

The results of study for the period of 28 years are presented in TABLE E1-2 to TABLE E1-8. FIGURE E1-3 indicates the Malinao reservoir area and capacity curve.

1.3.2 Optimum Size of Phase I Main Canal Capacity

To analyze the optimum size of Phase I main canal capacity, water balance study with the main canal capacity of 7.0 cu.m/sec to 13.0 cu.m/sec was made based on the following conditions;

Inflow to reservoir: Daily runoff discharge
 Water requirements : 10-day water requirements with 160 percent of cropping intensity

The surplus amount of water in the dry year, which gives the influence to the required storage capacity of the Bayongan dam is summarized as shown below, and their details are shown in TABLE E1-9 to TABLE E1-15.

Surplus Water by Different Main Canal Capacity in Dry Year

(Unit: MCM)

<u>Dry Year</u>	<u>7 cu.m /sec</u>	<u>8 cu.m /sec</u>	<u>9 cu.m /sec</u>	<u>10 cu.m /sec</u>	<u>11 cu.m /sec</u>	<u>11.8 cu.m /sec</u>	<u>13 cu.m /sec</u>
1957-58	19.8	21.0	22.0	22.8	23.4	23.8	24.3
1958-59	28.0	29.6	30.8	31.9	32.9	33.7	34.8
1959-60	28.3	30.2	31.8	33.2	34.3	35.1	36.3
1967-68	23.6	25.2	26.6	27.9	29.0	29.7	30.6
1968-69	21.3	22.6	23.8	24.9	25.7	26.3	26.8
1982-83	28.1	30.1	31.7	32.9	34.0	34.8	35.6
Average	24.9	26.5	27.8	29.0	29.9	30.6	31.4
<u>Difference</u>	<u>1.6</u>	<u>1.3</u>	<u>1.2</u>	<u>0.9</u>	<u>0.7</u>	<u>0.8</u>	

1.3.3 Surplus Water

Surplus water from the Phase I project to Phase II project was estimated with the following considerations;

- i) Diverting water from the Malinao damsite in the Wahig river is estimated based on the maximum diverting capacity of 11.8 cu.m/sec and the daily basis.
- ii) Water demand for irrigation in Phase I project is estimated on the basis of paddy cultivation with 160% cropping intensity in the dry year with return period of 1/5 year.
- iii) Surplus Water = Diverting Water (i) - Water demand (ii)

Following Table shows the results of water balance study indicating inflow, surplus water and spillage at the Malinao damsite, and their details are presented in TABLE E1-16.

Surplus Water to Phase II Area

(Unit: MCM)

<u>Yaer</u>	<u>Inflow</u>	<u>Surplus</u>	<u>Spillage</u>
1956-57	154.863	61.438	41.630
1957-58	82.539	23.815	7.102
1958-59	93.277	33.697	7.878
1959-60	102.310	35.144	15.308
1960-61	105.817	46.071	8.033
1961-62	127.738	58.516	17.448
1962-63	145.489	69.986	24.854
1963-64	107.888	42.222	13.833
1964-65	170.697	64.425	55.313
1965-66	96.303	38.862	6.523
1966-67	120.092	52.912	15.593
1967-68	89.151	29.693	7.711
1968-69	97.590	26.229	20.011
1969-70	99.041	41.951	5.288
1970-71	138.153	73.293	13.073
1971-72	132.374	59.325	21.915
1972-73	102.780	35.400	15.872
1973-74	131.711	51.359	28.733
1974-75	133.290	61.803	19.751
1975-76	99.228	38.916	8.728
1976-77	115.904	52.280	11.864
1977-78	127.288	54.757	22.487
1978-79	103.704	41.962	10.078
1979-80	119.475	52.996	14.504
1980-81	128.923	63.825	14.712
1981-82	131.176	56.660	22.737
1982-83	92.566	34.825	6.800
1983-84	124.810	69.011	5.181
<u>Average</u>	<u>116.935</u>	<u>48.977</u>	<u>16.534</u>

TABLE E1-2 SUMMARY OF WATER OPERATION STUDY FOR RPASE I AREA

Description	Alternative - I			Alternative - II		
	I - 1	I - 2	I - 3	II - 1	II - 2	II - 3
1. Cropping Intensity (%)						
Wet Season (May to Oct.)	100	100	100	50	60	70
Dry Season (Oct. to Mar.)	50	60	70	100	100	100
2. Cropping Area (ha)						
Wet Season	4,960	4,960	4,960	2,480	2,980	3,470
Dry Season	2,480	2,980	3,470	4,960	4,960	4,960
3. Runoff at Malinao Dam (MCM)						
Annual Average	116.9	116.9	116.9	116.9	116.9	116.9
Dry Year Average	92.2	92.2	92.2	92.2	92.2	92.2
4. Water Requirements (MCM)						
Wet Season (572.3 mm/ha)	45.5	49.0	52.4	48.5	51.4	54.2
Dry Season (691.2 mm/ha)	28.4	28.4	28.4	14.2	17.1	19.9
5. Water Shortage						
Number of Shortage Year (Times)	6	6	8	11	11	11
Annual Shortage Amount (MCM)	1.0	1.0	1.1	3.2	3.2	3.2

Note: Detail operation result is shown in TABLE E1-3 to TABLE E1-8.

TABLE EI-3 SUMMARY TABLE OF RESERVOIR OPERATION FOR MALINAO DAM

(CASE I-I: 150%)

* RESERVOIR CAPACITY 5.99 (MCM)
 * MAIN CANAL CAPACITY 11.82 (CU.M/S)

YEAR	INFLOW (MCM)	DEMAND (MCM)	BALANCE (MCM)	EVAPORAT. (MCM)	REMAIN (MCM)	INTAKE (MCM)	BAYONGAN (MCM)	SPILLAGE (MCM)	SHORTAGE (MCM)
56-57	154.863	45.526	109.335	2.821	106.514	109.817	64.290	42.224	0.0
57-58	82.539	45.526	37.012	2.661	34.352	71.865	26.339	8.014	0.0
58-59	93.277	45.526	47.750	2.744	45.007	81.681	36.155	8.852	0.0
59-60	102.310	45.666	56.642	2.718	53.924	84.091	38.424	15.500	0.0
60-61	105.817	45.526	60.290	2.751	57.539	94.923	49.396	8.143	0.0
61-62	127.738	45.526	82.211	2.797	79.414	106.714	61.187	18.227	0.0
62-63	145.489	45.526	99.961	2.679	98.291	117.955	73.437	24.854	-1.008
63-64	107.888	45.666	62.221	2.693	59.528	91.092	45.425	14.103	0.0
64-65	170.697	45.526	125.169	2.660	123.191	112.614	67.769	55.422	-0.682
65-66	96.303	45.526	50.776	2.663	48.815	87.116	42.292	6.523	-0.702
66-67	120.092	45.526	74.565	2.609	71.956	101.807	56.281	15.676	0.0
67-68	89.151	45.666	43.483	2.613	40.871	78.827	33.160	7.711	0.0
68-69	97.590	45.526	52.062	2.597	49.657	73.994	28.633	21.024	-0.165
69-70	99.041	45.526	53.513	2.802	50.687	90.685	45.159	5.528	0.0
70-71	138.153	45.526	92.626	2.813	89.813	122.129	76.602	13.211	0.0
71-72	132.374	45.666	86.706	2.646	84.711	107.813	62.796	21.915	-0.649
72-73	102.780	45.526	57.252	2.650	54.603	83.934	38.408	16.195	0.0
73-74	131.711	45.526	86.184	2.645	83.539	99.685	54.158	29.381	0.0
74-75	133.290	45.526	87.762	2.756	85.006	110.366	64.839	20.167	0.0
75-76	99.228	45.666	53.561	2.735	51.121	86.915	41.544	9.578	-0.295
76-77	115.904	45.526	70.377	2.784	67.594	100.735	55.208	12.385	0.0
77-78	127.288	45.526	81.760	2.585	80.691	101.311	57.299	23.392	-1.515
78-79	103.704	45.526	58.177	2.727	55.450	90.770	45.243	10.207	0.0
79-80	119.475	45.666	73.807	2.839	70.968	101.767	56.101	14.868	0.0
80-81	128.923	45.526	83.395	2.529	81.992	111.682	67.280	14.712	-1.125
81-82	131.176	45.526	85.648	2.802	82.847	105.637	60.110	22.737	0.0
82-83	92.566	45.526	47.039	2.583	44.456	83.182	37.656	6.800	0.0
83-84	124.810	45.666	79.142	2.563	77.674	117.065	72.494	5.181	-1.095
AVE.	116.935	45.561	71.372	2.695	68.936	97.363	52.060	16.876	-0.258

TABLE E1-4 SUMMARY TABLE OF RESERVOIR OPERATION FOR MALINAO DAM

(CASE I-2: 160%)

* RESERVOIR CAPACITY 5.99 (MCM)
 * MAIN CANAL CAPACITY 11.82 (CU.M/S)

