. By-product	ton	250	1.43	358	2.15	538
3. Net Profit				5536		8893

Note:Hired labor

District:Banke
Crop:Lentil & Pulses

	Unit	Unit Price (Rs)	Without Project: Quant-ity	Value (Rs)	With Project Quant-ity	Value (Rs)
1. Production Cost						
a. Labor Cost *						
Labor	day	37	0	0	0	0
Bullock Labor	day	100	0	0	0	0
Sub-total				0	0	0
b. Input Cost						
Seed	kg	18.50	23	426	23	426
Manure	kg	0.20	450	90	450	90
Fertilizer						
N	kg	12.17	10	122	25	304
P	kg	18.08	0	0	40	723
K	kg	14.16	0	0	0	0
Agri-Chemicals			0	0		200
Sub-total				637		1743
Miscellaneous(5% of total)				34		92
Total Costs				671		1835
2. Gross Income				14838		21825
a. Main Product	ton	21600	0.68	14688	1.00	21600
b. By-product	ton	250	0.60	150	0.90	225
3. Net Profit				14167		19990

Note:Hired labor

District:Banke
Crop:Mustard(Oilcrops)

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost *						
Labor	day	37	0	0	0	0
Bullock Labor	day	100	0	0	0	0
Sub-total				0		0
b.Input Cost						
Seed	kg	30.00	20	600	20	600
Manure	kg	0.20	3600	720	3600	720
Fertilizer						
N	kg	12.17	10	122	50	609
P	kg	18.08	0	0	40	723
K	kg	14.16	0	0	30	425
Agri-Chemicals			0	0		200
Sub-total				1442		3277
Miscellaneous(5% of total)				76		172
Total Costs				1518		3449
2. Gross Income				11324		16434
a. Main Product	ton	20330	0.55	11182	0.80	16264
b. By-product	ton	200	0.71	142	0.85	170
3. Net Profit				9806		12985

Note:Hired labor

District:Banke
Crop:Potato

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost *						
Labor	day	37	250	9250	250	9250
Bullock Labor	day	100	5	500	5	500
Sub-total				9750		9750
b.Input Cost						
Seed	kg	8.00	560	4480	560	4480
Manure	kg	0.20	8000	1600	8000	1600
Fertilizer						
N	kg	12.17	40	487	45	548
P	kg	18.08	20	362	22	398
K	kg	14.16	0	0	0	0
Agri-Chemicals			0	0		300
Sub-total				6928		7325
Miscellaneous(5% of total)				878		899
Total Costs				17556		17974
2. Gross Income				43128		50400
a. Main Product	ton	3600	11.98	43128	14.00	50400
b. By-product	ton	0	0	0	0	0
3. Net Profit				25572		32426

Note:Hired labor

District:Banke
Crop:Vegetables(Cauliflower)

	Unit	Unit Price (Rs)	Without Project Quant-ity	Without Project Value (Rs)	With Project Quant-ity	With Project Value (Rs)
1.Production Cost						
a.Labor Cost *						
Labor	day	37	140	5180	140	5180
Bullock Labor	day	100	5	500	5	500
Sub-total				5680		5680
b.Input Cost						
Seed	kg	550	0.5	275	0.5	275
Manure	kg	0.20	15000	3000	15000	3000
Fertilizer				0		
N	kg	12.17	50	609	80	974
P	kg	18.08	48	868	70	1266
K	kg	14.16	25	354	40	566
Agri-Chemicals				500		300
Sub-total				5605		6381
Miscellaneous(5% of total)				594		635
Total Costs				11879		12695
2. Gross Income				62020		77000
a. Main Product	ton	7000	8.86	62020	11.00	77000
b. By-product	ton	0	0.50	0	0.80	0
3. Net Profit				50141		64305

Note:Hired labor

Table 4.7.17 Financial Analysis for Typical Farm-Jhapa

Farm Model-Without Project
Jhapa (farm size 1.41ha)