YEAR	INFLOW (MCM)	DEMAND (MCM)	BALANCE (MCM)	EVAPORAT. (MCM)	REMAIN (MCM)	INTAKE (MCM)	BAYONGAN (MCM)	SPILLAGE (MCM)	SHORTAGE (MCM)
56-57	154.863	48.982	105.879	2.812	103.068	110.421	61.438	41.630	0.0
57-58	82.539	48.982	33.556	2.639	30.918	72.798	23.816	7.102	0.0
58-59	93.277	48.982	44.294	2.719	41.576	82.680	33.698	7.878	0.0
59-60	102.310	49.150	53.158	2.707	50.452	84.295	35.144	15.308	0.0
60-61	105.817	48.982	56.834	2.732	54.102	95.052	46.070	8.033	0.0
61-62	127.738	48.982	78.755	2.791	75.964	107.499	58.516	17.448	0.0
62-63	145.489	48.982	96.505	2.675	94.839	117.959	69.985	24.854	-1.008
63-64	107.888	49.150	58.737	2.682	56.055	91.373	42.222	13.833	0.0
64-65	170.697	48.982	121.713	2.659	119.054	112.725	64.424	55.313	-0.682
65-66	96.303	48.982	47.320	2.637	44.683	87.143	38.863	6.523	-0.702
66-67	120.092	48.982	71.109	2.605	68.504	101.894	52.911	15.593	0.0
67-68	89.151	49.150	39.999	2.596	37.404	78.844	29.693	7.711	0.0
68-69	97.590	48.982	48.606	2.557	46.049	75.046	26.230	20.011	-0.165
69-70	99.041	48.982	50.058	2.793	47.265	90.934	41.952	5.288	0.0
70-71	138.153	48.982	89.170	2.806	86.364	122.274	73.291	13.073	0.0
71-72	132.374	49.150	83.222	2.634	81.238	107.825	59.323	21.915	-0.649
72-73	102.780	48.982	53.796	2.527	51.271	84.381	35.399	15.872	0.0
73-74	131.711	48.982	82.728	2.638	80.091	100.341	51.358	28.733	0.0
74-75	133.290	48.982	84.306	2.754	81.553	110.785	61.802	19.751	0.0
75-76	99.228	49.150	50.076	2.728	47.348	87.771	38.916	8.728	-0.295
76-77	115.904	48.982	66.921	2.778	64.143	101.262	52.279	11.864	0.0
77-78	127.288	48.982	78.304	2.575	77.244	102.225	54.757	22.487	-1.515
78-79	103.704	48.982	54.721	2.682	52.040	90.944	41.961	10.078	0.0
79-80	119.475	49.150	70.323	2.824	67.500	102.147	52.996	14.504	0.0
80-81	128.923	48.982	79.939	2.528	78.537	111.683	63.825	14.712	-1.125
81-82	131.176	48.982	82.192	2.797	79.396	105.642	56.660	22.737	0.0
82-83	92.566	48.982	43.583	2.276	41.307	83.490	34.824	6.800	-0.316
83-84	124.810	49.150	75.658	2.563	74.191	117.065	69.010	5.181	-1.095
AVE.	116.935	49.024	67.909	2.668	65.511	97.732	48.977	16.534	-0.270

TABLE EI-5

SUMMARY TABLE OF RESERVOIR OPERATION FOR MALINAO DAM

(CASE I-3: 170%)

YEAR	INFLOW (MCM)	DEMAND (MCM)	BALANCE (MCM)	EVAPORAT. (MCM)	REMAIN (MCM)	INTAKE (MCM)	BAYONGAN (MCM)	SPILLAGE (MCM)	SHORTAGE (MCM)
56-57	154.863	52.369	102.493	2.801	99.692	110.749	58.380	41.313	0.0
57-58	82.539	52.369	30.170	2.606	27.564	73.501	21.132	6.432	0.0
58-59	93.277	52.369	40.907	2.677	38.231	83.468	31.099	7.133	0.0
59-60	102.310	52.565	49.744	2.691	47.053	84.379	31.814	15.239	0.0
60-61	105.817	52.369	53.447	2.702	50.746	95.199	42.830	7.916	0.0
61-62	127.738	52.369	75.368	2.784	72.585	108.462	56.093	16.492	0.0
62-63	145.489	52.369	93.119	2.670	91.458	117.994	66.633	24.825	-1.008
63-64	107.888	52.565	55.322	2.667	52.656	91.794	39.229	13.427	0.0
64-65	170.697	52.369	118.326	2.656	116.352	112.866	61.178	55.174	-0.682
65-66	96.303	52.369	43.934	2.593	42.043	87.187	35.520	6.523	-0.702
66-67	120.092	52.369	67.722	2.600	65.122	102.223	49.854	15.269	0.0
67-68	89.151	52.565	36.585	2.557	34.029	78.883	26.319	7.711	0.0
68-69	97.590	52.369	45.219	2.510	42.901	75.395	23.191	19.710	-0.165
69-70	99.041	52.369	46.671	2.773	43.873	91.600	39.231	4.642	0.0
70-71	138.153	52.369	85.783	2.794	82.989	122.444	70.074	12.915	0.0
71-72	132.374	52.565	79.808	2.609	77.849	108.614	56.698	21.151	-0.649
72-73	102.780	52.369	50.410	2.363	48.403	85.150	33.136	15.267	-0.356
73-74	131.711	52.369	79.341	2.624	76.717	100.832	48.463	28.255	0.0
74-75	133.290	52.369	80.919	2.750	78.170	111.424	59.055	19.115	0.0
75-76	99.228	52.565	46.662	2.717	44.240	88.548	36.278	7.963	-0.295
76-77	115.904	52.369	63.534	2.772	60.762	101.394	49.025	11.738	0.0
77-78	127.288	52.369	74.917	2.561	73.872	102.504	51.650	22.223	-1.515
78-79	103.704	52.369	51.334	2.608	48.727	91.018	38.648	10.078	0.0
79-80	119.475	52.565	66.908	2.801	64.108	102.539	49.973	14.134	0.0
80-81	128.923	52.369	76.552	2.525	75.153	111.685	60.441	14.712	-1.125
81-82	131.176	52.369	78.806	2.787	76.020	105.809	53.440	22.580	0.0
82-83	92.566	52.369	40.196	2.127	40.627	83.639	33.828	6.800	-2.558
83-84	124.810	52.565	72.243	2.562	70.777	117.067	65.596	5.181	-1.095
AVE.	116.935	52.418	64.516	2.639	62.240	98.084	46.029	16.211	-0.363

TABLE EI-6

SUMMARY TABLE OF RESERVOIR OPERATION FOR MALINAO DAM

(CASE II-1: 150%)

* RESERVOIR CAPACITY 5.99 (MCM)
 * MAIN CANAL CAPACITY 11.82 (CU.M/S)

YEAR	INFLOW (MCM)	DEMAND (MCM)	BALANCE (MCM)	EVAPORAT. (MCM)	REMAIN (MCM)	INTAKE (MCM)	BAYONGAN (MCM)	SPILLAGE (MCM)	SHORTAGE (MCM)
56-57	154.863	48.474	106.387	2.760	103.627	110.732	62.257	41.370	0.0
57-58	82.539	48.474	34.064	2.399	34.578	72.425	26.863	7.715	-2.913
58-59	93.277	48.474	44.802	2.506	44.509	83.394	37.132	7.378	-2.213
59-60	102.310	48.755	53.554	2.656	50.898	83.375	34.620	16.278	0.0
60-61	105.817	48.474	57.342	2.586	54.757	91.334	42.859	11.898	0.0
61-62	127.738	48.474	79.262	2.797	76.466	107.761	59.286	17.180	0.0
62-63	145.489	48.474	97.012	2.795	94.218	117.794	69.318	24.900	0.0
63-64	107.888	48.755	59.132	2.588	58.444	90.694	43.840	14.605	-1.900
64-65	170.697	48.474	122.220	2.814	119.407	111.643	63.168	56.239	0.0
65-66	96.303	48.474	47.828	2.475	48.909	85.236	40.317	8.592	-3.556
66-67	120.092	48.474	71.616	2.788	68.829	103.038	54.563	14.266	0.0
67-68	89.151	48.755	40.396	2.372	39.423	76.103	28.747	10.676	-1.399
68-69	97.590	48.474	49.113	2.570	51.304	75.930	32.215	19.089	-4.760
69-70	99.041	48.474	50.566	2.522	48.088	91.115	42.685	5.404	-0.044
70-71	138.153	48.474	89.677	2.662	87.015	123.215	74.740	12.276	0.0
71-72	132.374	48.755	83.618	2.675	80.943	109.964	61.209	19.734	0.0
72-73	102.780	48.474	54.305	2.359	57.994	84.252	41.825	16.169	-6.048
73-74	131.711	48.474	83.235	2.771	80.541	102.889	54.490	26.051	-0.077
74-75	133.290	48.474	84.814	2.814	82.000	109.955	61.480	20.520	0.0
75-76	99.228	48.755	50.472	2.747	47.725	87.693	38.938	8.787	0.0
76-77	115.904	48.474	67.428	2.799	64.629	101.540	53.065	11.564	0.0
77-78	127.288	48.474	78.812	2.694	76.118	105.333	56.858	19.260	0.0
78-79	103.704	48.474	55.229	2.406	55.490	90.480	44.672	10.818	-2.668
79-80	119.475	48.755	70.719	2.687	68.032	105.011	56.256	11.776	0.0
80-81	128.923	48.474	80.447	2.782	77.665	111.160	62.685	14.980	0.0
81-82	131.176	48.474	82.700	2.767	79.933	103.610	55.135	24.799	0.0
82-83	92.566	48.474	44.091	2.006	52.125	83.540	45.106	7.019	-10.041
83-84	124.810	48.755	76.053	2.837	73.216	113.050	64.294	8.923	0.0
AVE.	116.935	48.544	68.389	2.630	67.031	97.581	50.308	16.724	-1.272

TABLE EI-7 SUMMARY TABLE OF RESERVOIR OPERATION FOR MALINAO DAM

(CASE II-2: 160%)

YEAR	INFLOW (MCM)	DEMAND (MCM)	BALANCE (MCM)	EVAPORAT. (MCM)	REMAIN (MCM)	INTAKE (MCM)	BAYONGAN (MCM)	SPILLAGE (MCM)	SHORTAGE (MCM)
56-57	154.863	51.336	103.525	2.757	100.769	110.944	59.607	41.161	0.0
57-58	82.539	51.336	31.203	2.390	31.726	72.488	24.065	7.662	-2.913
58-59	93.277	51.336	41.941	2.496	41.657	83.570	34.447	7.210	-2.213
59-60	102.310	51.616	50.692	2.643	48.050	84.239	32.623	15.427	0.0
60-61	105.817	51.336	54.481	2.575	51.906	92.124	40.788	11.118	0.0
61-62	127.738	51.336	76.401	2.791	73.610	107.767	56.430	17.180	0.0
62-63	145.489	51.336	94.151	2.782	91.369	117.813	66.476	24.893	0.0
63-64	107.888	51.616	56.271	2.575	55.596	91.463	41.746	13.850	-1.900
64-65	170.697	51.336	119.359	2.792	116.567	111.853	60.516	56.051	0.0
65-66	96.303	51.336	44.967	2.465	46.057	85.440	37.659	8.398	-3.556
66-67	120.092	51.336	68.755	2.773	65.982	103.578	52.241	13.741	0.0
67-68	89.151	51.616	37.534	2.352	36.581	76.456	26.239	10.343	-1.399
68-69	97.590	51.336	46.252	2.556	48.457	75.945	29.368	19.089	-4.760
69-70	99.041	51.336	47.704	2.517	45.231	91.426	40.134	5.097	-0.044
70-71	138.153	51.616	86.816	2.660	84.156	123.364	72.027	12.129	0.0
71-72	132.374	51.336	80.756	2.650	78.106	109.989	58.372	19.734	0.0
72-73	102.780	51.336	51.444	2.351	55.141	84.260	38.972	16.169	-6.048
73-74	131.711	51.336	80.374	2.762	77.689	103.087	51.827	25.862	-0.077
74-75	133.290	51.336	81.952	2.806	79.146	110.413	59.077	20.070	0.0
75-76	99.228	51.616	47.611	2.738	44.873	87.938	36.321	8.552	0.0
76-77	115.904	51.336	64.567	2.796	61.771	101.551	50.214	11.557	0.0
77-78	127.288	51.336	75.950	2.657	73.294	105.558	54.222	19.072	0.0
78-79	103.704	51.336	52.367	2.401	52.634	90.485	41.816	10.818	-2.668
79-80	119.475	51.616	67.858	2.686	65.171	105.011	53.395	11.776	0.0
80-81	128.923	51.336	77.585	2.746	74.840	111.197	59.860	14.980	0.0
81-82	131.176	51.336	79.838	2.762	77.077	104.069	52.733	24.344	0.0
82-83	92.566	51.336	41.229	1.990	49.280	83.602	42.307	6.973	-10.041
83-84	124.810	51.616	73.192	2.828	70.364	113.059	61.441	8.923	0.0
AVE.	116.935	51.406	65.528	2.618	64.182	97.810	47.676	16.506	-1.272

TABLE E1-8

SUMMARY TABLE OF RESERVOIR OPERATION FOR MALINAO DAM

(CASE II-3: 170%)

* RESERVOIR CAPACITY 5.99 (MCM)
 * MAIN CANAL CAPACITY 11.82 (CU.M/S)

YEAR	INFLOW (MCM)	DEMAND (MCM)	BALANCE (MCM)	EVAPORAT. (MCM)	REMAIN (MCM)	INTAKE (MCM)	BAYONGAN (MCM)	SPILLAGE (MCM)	SHORTAGE (MCM)
56-57	154.863	54.140	100.721	2.753	97.968	111.381	57.240	40.729	0.0
57-58	82.539	54.140	28.399	2.372	28.939	72.583	21.355	7.584	-2.913
58-59	93.277	54.140	39.136	2.485	38.864	84.251	32.323	6.541	-2.213
59-60	102.310	54.421	47.888	2.628	45.261	85.063	30.642	14.619	0.0
60-61	105.817	54.140	51.676	2.563	49.114	92.696	38.555	10.559	0.0
61-62	127.738	54.140	73.597	2.783	70.813	108.315	54.174	16.639	0.0
62-63	145.489	54.140	91.347	2.766	88.581	118.157	64.016	24.565	0.0
63-64	107.888	54.421	53.467	2.557	52.810	92.555	40.034	12.776	-1.900
64-65	170.697	54.140	116.555	2.763	113.792	112.967	58.825	54.967	0.0
65-66	96.303	54.140	42.162	2.443	43.275	86.023	35.439	7.837	-3.556
66-67	120.092	54.140	65.950	2.745	63.206	104.287	50.146	13.060	0.0
67-68	89.151	54.421	34.730	2.330	33.799	76.731	23.709	10.091	-1.399
68-69	97.590	54.140	43.448	2.530	45.679	75.970	26.590	19.089	-4.760
69-70	99.041	54.140	44.900	2.512	42.433	91.849	37.753	4.680	-0.044
70-71	138.153	54.140	84.011	2.657	81.355	123.367	69.226	12.129	0.0
71-72	132.374	54.421	77.952	2.618	75.335	110.022	55.600	19.734	0.0
72-73	102.780	54.140	48.639	2.341	52.346	84.269	36.177	16.169	-6.048
73-74	131.711	54.140	77.569	2.748	74.899	103.186	49.122	25.778	-0.077
74-75	133.290	54.140	79.148	2.798	76.350	110.896	56.755	19.596	0.0
75-76	99.228	54.421	44.807	2.723	42.084	88.538	34.117	7.967	0.0
76-77	115.904	54.140	61.762	2.787	58.976	101.843	47.701	11.275	0.0
77-78	127.288	54.140	73.146	2.610	70.536	105.807	51.666	18.870	0.0
78-79	103.704	54.140	49.563	2.394	49.837	90.612	39.139	10.698	-2.668
79-80	119.475	54.421	65.053	2.686	62.368	105.012	50.591	11.776	0.0
80-81	128.923	54.140	74.781	2.692	72.090	111.405	57.264	14.826	0.0
81-82	131.176	54.140	77.034	2.756	74.279	104.767	50.626	23.653	0.0
82-83	92.566	54.140	38.425	1.971	46.494	83.620	39.521	6.973	-10.041
83-84	124.810	54.421	70.388	2.803	67.585	113.550	59.128	8.457	0.0
AVE.	116.935	54.210	62.723	2.600	61.395	98.204	45.265	16.130	-1.272

FIGURE E1-3 MALINAO RESERVOIR AREA AND CAPACITY CURVE

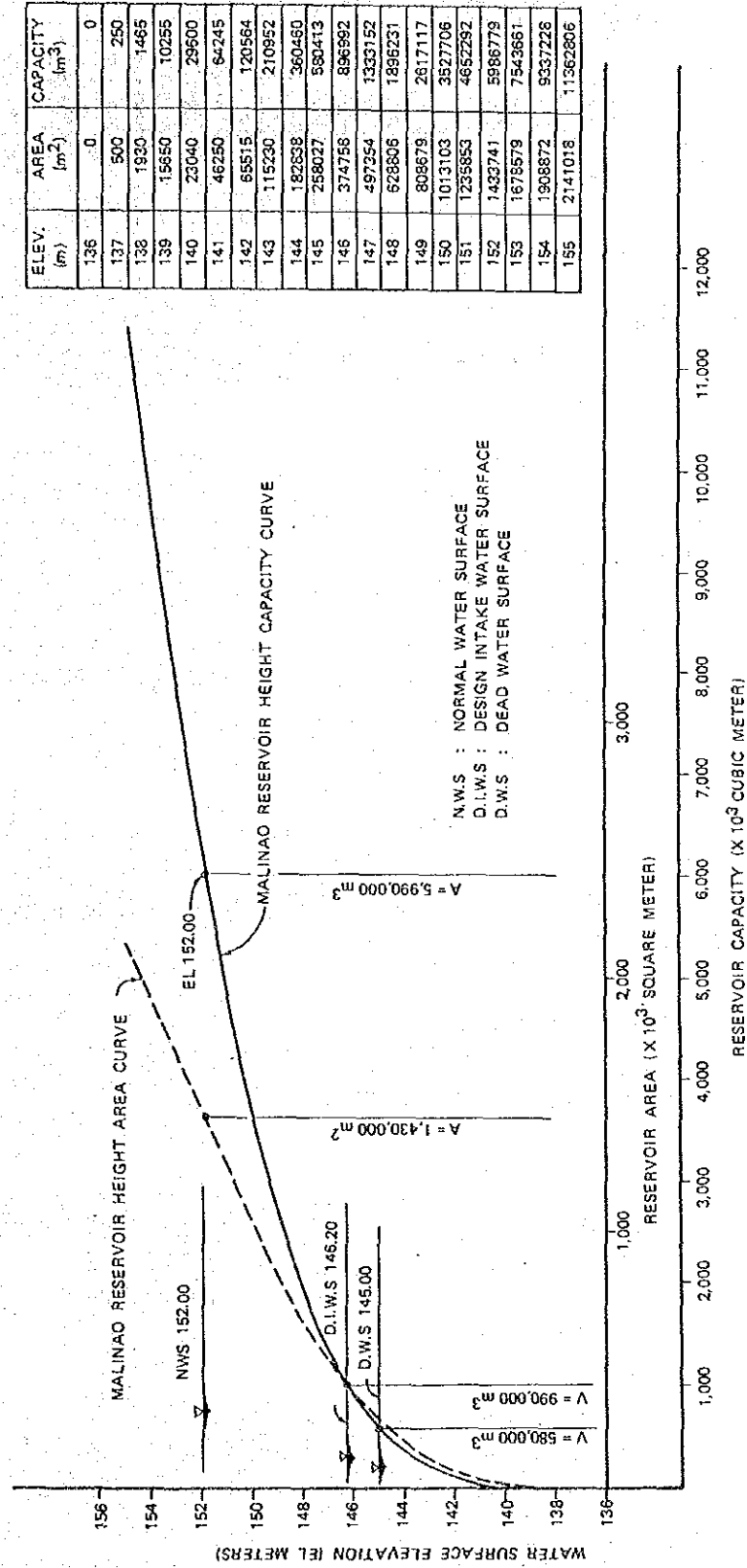


TABLE E1-9

SUMMARY TABLE OF SURPLUS WATER FROM PHASE I AREA

(MAIN CANAL CAPACITY: 7.0 cu.m/sec)

* RESERVOIR CAPACITY 5.99 (MCM)
 * MAIN CANAL CAPACITY 7.00 (CU.M/S)

YEAR	INFLOW (MCM)	DEMAND (MCM)	BALANCE (MCM)	EVAPORAT. (MCM)	REMAIN (MCM)	INTAKE (MCM)	BAYONGAN (MCM)	SPILLAGE (MCM)	SHORTAGE (MCM)
56-57	154.863	48.982	105.879	2.812	103.068	96.924	47.941	55.126	0.0
57-58	82.539	48.982	33.556	2.639	30.918	68.822	19.840	11.078	0.0
58-59	93.277	48.982	44.294	2.719	41.576	77.027	28.045	13.531	0.0
59-60	102.310	49.150	53.158	2.707	50.452	77.451	28.301	22.151	0.0
60-61	105.817	48.982	56.834	2.732	54.102	85.926	36.943	17.159	0.0
61-62	127.738	48.982	78.755	2.791	75.964	95.922	46.939	29.025	0.0
62-63	145.489	48.982	96.505	2.675	94.839	102.675	54.700	40.139	-1.008
63-64	107.888	49.150	58.737	2.682	56.055	84.637	35.487	20.568	0.0
64-65	170.697	48.982	121.713	2.659	119.737	97.452	49.152	70.585	-0.682
65-66	96.303	48.982	47.320	2.637	45.386	80.300	32.020	13.366	-0.702
66-67	120.092	48.982	71.109	2.605	68.504	90.910	41.927	26.577	0.0
67-68	89.151	49.150	39.999	2.596	37.404	72.777	23.627	13.778	0.0
68-69	97.590	48.982	48.606	2.557	46.240	70.158	21.341	24.900	-0.165
69-70	99.041	48.982	50.058	2.793	47.240	83.494	34.512	12.728	0.0
70-71	138.153	48.982	89.170	2.806	86.364	106.811	57.828	28.536	0.0
71-72	132.374	49.150	83.222	2.634	81.238	96.848	48.347	32.891	-0.649
72-73	102.780	48.982	53.796	2.527	51.271	78.246	29.264	22.007	0.0
73-74	131.711	48.982	82.728	2.638	80.091	92.056	43.073	37.018	0.0
74-75	133.290	48.982	84.306	2.754	81.553	100.062	51.080	30.473	0.0
75-76	99.228	49.150	50.076	2.728	47.644	80.079	31.223	16.421	-0.295
76-77	115.904	48.982	66.921	2.778	64.143	90.800	41.818	22.325	0.0
77-78	127.288	48.982	78.304	2.575	77.244	91.668	44.200	33.044	-1.515
78-79	103.704	48.982	54.721	2.682	52.040	83.707	34.725	17.315	0.0
79-80	119.475	49.150	70.323	2.824	67.500	91.710	42.559	24.941	0.0
80-81	128.923	48.982	79.939	2.528	78.537	99.058	51.200	27.337	-1.125
81-82	131.176	48.982	82.192	2.797	79.396	96.276	47.293	32.103	0.0
82-83	92.566	48.982	43.583	2.276	41.623	76.732	28.066	13.557	-0.316
83-84	124.810	49.150	75.658	2.563	74.191	109.210	61.154	13.036	-1.095
AVE.	116.935	49.024	67.909	2.668	65.511	88.490	39.736	25.776	-0.270