1. Crop Production

	Area (ha)	Yield (ton/ha)		Production (ton)		Price (Rs/ton)		Value of Production (Rs)			Production Cost (Rs)	Net Income (Rs)
		Main Product	By-Product	Main Product	By-Product	Main Product	By-Product	Main Product	By-Product	Total		
M. Paddy-raifed	1.27	2.33	2.15	2.96	2.73	4790	400	14163	1091	15254	6635	8619
Maize	0.14	1.31	1.57	0.18	0.22	4590	200	848	44	892	289	603
Wheat	0.37	1.59	1.63	0.58	0.60	4250	250	2477	149	2627	1429	1198
Total	1.78							17488	1285	18773	8353	10420

2. Income from Livestock (Rs)	2084
3. Off-farm Income (Rs/year)	521
4. Total Income (Rs)	13025
5. Living Expence (Rs/year) -Family size 5.36 person/family	11552
Food (Rs)	7220
Non-food (Rs)	4332
6. Disposable Income (Rs/year)	1473

Farm Model-With Project
Jhapa (farm size 1.41ha)

1. Crop Production

	Area (ha)	Yield (ton/ha)		Production (ton)		Price (Rs/ton)		Value of Production (Rs)			Production Cost (Rs)	Net Income (Rs)
		Main Product	By-Product	Main Product	By-Product	Main Product	By-Product	Main Product	By-Product	Total		
M. Paddy-irrigated	1.41	4.00	4.80	5.64	6.77	4790	400	27016	2707	29723	9141	20582
S. Paddy-irrigated	0.56	3.80	4.40	2.14	2.48	4790	400	10266	993	11259	3080	8179
Maize	0.21	2.70	3.23	0.57	0.68	4590	200	2621	137	2758	792	1966
Wheat	0.42	2.70	2.77	1.14	1.17	4250	250	4854	293	5147	2014	3133
Miscellaneous	0.21	0.80	1.03	0.17	0.22	23110	200	3910	5034	8945	5449	3496
Total	2.82							48667	9164	57831	20476	37354

2. Income from Livestock (Rs)	7471
3. Off-farm Income (Rs/year)	1868
4. Total Income (Rs)	46693
5. Living Expence (Rs/year) -Family size 5.36 person/family	44013
Food (Rs)	27508
Non-food (Rs)	16505
6. Disposable Income (Rs/year)	2680

Table 4.7.18 Financial Analysis for Typical Farm-Mahottari

Farm Model-Without Project
Mahottari (farm size 1.09ha)

1. Crop Production

	Area (ha)	Yield (ton/ha) Main Product	Yield (ton/ha) By-Product	Production (ton) Main Product	Production (ton) By-Product	Price (Rs/ton) Main Product	Price (Rs/ton) By-Product	Value of Production (Rs) Main Product	Value of Production (Rs) By-Product	Value of Production (Rs) Total	Production Cost (Rs)	Net Income (Rs)
M.Paddy-raifed	0.98	2.29	2.30	2.25	2.26	6070	500	13636	1128	14764	4797	9967
Wheat	0.22	1.48	1.52	0.32	0.33	6010	300	1939	99	2038	860	1179
Pulses	0.22	0.60	0.53	0.13	0.12	14940	250	1954	29	1983	301	1683
Others	0.11	0.54	0.70	0.06	0.08	23480	200	1382	15	1397	265	1133
Total	1.53							18911	1272	20183	6222	13961

2. Income from Livestock (Rs)	1955
3. Off-farm Income (Rs/year)	838
4. Total Income (Rs)	16753
5. Living Expence (Rs/year) -Family size 5.48 person/family	9984
Food (Rs)	6240
Non-food (Rs)	3744
6. Disposable Income (Rs/year)	6769

Farm Model-With Project
Mahottari (farm size 1.09ha)

1. Crop Production

	Area (ha)	Yield (ton/ha) Main Product	Yield (ton/ha) By-Product	Production (ton) Main Product	Production (ton) By-Product	Price (Rs/ton) Main Product	Price (Rs/ton) By-Product	Value of Production (Rs) Main Product	Value of Production (Rs) By-Product	Value of Production (Rs) Total	Production Cost (Rs)	Net Income (Rs)
M.Paddy-irrigated	1.09	3.40	3.50	3.71	3.82	6070	500	22495	1908	24403	6987	17416
S.Paddy-irrigated	0.11	3.60	3.66	0.39	0.40	6070	500	2382	199	2581	607	1975
Wheat	0.53	2.60	2.67	1.39	1.43	6010	300	8346	428	8774	2484	6290
Onion	0.21	13.00	0.50	2.69	0.10	4140	0	11146	0	11146	2719	8427
Potato	0.24	12.00	0.00	2.88	0.00	4530	0	13036	0	13036	6312	6724
Total	2.18							57405	2535	59940	19109	40831