TABLE E1-10

SUMMARY TABLE OF SURPLUS WATER FROM PHASE I AREA

(MAIN CANAL CAPACITY: 8.0 cu.m./sec)

YEAR	INFLOW (MCM)	DEMAND (MCM)	BALANCE (MCM)	EVAPORAT. (MCM)	REMAIN (MCM)	INTAKE (MCM)	BAYONGAN (MCM)	SPILLAGE (MCM)	SHORTAGE (MCM)
56-57	154.863	48.982	105.879	2.812	103.068	100.350	51.367	51.700	0.0
57-58	82.539	48.982	33.556	2.639	30.918	69.998	21.016	9.902	0.0
58-59	93.277	48.982	44.294	2.719	41.576	78.557	29.575	12.001	0.0
59-60	102.310	49.150	53.158	2.707	50.452	79.383	30.233	20.219	0.0
60-61	105.817	48.982	56.834	2.732	54.102	88.522	39.540	14.563	0.0
61-62	127.738	48.982	78.755	2.791	75.964	98.772	49.789	26.175	0.0
62-63	145.489	48.982	96.505	2.675	94.839	106.856	58.882	35.957	-1.008
63-64	107.888	49.150	58.737	2.682	56.055	86.579	37.428	18.627	0.0
64-65	170.697	48.982	121.713	2.659	119.737	101.644	53.343	66.394	-0.682
65-66	96.303	48.982	47.320	2.637	45.386	82.102	33.822	11.564	-0.702
66-67	120.092	48.982	71.109	2.605	68.504	93.660	44.677	23.827	0.0
67-68	89.151	49.150	39.999	2.596	37.404	74.312	25.162	12.242	0.0
68-69	97.590	48.982	48.606	2.557	46.240	71.389	22.573	23.668	-0.165
69-70	99.041	48.982	50.058	2.793	47.240	85.745	36.763	10.477	0.0
70-71	138.153	48.982	89.170	2.806	86.364	111.100	62.117	24.247	0.0
71-72	132.374	49.150	83.222	2.634	81.238	100.003	51.501	29.737	-0.649
72-73	102.780	48.982	53.796	2.527	51.271	80.035	31.053	20.218	0.0
73-74	131.711	48.982	82.728	2.638	80.091	94.256	45.273	34.818	0.0
74-75	133.290	48.982	84.306	2.754	81.553	103.161	54.179	27.374	0.0
75-76	99.228	49.150	50.076	2.728	47.644	82.075	33.220	14.424	-0.295
76-77	115.904	48.982	66.921	2.778	64.143	93.667	44.685	19.458	0.0
77-78	127.288	48.982	78.304	2.575	77.244	94.738	47.271	29.974	-1.515
78-79	103.704	48.982	54.721	2.682	52.040	85.669	36.687	15.353	0.0
79-80	119.475	49.150	70.323	2.824	67.500	94.600	45.450	22.050	0.0
80-81	128.923	48.982	79.939	2.528	78.537	102.389	54.531	24.006	-1.125
81-82	131.176	48.982	82.192	2.797	79.396	99.103	50.121	29.276	0.0
82-83	92.566	48.982	43.583	2.276	41.623	78.737	30.071	11.553	-0.316
83-84	124.810	49.150	75.658	2.563	74.191	111.850	63.795	10.396	-1.095
AVE.	116.935	49.024	67.909	2.668	65.511	91.045	42.290	23.221	-0.270

TABLE I-11

SUMMARY TABLE OF SURPLUS WATER FROM PHASE I AREA

(MAIN CANAL CAPACITY: 9.0 cu.m./sec)

* RESERVOIR CAPACITY 5.99 (MCM)
 * MAIN CANAL CAPACITY 9.00 (CU.M/S)

YEAR	INFLOW (MCM)	DEMAND (MCM)	BALANCE (MCM)	EVAPORAT. (MCM)	REMAIN (MCM)	INTAKE (MCM)	BAYONGAN (MCM)	SPILLAGE (MCM)	SHORTAGE (MCM)
56-57	154.863	48.982	105.879	2.812	103.068	103.457	54.474	48.594	0.0
57-58	82.539	48.982	33.556	2.639	30.918	70.968	21.986	8.932	0.0
58-59	93.277	48.982	44.294	2.719	41.576	79.811	30.829	10.747	0.0
59-60	102.310	49.150	53.158	2.707	50.452	80.992	31.842	18.611	0.0
60-61	105.817	48.982	56.834	2.732	54.102	90.787	41.805	12.298	0.0
61-62	127.738	48.982	78.755	2.791	75.964	101.329	52.346	23.618	0.0
62-63	145.489	48.982	96.505	2.675	94.839	110.272	62.298	32.541	-1.008
63-64	107.888	49.150	58.737	2.682	56.055	88.205	39.055	17.000	0.0
64-65	170.697	48.982	121.713	2.659	119.054	105.259	56.958	62.778	-0.682
65-66	96.303	48.982	47.320	2.637	44.683	83.702	35.422	9.964	-0.702
66-67	120.092	48.982	71.109	2.605	68.504	96.173	47.191	21.313	0.0
67-68	89.151	49.150	39.999	2.596	37.404	75.733	26.583	10.821	0.0
68-69	97.590	48.982	48.606	2.557	46.049	72.599	23.782	22.459	-0.165
69-70	99.041	48.982	50.058	2.793	47.265	87.537	38.554	8.685	0.0
70-71	138.153	48.982	89.170	2.806	86.364	114.737	65.754	20.610	0.0
71-72	132.374	49.150	83.222	2.634	80.588	102.572	54.071	27.167	-0.649
72-73	102.780	48.982	53.796	2.527	51.269	81.485	32.503	18.768	0.0
73-74	131.711	48.982	82.728	2.638	80.090	96.293	47.310	32.781	0.0
74-75	133.290	48.982	84.306	2.754	81.552	105.745	56.763	24.790	0.0
75-76	99.228	49.150	50.076	2.728	47.348	83.931	35.075	12.568	-0.295
76-77	115.904	48.982	66.921	2.778	64.143	96.004	47.021	17.121	0.0
77-78	127.288	48.982	78.304	2.575	75.729	97.261	49.793	27.451	-1.515
78-79	103.704	48.982	54.721	2.682	52.039	87.444	38.461	13.578	0.0
79-80	119.475	49.150	70.323	2.824	67.500	97.028	47.877	19.622	0.0
80-81	128.923	48.982	79.939	2.528	77.411	105.231	57.373	21.164	-1.125
81-82	131.176	48.982	82.192	2.797	79.395	101.214	52.231	27.165	0.0
82-83	92.566	48.982	43.583	2.276	41.307	80.359	31.693	9.930	-0.316
83-84	124.810	49.150	75.658	2.563	73.095	113.759	65.703	8.488	-1.095
AVE.	116.935	49.024	67.909	2.668	65.241	93.210	44.455	21.056	-0.270

TABLE E1-12 SUMMARY TABLE OF SURPLUS WATER FROM PHASE I AREA
(MAIN CANAL CAPACITY: 10.0 cu.m./sec)

YEAR	INFLOW (MCM)	DEMAND (MCM)	BALANCE (MCM)	EVAPORAT. (MCM)	REMAIN (MCM)	INTAKE (MCM)	BAYONGAN (MCM)	SPILLAGE (MCM)	SHORTAGE (MCM)
56-57	154.863	48.982	105.879	2.812	103.068	106.271	57.288	45.780	0.0
57-58	82.539	48.982	33.556	2.639	30.918	71.740	22.758	8.160	0.0
58-59	93.277	48.982	44.294	2.719	41.576	80.858	31.876	9.700	0.0
59-60	102.310	49.150	53.158	2.707	50.452	82.328	33.177	17.275	0.0
60-61	105.817	48.982	56.834	2.732	54.102	92.589	43.606	10.496	0.0
61-62	127.738	48.982	78.755	2.791	75.964	103.736	54.753	21.211	0.0
62-63	145.489	48.982	96.505	2.675	94.839	113.344	65.370	29.469	-1.008
63-64	107.888	49.150	58.737	2.682	56.055	89.607	40.456	15.599	0.0
64-65	170.697	48.982	121.713	2.659	119.054	108.200	59.899	59.837	-0.682
65-66	96.303	48.982	47.320	2.637	44.683	85.151	36.872	8.514	-0.702
66-67	120.092	48.982	71.109	2.605	68.504	98.458	49.475	19.029	0.0
67-68	89.151	49.150	39.999	2.596	37.404	77.072	27.922	9.482	0.0
68-69	97.590	48.982	48.606	2.557	46.049	73.697	24.881	21.360	-0.165
69-70	99.041	48.982	50.058	2.793	47.265	89.039	40.057	7.183	0.0
70-71	138.153	48.982	89.170	2.806	86.364	117.829	68.846	17.518	0.0
71-72	132.374	49.150	83.222	2.634	80.588	104.575	56.073	25.165	-0.649
72-73	102.780	48.982	53.796	2.527	51.269	82.695	33.713	17.559	0.0
73-74	131.711	48.982	82.728	2.638	80.090	98.005	49.023	31.068	0.0
74-75	133.290	48.982	84.306	2.754	81.552	107.928	58.945	22.608	0.0
75-76	99.228	49.150	50.076	2.728	47.348	85.507	36.651	10.993	-0.295
76-77	115.904	48.982	66.921	2.778	64.143	98.133	49.150	14.992	0.0
77-78	127.288	48.982	78.304	2.575	75.729	99.293	51.825	25.419	-1.515
78-79	103.704	48.982	54.721	2.682	52.039	88.881	39.898	12.142	0.0
79-80	119.475	49.150	70.323	2.824	67.500	99.045	49.894	17.605	0.0
80-81	128.923	48.982	79.939	2.528	77.411	107.793	59.935	18.602	-1.125
81-82	131.176	48.982	82.192	2.797	79.395	102.917	53.935	25.462	0.0
82-83	92.566	48.982	43.583	2.276	41.307	81.587	32.920	8.703	-0.316
83-84	124.810	49.150	75.658	2.563	73.095	115.281	67.225	6.966	-1.095
AVE.	116.935	49.024	67.909	2.668	65.241	95.056	46.301	19.211	-0.270

TABLE E1-13

SUMMARY TABLE OF SURPLUS WATER FROM PHASE I AREA

(MAIN CANAL CAPACITY: 11.0 cu.m/sec)

* RESERVOIR CAPACITY 5.99 (MCM)

* MAIN CANAL CAPACITY 11.00 (CU.M/S)

YEAR	INFLOW (MCM)	DEMAND (MCM)	BALANCE (MCM)	EVAPORAT. (MCM)	REMAIN (MCM)	INTAKE (MCM)	BAYONGAN (MCM)	SPILLAGE (MCM)	SHORTAGE (MCM)
56-57	154.863	48.982	105.879	2.812	103.068	108.633	59.650	43.418	0.0
57-58	82.539	48.982	33.556	2.639	30.918	72.372	23.391	7.527	0.0
58-59	93.277	48.982	44.294	2.719	41.576	81.894	32.912	8.664	0.0
59-60	102.310	49.150	53.158	2.707	50.452	83.444	34.294	16.158	0.0
60-61	105.817	48.982	56.834	2.732	54.102	94.058	45.075	9.027	0.0
61-62	127.738	48.982	78.755	2.791	75.964	105.845	56.863	19.101	0.0
62-63	145.489	48.982	96.505	2.675	94.839	116.091	68.116	26.723	-1.008
63-64	107.888	49.150	58.737	2.682	56.055	90.671	41.520	14.535	0.0
64-65	170.697	48.982	121.713	2.659	119.737	110.825	62.524	57.212	-0.682
65-66	96.303	48.982	47.320	2.637	45.386	86.407	38.128	7.258	-0.702
66-67	120.092	48.982	71.109	2.605	68.504	100.444	51.462	17.042	0.0
67-68	89.151	49.150	39.999	2.596	37.404	78.134	28.984	8.420	0.0
68-69	97.590	48.982	48.606	2.557	46.240	74.549	25.732	20.509	-0.165
69-70	99.041	48.982	50.058	2.793	47.240	90.196	41.214	6.026	0.0
70-71	138.153	48.982	89.170	2.806	86.364	120.372	71.389	14.975	0.0
71-72	132.374	49.150	83.222	2.634	81.238	106.457	57.955	23.283	-0.649
72-73	102.780	48.982	53.796	2.527	51.271	83.722	34.740	16.531	0.0
73-74	131.711	48.982	82.728	2.638	80.091	99.401	50.419	29.672	0.0
74-75	133.290	48.982	84.306	2.754	81.553	109.671	60.688	20.865	0.0
75-76	99.228	49.150	50.076	2.728	47.644	86.884	38.028	9.616	-0.295
76-77	115.904	48.982	66.921	2.778	64.143	99.958	50.975	13.168	0.0
77-78	127.288	48.982	78.304	2.575	77.244	101.020	53.552	23.692	-1.515
78-79	103.704	48.982	54.721	2.682	52.040	90.157	41.174	10.865	0.0
79-80	119.475	49.150	70.323	2.824	67.500	100.823	51.672	15.828	0.0
80-81	128.923	48.982	79.939	2.528	78.537	110.072	62.214	16.323	-1.125
81-82	131.176	48.982	82.192	2.797	79.396	104.527	55.544	23.852	0.0
82-83	92.566	48.982	43.583	2.276	41.623	82.710	34.044	7.580	-0.316
83-84	124.810	49.150	75.658	2.563	74.191	116.394	68.338	5.853	-1.095
AVE.	116.935	49.024	67.909	2.668	65.511	96.633	47.878	17.633	-0.270

TABLE E1-14 SUMMARY TABLE OF SURPLUS WATER FROM PHASE I AREA

(MAIN CANAL CAPACITY: 11.82 cu.m./sec)

* RESERVOIR CAPACITY 5.99 (MCM)
 * MAIN CANAL CAPACITY 11.82 (CU.M/S)

YEAR	INFLOW (MCM)	DEMAND (MCM)	BALANCE (MCM)	EVAPORAT. (MCM)	REMAIN (MCM)	INTAKE (MCM)	BAYONGAN (MCM)	SPILLAGE (MCM)	SHORTAGE (MCM)
56-57	154.863	48.982	105.879	2.812	103.068	110.421	61.438	41.630	0.0
57-58	82.539	48.982	33.556	2.639	30.918	72.798	23.816	7.102	0.0
58-59	93.277	48.982	44.294	2.719	41.576	82.680	33.698	7.878	0.0
59-60	102.310	49.150	53.158	2.707	50.452	84.295	35.144	15.308	0.0
60-61	105.817	48.982	56.834	2.732	54.102	95.052	46.070	8.033	0.0
61-62	127.738	48.982	78.755	2.791	75.964	107.499	58.516	17.448	0.0
62-63	145.489	48.982	96.505	2.675	94.839	117.959	69.985	24.854	-1.008
63-64	107.888	49.150	58.737	2.682	56.055	91.373	42.222	13.833	0.0
64-65	170.697	48.982	121.713	2.659	119.054	112.725	64.424	55.313	-0.682
65-66	96.303	48.982	47.320	2.637	44.683	87.143	38.863	6.523	-0.702
66-67	120.092	48.982	71.109	2.605	68.504	101.894	52.911	15.593	0.0
67-68	89.151	49.150	39.999	2.596	37.404	78.844	29.693	7.711	0.0
68-69	97.590	48.982	48.606	2.557	46.049	75.046	26.230	20.011	-0.165
69-70	99.041	48.982	50.058	2.793	47.265	90.839	41.952	5.288	0.0
70-71	138.153	48.982	89.170	2.806	86.364	122.274	73.291	13.073	0.0
71-72	132.374	49.150	83.222	2.634	80.588	107.825	59.323	21.915	-0.649
72-73	102.780	48.982	53.796	2.527	51.271	84.381	35.399	15.872	0.0
73-74	131.711	48.982	82.728	2.638	80.091	100.341	51.358	28.733	0.0
74-75	133.290	48.982	84.306	2.754	81.553	110.785	61.802	19.751	0.0
75-76	99.228	49.150	50.076	2.728	47.348	87.771	38.916	8.728	-0.295
76-77	115.904	48.982	66.921	2.778	64.143	101.262	52.279	11.864	0.0
77-78	127.288	48.982	78.304	2.575	75.729	102.225	54.757	22.487	-1.515
78-79	103.704	48.982	54.721	2.682	52.039	90.944	41.961	10.078	0.0
79-80	119.475	49.150	70.323	2.824	67.500	102.147	52.996	14.504	0.0
80-81	128.923	48.982	79.939	2.528	77.411	111.683	63.825	14.712	-1.125
81-82	131.176	48.982	82.192	2.797	79.395	105.642	56.660	22.737	0.0
82-83	92.566	48.982	43.583	2.276	41.307	83.490	34.824	6.800	-0.316
83-84	124.810	49.150	75.658	2.563	73.095	117.065	69.010	5.181	-1.095
AVE.	116.935	49.024	67.909	2.668	65.241	97.732	48.977	16.534	-0.270

TABLE EI-15 SUMMARY TABLE OF SURPLUS WATER FROM PHASE I AREA

(MAIN CANAL CAPACITY: 13.0 cu.m/sec)

* RESERVOIR CAPACITY 5.99 (MCM)
 * MAIN CANAL CAPACITY 13.00 (CU.M/S)

YEAR	INFLOW (MCM)	DEMAND (MCM)	BALANCE (MCM)	EVAPORAT. (MCM)	REMAIN (MCM)	INTAKE (MCM)	BAYONGAN (MCM)	SPILLAGE (MCM)	SHORTAGE (MCM)
56-57	154.863	48.982	105.879	2.812	103.068	112.939	63.956	39.112	0.0
57-58	82.539	48.982	33.556	2.639	30.918	73.287	24.306	6.612	0.0
58-59	93.277	48.982	44.294	2.719	41.576	83.747	34.765	6.811	0.0
59-60	102.310	49.150	53.158	2.707	50.452	85.484	36.334	14.118	0.0
60-61	105.817	48.982	56.834	2.732	54.102	96.241	47.258	6.844	0.0
61-62	127.738	48.982	78.755	2.791	75.964	109.399	60.416	15.548	0.0
62-63	145.489	48.982	96.505	2.675	94.839	120.254	72.280	22.559	-1.008
63-64	107.888	49.150	58.737	2.682	56.055	92.169	43.018	13.037	0.0
64-65	170.697	48.982	121.713	2.659	119.054	115.188	66.887	52.850	-0.682
65-66	96.303	48.982	47.320	2.637	44.683	87.869	39.589	5.797	-0.702
66-67	120.092	48.982	71.109	2.605	68.504	103.827	54.845	13.659	0.0
67-68	89.151	49.150	39.999	2.596	37.404	79.711	30.560	6.844	0.0
68-69	97.590	48.982	48.606	2.577	46.029	75.664	26.847	19.394	-0.165
69-70	99.041	48.982	50.058	2.793	47.265	91.806	42.823	4.417	0.0
70-71	138.153	48.982	89.170	2.806	86.364	124.730	75.747	10.617	0.0
71-72	132.374	49.150	83.222	2.634	80.588	109.558	61.056	20.182	-0.649
72-73	102.780	48.982	53.796	2.527	51.269	85.290	36.308	14.963	0.0
73-74	131.711	48.982	82.728	2.638	80.091	101.602	52.619	27.471	0.0
74-75	133.290	48.982	84.306	2.754	81.553	112.238	63.255	18.298	0.0
75-76	99.228	49.150	50.076	2.728	47.348	88.995	40.139	7.505	-0.295
76-77	115.904	48.982	66.921	2.778	64.143	102.663	53.680	10.463	0.0
77-78	127.288	48.982	78.304	2.575	75.729	103.800	56.332	20.912	-1.515
78-79	103.704	48.982	54.721	2.682	52.039	91.941	42.958	9.081	0.0
79-80	119.475	49.150	70.323	2.824	67.500	103.807	54.656	12.843	0.0
80-81	128.923	48.982	79.939	2.528	77.411	113.533	65.675	12.862	-1.125
81-82	131.176	48.982	82.192	2.797	79.395	106.995	58.012	21.384	0.0
82-83	92.566	48.982	43.583	2.276	41.307	84.255	35.589	6.035	-0.316
83-84	124.810	49.150	75.658	2.563	73.095	117.773	69.717	4.473	-1.095
AVE.	116.935	49.024	67.909	2.668	65.241	99.099	50.344	15.167	-0.270