2. Income from Livestock (Rs)	5716
3. Off-farm Income (Rs/year)	2450
4. Total Income (Rs)	48997
5. Living Expence (Rs/year) -Family size 5.48 person/family	40416
Food (Rs)	23774
Non-food (Rs)	16642
6. Disposable Income (Rs/year)	8581

Table 4.7.19 Financial Analysis for Typical Farm-Banke

Farm Model-Without Project
Banke(farm size 1.37ha)

1. Crop Production

	Area (ha)	Yield(ton/ha) Main Product	Yield(ton/ha) By-Product	Production(ton) Main Product	Production(ton) By-Product	Price(Rs/ton) Main Product	Price(Rs/ton) By-Product	Value of Production(Rs) Main Product	Value of Production(Rs) By-Product	Value of Production(Rs) Total	Production Cost(Rs)	Net Income (Rs)
M.Paddy-raifed	1.22	1.95	2.10	2.38	2.56	5270	500	12537	1281	13818	5118	8700
Maize	0.14	1.61	1.93	0.22	0.26	5570	250	1229	66	1295	257	1038
Mustard	0.14	0.55	0.71	0.08	0.10	20330	200	1532	19	1551	213	1339
Wheat	0.30	1.40	1.43	0.42	0.43	6310	250	2650	107	2757	2010	747
Pulses	0.13	0.68	0.60	0.09	0.08	21600	250	1909	20	1929	94	1835
Total	1.92							19857	1493	21351	7692	13659

2. Income from Livestock(Rs)	2185
3. Off-farm Income(Rs/year)	273
4. Total Income(Rs)	16118
5. Living Expence(Rs/year)-Family size 5.9 person/family	11328
Food(Rs)	7080
Non-food(Rs)	4248
6. Disposable Income(Rs/year)	4790

Farm Model-With Project
Banke(farm size 1.37ha)

1. Crop Production

	Area (ha)	Yield(ton/ha) Main Product	Yield(ton/ha) By-Product	Production(ton) Main Product	Production(ton) By-Product	Price(Rs/ton) Main Product	Price(Rs/ton) By-Product	Value of Production(Rs) Main Product	Value of Production(Rs) By-Product	Value of Production(Rs) Total	Production Cost(Rs)	Net Income (Rs)
M.Paddy-irrigated	1.19	3.50	3.40	4.17	4.05	5270	500	21950	2023	23973	7501	16472
Mustard	0.18	0.80	0.85	0.14	0.15	20330	200	2897	30	2927	621	2306
Wheat	0.69	2.10	2.15	1.45	1.48	6310	250	9143	371	9514	3378	6136
Pulses	0.23	1.00	0.90	0.23	0.21	21600	250	5031	52	5083	422	4661
Maize	0.21	2.60	3.10	0.53	0.64	5570	250	2976	159	3135	950	2186
Potato	0.21	14.00	0.00	2.88	0.00	3600	0	10357	0	10357	539	9818
Others	0.04	11.00	0.80	0.45	0.00	7000	0	3165	0	3165	508	2657
Total	2.74							55518	2636	58154	13918	44235

2. Income from Livestock(Rs)	7078
3. Off-farm Income(Rs/year)	885
4. Total Income(Rs)	52198
5. Living Expence(Rs/year)-Family size 5.9 person/family	43160
Food(Rs)	26975
Non-food(Rs)	16185
6. Disposable Income(Rs/year)	9038

APPENDIX - FIVE

SCORE OF WORK

APPENDIX FIVE: SCOPE OF WORK

SCOPE OF WORK
FOR
THE MASTER PLAN STUDY
ON
THE TERAI GROUNDWATER RESOURCES EVALUATION
AND
DEVELOPMENT PROJECT FOR IRRIGATION
IN
THE KINGDOM OF NEPAL

AGREED UPON BETWEEN
DEPARTMENT OF IRRIGATION
MINISTRY OF WATER RESOURCES
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

KATHMANDU, MARCH 26, 1991

Mr. M. D. Karki
Director General,
Department of Irrigation,
Ministry of Water Resources,
His Majesty's Government
of Nepal

Mr. Yasunobu MATOBA
Leader,
Preliminary Survey Team,
Japan International
Cooperation Agency

I. INTRODUCTION

In response to the request of His Majesty's Government of Nepal (hereinafter referred to as "HMGN"), the Government of Japan has decided to implement the Master Plan Study for the Terai Groundwater Resources Evaluation and Development Project for Irrigation (hereinafter referred to as "the Study"), in accordance with the relevant laws and regulations in force in Japan.

The Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the Government of Japan, will undertake the Study, in close cooperation with the authorities concerned of HMGN.

The Department of Irrigation, Ministry of Water Resources (hereinafter referred to as "DOI") shall act as counterpart agency to the JICA Study Team and also as coordinating body in relation with other governmental and non- governmental organization concerned for the smooth implementation of theStudy.

The present document sets forth the Scope of Work with regard to the Study.

II. OBJECTIVES OF THE STUDY

1. To formulate a groundwater development master plan under the Groundwater Resources Evaluation and Development Project for Irrigation in a selected District in the Terai plain, and

2. To carry out technology transfer to the Nepalese counterpart personnel in the course of the Study.

III. OUTLINE OF THE STUDY

1. Study Area

The Study covers following three (3) Districts in the Terai plain.

1) Banke District including a part of the Bardia District on the left bank of the Babai River,

2) Mahottari District, and

3) Jhapa District excluding the Kankai Irrigation Project area.

2. Scope of the Study

In order to achieve the above objectives, the Study will consist of two phases and will cover the following :

1)Phase I

1)-1 To collect and review existing data and information and to carry out field survey and investigation in the three Districts in view of topography, meteorology, hydrology, geology, soil, hydrogeology, groundwater resources, agriculture, irrigation system(surface water and groundwater), and existing irrigation projects and water resources development plans,

1)-2 To evaluate groundwater resources for irrigation,

1)-3 To identify the groundwater irrigation potential and to formulate technical and management concepts for groundwater irrigation, and

1)-4 To select a most prospective District with the highest potential for deep tubewell development for irrigation.

2)Phase II

2)-1 To carry out hydrogeological survey, geophysical investigations, construction of observation wells, monitoring of groundwater resources, and assessment and evaluation of groundwater resources in a representative area in the selected District,

2)-2 To formulate a groundwater monitoring network plan in the

representative area, and

2)-3 To formulate a groundwater development and management plan in the representative area,

2)-4 To formulate a groundwater development master plan under the Groundwater Resources Evaluation and Development Project for Irrigation in the selected District. The Master Plan will include substancial items, such as

-Comprehensive evaluation of the groundwater resources,

-Guidelines for developing groundwater resources for irrigation,

-Data base of hydrogeologic and hydrometeorological information, and

-Guidelines for operating groundwater monitoring network.

IV. WORK SCHEDULE

The Study will be executed in accordance with the attached tentative work schedule.

V. REPORTS

JICA shall prepare and submit following reports in English to HMGN.

(1) Inception Report

Twenty (20) copies at the commencement of the Study.

(2) Progress Report (I)

Twenty (20) copies at the end of the field work in the Phase I study.

(3) Interim Report

Twenty (20) copies at the end of the Phase I study.

(4) Progress Report (II)

Twenty (20) copies at the end of the second field work in the Phase II study.

(5) Progress Report (III)

Twenty (20) copies at the end of the fourth field work in the Phase II study.

(6) Draft Final Report

Twenty (20) copies at the end of the Phase II study.
HMGN provides JICA with its comments on the Draft Final Report within one (1) month after receipt of the Draft Final Report.

(7) Final Report

Fifty (50) copies within two (2) months after receiving HMGN's comments on the Draft Final Report.