TABLE E1-16 ESTIMATED SURPLUS WATER FROM PHASE I AREA TO PHASE II AREA

UNIT : MCM

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	TOTAL
56-57	1.322	4.022	11.193	7.983	2.070	4.172	6.080	4.218	3.913	4.255	2.071	2.298	7.843	61.438
57-58*	1.759	3.347	0.939	1.513	1.122	2.166	4.278	3.519	0.852	1.735	0.0	0.410	2.176	23.815
58-59*	0.805	2.658	0.890	2.226	0.710	3.746	3.228	3.255	0.179	5.106	4.296	3.812	2.787	33.697
59-60*	0.899	2.871	3.303	4.140	1.497	2.281	5.441	4.669	3.698	2.191	0.0	2.715	1.441	35.144
60-61	2.725	6.302	3.397	4.489	2.083	0.862	4.042	4.329	1.774	2.221	2.378	5.105	6.362	46.071
61-62	5.932	3.777	4.145	2.168	4.232	7.792	3.948	2.530	4.343	2.782	4.930	9.754	2.182	58.516
62-63	1.854	7.529	4.793	10.704	3.804	6.936	4.562	3.277	0.0	0.0	7.195	7.385	11.946	69.986
63-64	2.806	4.652	1.342	1.700	4.302	2.325	3.938	10.185	1.839	0.0	0.0	4.583	4.550	42.222
64-65	1.615	15.325	8.300	7.462	3.096	6.532	5.251	3.544	5.393	1.101	0.0	2.762	4.043	64.425
65-66	2.874	1.607	5.511	0.918	0.0	1.107	3.053	8.222	0.0	1.868	3.503	4.344	5.855	38.862
66-67	3.970	2.392	2.713	10.093	5.661	10.311	4.292	3.442	1.335	2.286	0.0	2.001	4.416	52.912
67-68*	0.640	4.405	6.119	2.229	0.0	1.452	2.814	2.289	0.264	0.362	0.0	3.209	5.909	29.693
68-69*	0.925	5.477	7.358	0.895	0.0	1.685	3.988	3.126	0.0	1.196	0.0	1.193	0.386	26.229
69-70	3.389	2.657	7.424	0.563	2.580	1.318	2.949	2.678	4.857	5.746	1.796	2.586	3.407	41.951
70-71	7.976	8.114	5.697	4.225	2.129	4.254	3.932	9.730	9.970	4.488	1.730	5.493	5.554	73.293
71-72	3.311	10.364	2.808	9.304	0.0	3.843	4.234	7.010	1.908	3.949	0.0	8.211	4.383	59.325
72-73	3.170	5.605	3.055	1.251	0.0	0.0	0.687	2.558	1.548	1.855	1.609	8.117	5.945	35.400
73-74	0.628	10.772	8.676	2.116	4.247	6.321	8.074	5.888	2.139	0.116	0.0	0.015	2.368	51.359
74-75	3.303	7.620	5.644	10.994	3.273	2.878	6.638	2.942	1.551	2.001	1.307	8.076	5.577	61.803
75-76	2.509	2.256	4.621	6.636	1.884	2.353	3.121	3.676	2.294	0.0	6.071	3.452	0.042	38.916
76-77	1.224	2.774	8.155	6.077	10.232	4.892	3.048	4.962	0.259	1.353	2.615	3.918	2.771	52.280
77-78	1.209	4.131	1.858	8.949	2.212	0.612	5.148	4.571	4.990	0.026	0.0	12.949	8.102	54.757
78-79	2.806	4.306	5.612	2.879	0.0	0.0	4.055	5.057	7.877	4.063	0.0	2.577	2.730	41.962
79-80	1.663	2.770	4.375	5.266	3.614	0.265	3.328	1.647	4.040	4.706	10.616	4.750	5.955	52.996
80-81	5.112	9.596	11.065	15.545	3.327	2.163	4.314	2.604	0.185	1.830	0.0	0.049	8.034	63.825
81-82	2.029	5.054	9.117	3.085	4.553	6.983	4.429	4.906	1.169	2.104	5.041	2.079	6.112	56.660
82-83*	1.353	2.054	1.535	0.0	0.0	0.0	0.0	0.0	0.0	4.009	9.077	9.251	7.546	34.825
83-84	3.336	4.278	11.040	5.435	7.004	7.279	5.060	4.167	1.278	0.0	3.552	9.436	7.146	69.011
AVE.	2.541	5.240	5.382	4.959	2.630	3.376	4.069	4.250	2.416	2.191	2.421	4.662	4.842	48.977
DRY- YEAR	1.064	3.469	3.357	1.834	0.555	1.888	3.291	2.810	0.832	2.433	2.229	3.432	3.374	30.567

Note: Year with an asterisk shows the year with less surplus water amount (dry year)

CHAPTER II AVAILABLE WATER FOR PHASE II AREA

Available water resources for irrigation in Phase II project area are 1) runoff discharges to be stored in the both reservoirs of Bayongan in the Bayongan river and Capayas in the Bayang river and ii) the surplus water introduced from the main canal of Phase I project.

2.1 Bayongan Reservoir

The available water for the Bayongan reservoir consists of runoff discharge from its own catchment area and surplus water from Phase I Project area which is conveyed through main canal with its maximum capacity of 11.8 cu.m/sec.

Following table indicates the summary of these water the sources estimated, and their details are shown in TABLE E2-1, TABLE E2-2 and FIGURE E2-1.

2.2 Capayas Reservoir

The available water for the Capayas reservoir consists of runoff discharge from its own catchment area only. TABLE E2-3 shows the estimated available water for the Capayas reservoir.

Surplus Water to Phase II Area

(Unit: MCM)

<u>Year</u>	<u>Inflow</u>	<u>Surplus</u>	<u>Spillage</u>
1956-57	154.863	61.438	41.630
1957-58	82.539	23.815	7.102
1958-59	93.277	33.697	7.878
1959-60	102.310	35.144	15.308
1960-61	105.817	46.071	8.033
1961-62	127.738	58.516	17.448
1962-63	145.489	69.986	24.854
1963-64	107.888	42.222	13.833
1964-65	170.697	64.425	55.313
1965-66	96.303	38.862	6.523
1966-67	120.092	52.912	15.593
1967-68	89.151	29.693	7.711
1968-69	97.590	26.229	20.011
1969-70	99.041	41.951	5.288
1970-71	138.153	73.293	13.073
1971-72	132.374	59.325	21.915
1972-73	102.780	35.400	15.872
1973-74	131.711	51.359	28.733
1974-75	133.290	61.803	19.751
1975-76	99.228	38.916	8.728
1976-77	115.904	52.280	11.864
1977-78	127.288	54.757	22.487
1978-79	103.704	41.962	10.078
1979-80	119.475	52.996	14.504
1980-81	128.923	63.825	14.712
1981-82	131.176	56.660	22.737
1982-83	92.566	34.825	6.800
1983-84	124.810	69.011	5.181
<u>Average</u>	<u>116.935</u>	<u>48.977</u>	<u>16.534</u>