VI. UNDERTAKING OF HMGN

1. To facilitate smooth conduct of the Study, HMGN shall take necessary measures;

(1) to secure the safety of the Japanese study team,

(2) to permit the members of the Japanese study team to enter, leave and sojourn in the Kingdom of Nepal for the duration of their assignment therein, and exempt them from alien registration requirements and consular fees,

(3) to exempt the members of the Japanese study team from taxes, duties, fees and any other charges on equipment, machinery and other materials brought into the Kingdom of Nepal for the conduct of the

Study,

(4) to exempt the members of the Japanese study team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Japanese study team for their services in connection with the implementation of the Study,

(5) to provide necessary facilities to the Japanese study team for the remittance as well as utilization of the funds introduced into the Kingdom of Nepal from Japan in connection with the implementation of the Study,

(6) to secure permission for entry into private properties or restricted areas for the conduct of the Study as and when necessity arises,

(7) to secure permission for the Japanese study team to take all data and documents related to the Study including photographs and maps out of the Kingdom of Nepal to Japan,

(8) to provide medical services as needed. Its expense will be chargeable on the members of the Japanese study team.

2. HMGN shall bear claims, if any arises, against the members of the Japanese study team, resulting from, occuring in the course of, or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or wilful misconduct on the part of the members of the Japanese study team.

3. DOI shall, at its own expense, provide the Japanese study team with the followings, in cooperation with other authorities concerned:

1) Available data and information related to the Study,

2) Counterpart personnel,

3) Suitable office with necessary furniture in Kathmandu and project sites,

4) Credentials or identification cards,

5) Permission for use of radio communication (Walkie Talkie), and

6) Arrangement for procuring fuel for vehicles and boring machines.

VII. UNDERTAKING OF JICA

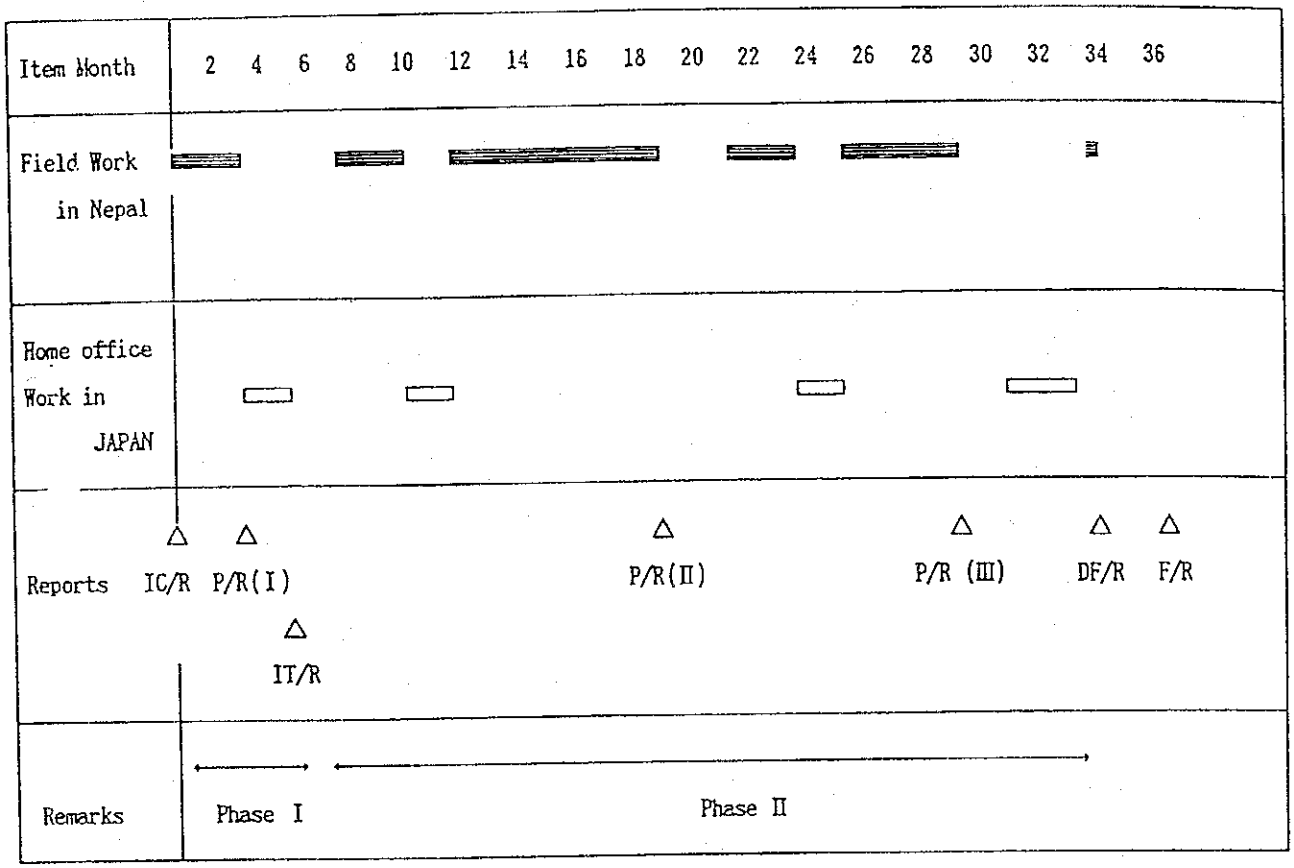
For the conduct of the Study, JICA shall take the following measures;

1. To dispatch study teams, at its own expense, to the Kingdom of Nepal, and
2. To conduct technology transfer to the Nepalese counterpart personnel in the course of the Study.

VIII. JICA and DOI will consult with each other in respect of any other matter that is not agreed upon in this document and may arise from or in connection with the Study.

APPENDIX

TENTATIVE SCHEDULE



(Remarks) IC/R : Inception Report P/R : Progress Report

IT/R : Interim Report DF/R : Draft Final Report

F/R : Final Report

: Field Work

: Home Office Work

MINUTES OF MEETING
ON
SCOPE OF WORK
FOR
THE MASTER PLAN STUDY
ON
THE TERAI GROUNDWATER RESOURCES EVALUATION
AND
DEVELOPMENT PROJECT FOR IRRIGATION
IN
THE KINGDOM OF NEPAL

The Preliminary Survey Team (hereinafter referred to as "the Team") organized by Japan International Cooperation Agency (hereinafter referred to as "JICA"), and headed by Mr. Yasunobu MATOBA, visited the Kingdom of Nepal from March 18 to March 27, 1991 for the purpose of discussing and confirming the Scope of Work for the Master Plan Study on The Terai Groundwater Resources Evaluation and Development Project for Irrigation in the Kingdom of Nepal (hereinafter referred to as "the Study").

The Team had a series of discussions with the officials concerned of the Department of Irrigation, Ministry of Water Resources of His Majesty's Government of Nepal (hereinafter referred to as "DOI") on the Scope of Work for the Study. The list of participants in a series of meetings is shown in the attached paper.

As a result of the discussions, the Team and the DOI agreed on the Scope of Work for the Study.

The following are the main issues discussed and agreed upon by both sides in relation to the Scope of Work for the Study.

1. The office for the Japanese study team should be equipped with electricity, city water, and telephone.

2. The DOI shall, at its own expense, prepare vehicles for the Nepalese counterpart personnel.

3. The DOI requested that the following equipment necessary for the Study be procured by JICA and be donated to the DOI after the termination of the Study. The Team promised to convey its request to the Government of Japan.
   a. Vehicles,
   b. Bore hole electric loggers,
   c. Groundwater level indicaters,
   d. Photocopy machines,
   e. Personal computers, and
   f. Portable kits for chemical analysis.

Kathmandu, March 26, 1991

Mr. M. D. Karki
Director General,
Department of Irrigation,
Ministry of Water Resources,
His Majesty's Government
of Nepal

Mr. Yasunobu MATOBA
Leader,
Preliminary Survey Team,
Japan International
Cooperation Agency

Attachment

LIST OF PARTICIPANTS

I. Nepalese Side

Ministry of Water Resources

Mr. M. D. Karki	Director General, Department of Irrigation (DOI)
Mr. Y. L. Vaidya	Deputy Director General, DOI
Mr. A. B. Thapa	Superintending Engineer, DOI
Mr. G. P. Chaturvedi	Project Manager, Groundwater Resources Development Project
Mr. S. R. Uprety	Divisional Geologist, DOI

II. Japanese Side

Preliminary Survey Team

Mr. Yasunobu Matoba	Leader
Mr. Takashige Ueta	Member
Mr. Akio Yamamoto	Member
Mr. Norio Matsuda	Member