TABLE E2-1 ESTIMATED RUNOFF DISCHARGE (INFLOW) FROM BAYONGAN CATCHMENT AREA

UNIT : MCM

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	TOTAL
56-57	0.083	1.031	2.366	0.956	0.952	0.490	0.740	0.210	1.598	2.103	0.859	0.668	1.619	13.675
57-58*	0.0	0.607	0.412	0.624	0.522	0.348	0.515	0.304	0.771	1.276	0.720	0.644	0.278	7.021
58-59*	0.064	0.788	0.282	1.364	0.400	1.210	0.063	0.397	0.551	2.291	1.049	0.867	0.488	9.814
59-60*	0.064	0.619	0.761	1.332	0.455	0.249	0.862	0.625	1.453	0.852	0.418	1.273	0.403	9.366
60-61	0.374	1.334	0.757	0.863	0.469	0.230	0.491	0.297	0.494	2.126	0.599	1.236	1.299	10.569
61-62	0.753	0.920	0.888	0.595	1.485	0.895	0.100	0.675	1.120	1.184	1.508	1.529	0.326	11.978
62-63	0.273	2.066	0.778	1.598	0.763	1.078	0.272	0.024	0.215	1.661	1.140	1.475	1.434	12.777
63-64	0.262	0.830	0.352	0.666	1.630	0.074	0.348	1.863	0.490	1.041	0.256	1.388	0.667	9.867
64-65	0.206	5.046	1.330	1.884	0.855	0.683	0.319	0.037	1.680	0.768	0.852	0.737	0.949	15.346
65-66	0.101	0.576	0.915	0.411	0.263	0.120	0.303	1.083	0.282	1.916	1.089	0.512	1.285	8.856
66-67	0.524	0.503	0.919	2.271	1.331	1.308	0.230	0.557	0.657	0.712	0.544	0.948	0.640	11.144
67-68*	0.081	0.911	0.979	0.560	0.230	0.373	0.017	0.012	0.735	0.582	0.540	1.086	1.233	7.339
68-69*	0.104	2.137	1.650	0.124	0.036	0.415	0.072	0.478	0.738	1.267	0.608	0.798	0.185	8.612
69-70	0.417	0.624	1.179	0.361	0.671	0.138	0.078	0.193	1.812	1.318	0.711	0.773	0.632	8.907
70-71	1.372	1.062	0.587	1.329	0.223	0.563	0.582	1.225	1.700	1.211	0.872	1.012	1.044	12.782
71-72	0.038	1.675	0.430	2.012	0.144	0.469	0.133	0.946	1.030	0.706	1.260	1.420	0.336	10.599
72-73	0.510	0.778	0.753	0.163	0.148	0.113	0.022	0.003	1.021	0.963	1.528	1.207	0.759	7.968
73-74	0.072	2.955	1.347	0.229	1.445	0.594	1.111	0.483	1.393	0.565	0.497	0.388	0.413	11.492
74-75	0.138	1.572	1.291	1.864	0.639	0.477	0.690	0.079	1.159	1.319	0.781	1.352	0.729	12.090
75-76	0.396	0.542	0.847	1.521	0.320	0.197	0.049	0.255	0.989	0.690	1.761	0.596	0.088	8.251
76-77	0.127	0.343	1.791	1.823	1.476	0.311	0.011	0.830	0.620	1.380	1.457	0.660	0.667	11.496
77-78	0.158	1.005	0.251	1.529	0.695	0.141	0.321	0.169	1.747	0.868	0.392	1.106	0.649	9.031
78-79	0.184	0.577	0.972	0.606	0.186	0.148	0.342	0.892	1.628	1.161	0.338	0.744	0.079	7.857
79-80	0.538	0.505	0.632	1.121	1.654	0.124	0.314	0.313	1.035	1.768	3.789	1.421	2.168	15.382
80-81	0.161	0.953	1.552	1.158	0.455	0.294	0.198	0.325	0.376	1.659	0.502	1.008	1.103	9.744
81-82	0.407	0.633	2.286	0.396	0.723	1.089	0.028	0.370	0.779	0.767	1.399	0.697	1.290	10.864
82-83*	0.073	0.296	0.497	0.114	0.036	0.005	0.0	0.022	0.590	1.707	0.738	1.243	0.797	6.118
83-84	0.374	0.663	1.554	0.888	1.300	0.772	0.238	0.344	0.310	0.288	0.131	1.503	0.871	9.236
AVE.	0.280	1.127	1.013	1.013	0.697	0.461	0.302	0.465	0.963	1.220	0.941	1.010	0.801	10.292
DRY- VFAR	0.064	0.893	0.763	0.686	0.280	0.433	0.255	0.306	0.806	1.329	0.679	0.985	0.564	8.045

Note: Year with an asterisk shows the year with less surplus water amount (dry year)

TABLE E2-2 ESTIMATED TOTAL AVAILABLE WATER FOR BAYONGAN RESERVOIR

UNIT : MCM

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	TOTAL
56-57	1.405	5.053	13.559	8.939	3.022	4.662	6.820	4.428	5.511	6.358	2.930	2.966	9.462	75.113
57-58*	1.759	3.954	1.351	2.137	1.644	2.514	4.793	3.823	1.623	3.011	0.720	1.054	2.454	30.836
58-59*	0.869	3.446	1.172	3.590	1.110	4.956	3.291	3.652	0.730	7.397	5.345	4.679	3.275	43.511
59-60*	0.963	3.490	4.064	5.472	1.952	2.530	6.303	5.294	5.151	3.043	0.418	3.988	1.844	44.510
60-61	3.099	7.636	4.154	5.352	2.552	1.092	4.533	4.626	2.268	4.347	2.977	6.341	7.661	56.640
61-62	6.685	4.697	5.033	2.763	5.717	8.687	4.048	3.205	5.463	3.966	6.438	11.283	2.508	70.494
62-63	2.127	9.595	5.571	12.302	4.567	8.014	4.834	3.301	0.215	1.661	8.335	8.860	13.380	82.763
63-64	3.068	5.482	1.694	2.366	5.932	2.399	4.286	12.048	2.329	1.041	0.256	5.971	5.217	52.089
64-65	1.821	20.371	9.630	9.346	3.951	7.215	5.570	3.581	7.073	1.869	0.852	3.499	4.992	79.771
65-66	2.975	2.183	6.426	1.329	0.263	1.227	3.356	9.305	0.282	3.784	4.592	4.856	7.140	47.718
66-67	4.494	2.895	3.632	12.364	6.992	11.619	4.522	3.999	1.992	2.998	0.544	2.949	5.056	64.056
67-68*	0.721	5.316	7.098	2.789	0.230	1.825	2.831	2.301	0.999	0.944	0.540	4.295	7.142	37.032
68-69*	1.029	7.614	9.008	1.019	0.036	2.100	4.060	3.604	0.738	2.463	0.608	1.991	0.571	34.841
69-70	3.806	3.281	8.603	0.924	3.251	1.456	3.027	2.871	6.669	7.064	2.507	3.359	4.039	50.858
70-71	9.348	9.176	6.284	5.554	2.352	4.817	4.514	10.955	11.670	5.699	2.602	6.505	6.598	86.075
71-72	3.349	12.039	3.238	11.316	0.144	4.312	4.367	7.956	2.938	4.655	1.260	9.631	4.719	69.924
72-73	3.680	6.383	3.808	1.414	0.148	0.113	0.709	2.561	2.569	2.818	3.137	9.324	6.704	43.368
73-74	0.700	13.727	10.023	2.345	5.692	6.915	9.185	6.371	3.532	0.681	0.497	0.403	2.781	62.851
74-75	3.441	9.192	6.935	12.858	3.912	3.355	7.328	3.021	2.710	3.320	2.088	9.428	6.306	73.893
75-76	2.905	2.798	5.468	8.157	2.204	2.550	3.170	3.931	3.283	0.690	7.832	4.048	0.130	47.167
76-77	1.351	3.117	9.946	7.900	11.708	5.203	3.059	5.792	0.879	2.733	4.072	4.578	3.438	63.776
77-78	1.367	5.136	2.109	10.478	2.907	0.753	5.469	4.740	6.737	0.894	0.392	14.055	8.751	63.788
78-79	2.990	4.883	6.584	3.485	0.186	0.148	4.397	5.949	9.505	5.224	0.338	3.321	2.809	49.819
79-80	2.201	3.275	5.007	6.387	5.268	0.389	3.642	1.960	5.075	6.474	14.405	6.171	8.123	68.378
80-81	5.273	10.549	12.617	16.703	3.782	2.457	4.512	2.929	0.561	3.489	0.502	1.057	9.137	73.569
81-82	2.436	5.687	11.403	3.481	5.276	8.072	4.457	5.276	1.948	2.871	6.440	2.776	7.402	67.524
82-83*	1.426	2.350	2.032	0.114	0.036	0.005	0.0	0.022	0.590	5.716	9.815	10.494	8.343	40.943
83-84	3.710	4.941	12.594	6.323	8.304	8.051	5.298	4.511	1.588	0.288	3.683	10.939	8.017	78.247
AVE.	2.821	6.367	6.394	5.972	3.326	3.837	4.371	4.715	3.380	3.411	3.362	5.672	5.643	59.270
DRY- YEAR	1.128	4.362	4.121	2.520	0.835	2.322	3.546	3.116	1.638	3.762	2.908	4.417	3.938	38.612

Note: Year with an asterisk shows the year with less surplus water amount (dry year)