APPENDIX - SIX

LIST OF MEMBERS RELATED

TO THE STUDY

APPENDIX SIX: LIST OF MEMBERS RELATED TO THE STUDY

A. Team Members

Mitsuru YOSHIKAWA	Team Leader
Hisao ANDO	Deputy Team Leader/ Senior Hydrogeologist
Kosei HASHIGUCHI	Meteo-Hydrologist
Masahiro YAMADA	Irrigation Engineer (Phase I)
Ikuzo IWAMOTO	Irrigation Engineer (Phase II)
Kensuke IRIYA	Agro-economist
Ryoichi KAWASAKI	Groundwater Development Specialist
Mitsuyoshi SAITO	Hydrogeologist
Kenji MATSUZAKI	Drilling Superintendent

B. Counterpart Personnel

Mr. S.B.S. KANSAKAR	Senior Divisional Geologist, DOI
Dr. P. ADHIKARI	Acting Senior Divisional Geologist, DOI
Mr. N.R. SHRESTHA	Divisional Geologist, DOI
Mr. M.S. HADA	Divisional Geologist, DOI
Mr. B.B. RAWAL	Agro-economist, DOI
Mr. M.P. BARAL	Assistant Engineer, DOI
Mr. S.B. BISHT	Assistant Engineer, DOI
Mr. N. SHAKYA	Geologist, DOI
Mr. N.R. TIMILSINA	Driller, DOI

C. Advisory Committee

Chairman

Dr. Masayuki WADA	Ministry of Agriculture, Forestry and Fisheries
Dr. Toshio SUGAWARA	Ministry of Agriculture, Forestry and Fisheries
Mr. Yoshio MIYAJIMA	Ministry of Agriculture, Forestry and Fisheries

MEMBER

Mr. Takasi TACHIBANA	Water Resources Development Public Corporation
Mr. Kiyoshi SAWADA	Ministry of Agriculture, Forestry and Fisheries
Mr. Shinsuke YUASA	Ministry of Agriculture, Forestry and Fisheries
Mr. Akira NAGATA	Ministry of Agriculture, Forestry and Fisheries
Ms. Kuniko ISHIKAWA	Ministry of Agriculture, Forestry and Fisheries

APPENDIX - SEVEN

BIBLIOGRAPHY

APPENDIX SEVEN: BIBLIOGRAPHY

CBS, HMGN (1993): STATISTICAL YEAR BOOK OF NEPAL, 1993

CBS, NPC (1986): A STUDY ON THE IMPROVEMENT OF THE NATIONAL SAMPLECENSUS OF AGRICULTURE IN NEPAL

NPC, HMGN (1991): Nepal in Figure, 1991

NPC, HMGN (1989): Program for the Fulfillment of Basic Needs (1985-2000)

NPC, HMGN (1985): The Seventh Plan, 1985-1990 (Summary), Part-I

ASD, HMGN (1993): AGRICULTURAL STATISTICS OF NEPAL, 1992/93

ASD, HMGN (1991): ECONOMIC SURVEY, FISCAL YEAR 1990-1991

ASD, HMGN (1990): AGRICULTURAL STATISTICS OF NEPAL, 1990

HMGN (1993): Economic Survey Fiscal Year, 1992-93

Center for Research Team (1988): DEVELOPMENT ATLAS OF NEPAL, STATISTICAL PROFILE

National Council for Science and Technology (1980): ATLAS OF ECONOMIC DEVELOPMENT

National Planning Commission Secretariat, NPC (1983): POLICY APPROACH TO DEVELOPMENT ISSUES

Department of Mines and Geology (1990): Exploration Opportunities in Nepal

National Remote Sensing Center (1986): Planimetric Map of Satellite Images 1:250,000 - Dhankuta, Janakpur and Nepalganj

C.K. SHARMA (1990): GEOLOGY OF NEPAL AND ADJACENT COUNTRIES

R.K. PANDAY (1987): ALTITUDE GEOGRAPHY, GEOGRAPHY OF NEPAL

C.K. SHARMA (1981): Ground Water Resources of Nepal

C.K. SHARMA (1977): RIVER SYSTEMS OF NEPAL

S.H. SHRESTHA (1989): NEPAL IN MAPS

GWRDB/GWDP (1979): Groundwater Resources Investigation in the Bheri Zone, Far Western, Terai

GWRDB/GWDP (1987): Groundwater Resources Investigation in Mahottari District

GWRDB (1989): Tubewell Irrigation Project, Jhapa (Tentative Draft)

GWRDB (1990): Sunsari-Morang-Jhapa Tubewell Irrigation Project, Feasibility Report

GWRDB (1990): Feasibility Report of the Mahottari Deep Tubewell Irrigation Project, Mahottari

UNDP/WORLD BANK (1991): IRRIGATION SECTOR SUPPORT PROJECT NEP/89/90/006

SHANTIPUR-JAMUNI DTW IRRIGATION PROJECT, BARDIYA

UNDP (1989): Shallow Groundwater in Investigations in Terai, Technical Report No.15, Mahottari District.

UNDP (1990): Shallow Groundwater in Investigations in Terai, Technical Report No.16, Jhapa District.

UNDP (1990): Shallow Groundwater in Investigations in Terai, Technical Report No.19, Banke District.

UNDP (1990): Shallow Groundwater in Investigations in Terai, Technical Report No.25, Bardiya District.

MOWR,HMGN (1986): WATER USE INVENTORY STUDY FOR JHAPA DISTRICT Volume I: FINAL REPORT.

MOWR, HMGN (1987): WATER USE INVENTORY STUDY FOR MAHOTTARI DISTRICT, Vol.I FINAL REPORT.

MOWR, HMGN (1987): WATER USE INVENTORY STUDY FOR BANKE DISTRICT, FINAL REPORT.

MOWR, HMGN (1985): WATER USE INVENTORY STUDY FOR BARDIYA DISTRICT, FINAL REPORT

Groundwater Development Consultants (1987):
Study of Groundwater Development Strategies for Irrigation in the Terai, Vol. 1, Main Report, Vol. 3, Groundwater, Vol. 6 Maps

Canadian International Water and Energy Consultants (1990):
Master Plan for Irrigation Development in Nepal, Cycle 2, Main Report, Annexes Vol. 1 to 4

JICA (1987): BASIC STUDY REPORT ON TERAI GROUNDWATER DEVELOPMENT PROJECT IN THE KINGDOM OF NEPAL

MAPS

<General>

NEPAL, 1:2,000,000.-, Administrative Map

NEPAL, 1:750,000.-

NEPAL, 1:500,000.-, LANDSAT IMAGERY MAP

<District Map>

JHAPA, 1:125,000.-

MAHOTTARI, 1:125,000.-

BANKE, 1:125,000.-

BARDIYA, 1:125,000.-

DAN DEUKHURI, 1:125,000.-

<Topo-Sheet>

Jhapa area- 1:50,000.-

78B/1, 78B/2, 72N/10, 72N/11, 72N/14, 72N/15

Mahottari area- 1:50,000.-

72E/12, 72E/16, 72F/9, 72F/13, 72F/14

Banke,Bardiya area- 1:50,000.-

62H/7, 62H/8, 62H/11, 62H/12, 62H/16, 63E/9, 63E/13

<Geological Map>

GEOLOGICAL MAP OF NEPAL, 1:1,000,000.-, (1985)

GEOLOGICAL MAP OF FAR WESTERN NEPAL, 1:250,000.- (1987)

GEOLOGICAL MAP OF WESTERN NEPAL, 1:250,000.- (1987)

GEOLOGICAL MAP OF CENTRAL WESTERN NEPAL, 1:250,000.- (1984)

GEOLOGICAL MAP OF CENTRAL NEPAL, 1:250,000.- (1984)

GEOLOGICAL MAP OF EASTERN NEPAL, 1:250,000.- (1984)

1:125,000.- GEOLOGICAL MAP around Jhapa area

1:125,000.- GEOLOGICAL MAP around Mahottari area

1:125,000.- GEOLOGICAL MAP around Banke/Bardiya areas

<Others>

LAND UTILIZATION MAP, 1:50,000.-

around Jhapa, Mahottari, Banke/Bardiya areas

LAND CAPABILITY MAP, 1:50,000.-

around Jhapa, Mahottari, Banke/Bardiya areas

LAND CLASSIFICATION MAP, 1:50,000.-

around Jhapa, Mahottari, Banke/Bardiya areas