TABLE E2-3

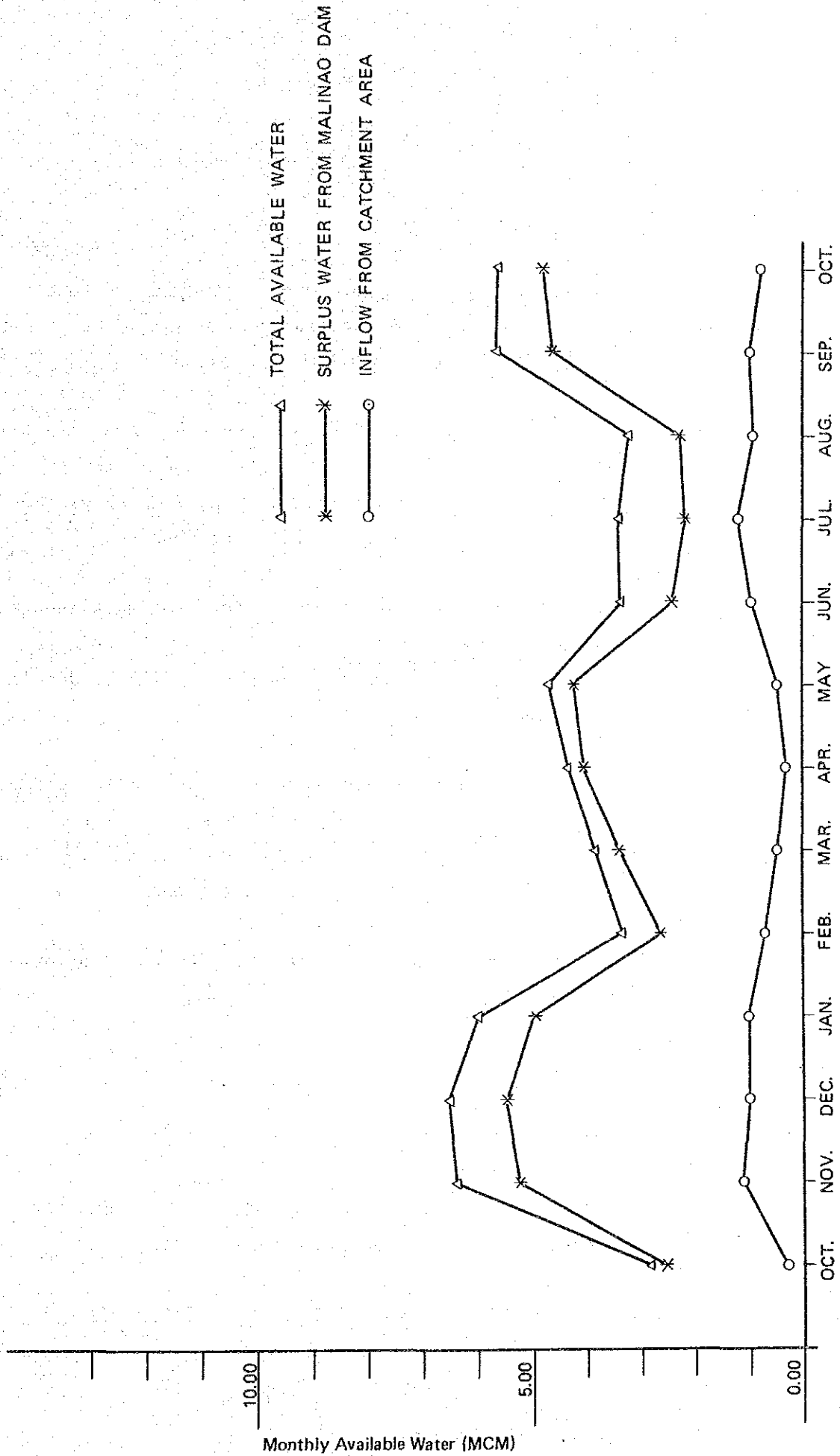
ESTIMATED AVAILABLE WATER FOR CAPAYAS RESERVOIR

UNIT : MCM

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	TOTAL
56-57	0.106	1.085	2.471	1.043	1.006	0.541	0.773	0.248	1.674	2.206	0.944	0.719	1.673	14.489
57-58*	0.0	0.660	0.478	0.698	0.576	0.397	0.556	0.352	0.846	1.354	0.806	0.697	0.316	7.736
58-59*	0.069	0.870	0.328	1.427	0.445	1.282	0.085	0.467	0.618	2.389	1.112	0.948	0.537	10.577
59-60*	0.082	0.681	0.825	1.404	0.513	0.296	0.909	0.667	1.536	0.923	0.477	1.321	0.449	10.083
60-61	0.394	1.417	0.824	0.954	0.538	0.284	0.559	0.359	0.548	2.215	0.656	1.296	1.358	11.402
61-62	0.778	0.978	0.958	0.663	1.566	0.987	0.115	0.712	1.234	1.281	1.598	1.614	0.389	12.873
62-63	0.297	2.118	0.857	1.700	0.816	1.179	0.285	0.032	0.249	1.757	1.240	1.553	1.501	13.584
63-64	0.284	0.900	0.398	0.739	1.721	0.099	0.418	1.970	0.565	1.107	0.296	1.453	0.722	10.672
64-65	0.231	5.087	1.391	1.967	0.918	0.730	0.381	0.050	1.759	0.830	0.927	0.802	0.989	16.062
65-66	0.120	0.647	1.006	0.486	0.306	0.151	0.345	1.154	0.323	2.005	1.173	0.567	1.348	9.631
66-67	0.550	0.564	0.998	2.359	1.402	1.376	0.261	0.588	0.695	0.781	0.598	1.013	0.683	11.868
67-68*	0.094	0.996	1.031	0.650	0.270	0.434	0.023	0.017	0.808	0.621	0.590	1.133	1.283	7.950
68-69*	0.128	2.171	1.724	0.168	0.048	0.439	0.095	0.510	0.805	1.337	0.673	0.875	0.208	9.181
69-70	0.448	0.700	1.232	0.413	0.753	0.174	0.105	0.223	1.887	1.411	0.754	0.823	0.686	9.609
70-71	1.409	1.124	0.660	1.428	0.261	0.623	0.620	1.328	1.819	1.287	0.958	1.085	1.099	13.701
71-72	0.051	1.775	0.487	2.097	0.175	0.516	0.171	1.014	1.110	0.732	1.364	1.524	0.363	11.379
72-73	0.539	0.857	0.792	0.180	0.181	0.144	0.031	0.004	1.116	1.038	1.625	1.304	0.774	8.585
73-74	0.081	3.050	1.414	0.278	1.503	0.658	1.230	0.573	1.446	0.614	0.559	0.452	0.469	12.327
74-75	0.159	1.643	1.362	1.954	0.681	0.509	0.781	0.097	1.228	1.362	0.824	1.418	0.791	12.809
75-76	0.419	0.612	0.919	1.605	0.350	0.223	0.066	0.302	1.060	0.768	1.825	0.632	0.100	8.881
76-77	0.149	0.381	1.852	1.880	1.586	0.354	0.015	0.907	0.672	1.465	1.528	0.709	0.692	12.190
77-78	0.164	1.077	0.267	1.579	0.722	0.155	0.357	0.206	1.803	0.928	0.448	1.175	0.714	9.595
78-79	0.202	0.615	1.035	0.678	0.220	0.173	0.381	0.938	1.696	1.229	0.377	0.794	0.100	8.438
79-80	0.574	0.544	0.703	1.215	1.686	0.154	0.378	0.345	1.150	1.829	3.875	1.468	2.213	16.134
80-81	0.181	1.038	1.623	1.213	0.506	0.319	0.219	0.348	0.413	1.741	0.531	1.041	1.144	10.317
81-82	0.447	0.681	2.326	0.445	0.786	1.147	0.038	0.412	0.822	0.815	1.461	0.746	1.358	11.484
82-83*	0.087	0.326	0.532	0.154	0.048	0.007	0.0	0.030	0.636	1.810	0.793	1.279	0.832	6.534
83-84	0.393	0.704	1.609	0.966	1.367	0.841	0.286	0.355	0.335	0.307	0.152	1.527	0.912	9.754
AVE.	0.301	1.189	1.075	1.084	0.748	0.507	0.339	0.507	1.030	1.291	1.006	1.070	0.847	10.994
DRY- YEAR	0.077	0.951	0.820	0.750	0.317	0.476	0.278	0.340	0.875	1.406	0.742	1.042	0.604	8.677

Note: Year with an asterisk shows the year with less surplus water amount (dry year)

FIGURE E2-1 MONTHLY TOTAL AVAILABLE WATER FOR BOYONGAN RESERVOIR (1956 - 1984)



CHAPTER III WATER BALANCE STUDY FOR PHASE II AREA

3.1 Water Balance Rule

Two reservoirs, Bayongan and Capayas are planned to be constructed in the Phase II project area, and should be operated systematically because of the following reasons;

- Runoff discharges from their own catchment area are not sufficient to meet the required water demand for the area of 5,300 ha, so that the limited water sources should be utilized effectively under good water management.
- Especially, the Capayas reservoir does not have enough capacity for the Capayas system of 1,160 ha, thus the shortage amount of water in this system will be supplied from the Bayongan reservoir.

Under the considerations, water balance in the Capayas system, first of all, will be made to grasp the amount of water shortages, and these shortages of the Capayas system will be counted in the required water demand for the Bayongan reservoir.

FIGURE E3-1 and FIGURE E3-2 shows the flow chart of water balance study for the phase II area.

3.2 Water Balance Study

3.2.1 Alternative Plan

Following 11 cases of alternative studies were analyzed to find the most optimum size of the Bayongan reservoir.

Alternative I	:	Reservoir capacity	:	25.0 MCM
		Cropping intensity	:	160 %
				170 %
				180 %

FIGURE E3-1 FLOW CHART OF WATER BALANCE STUDY FOR CAPAYAS RESERVOIR

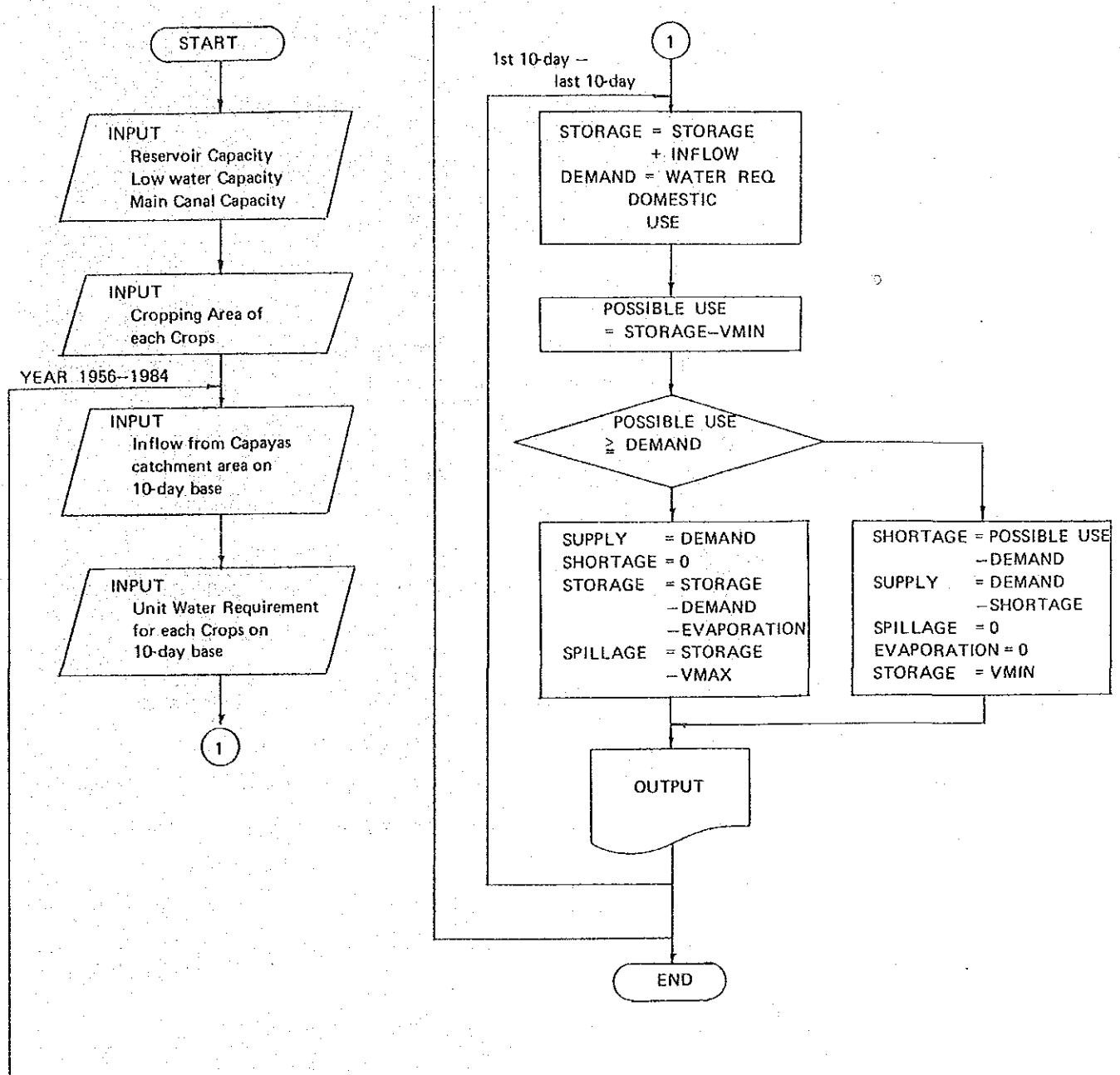
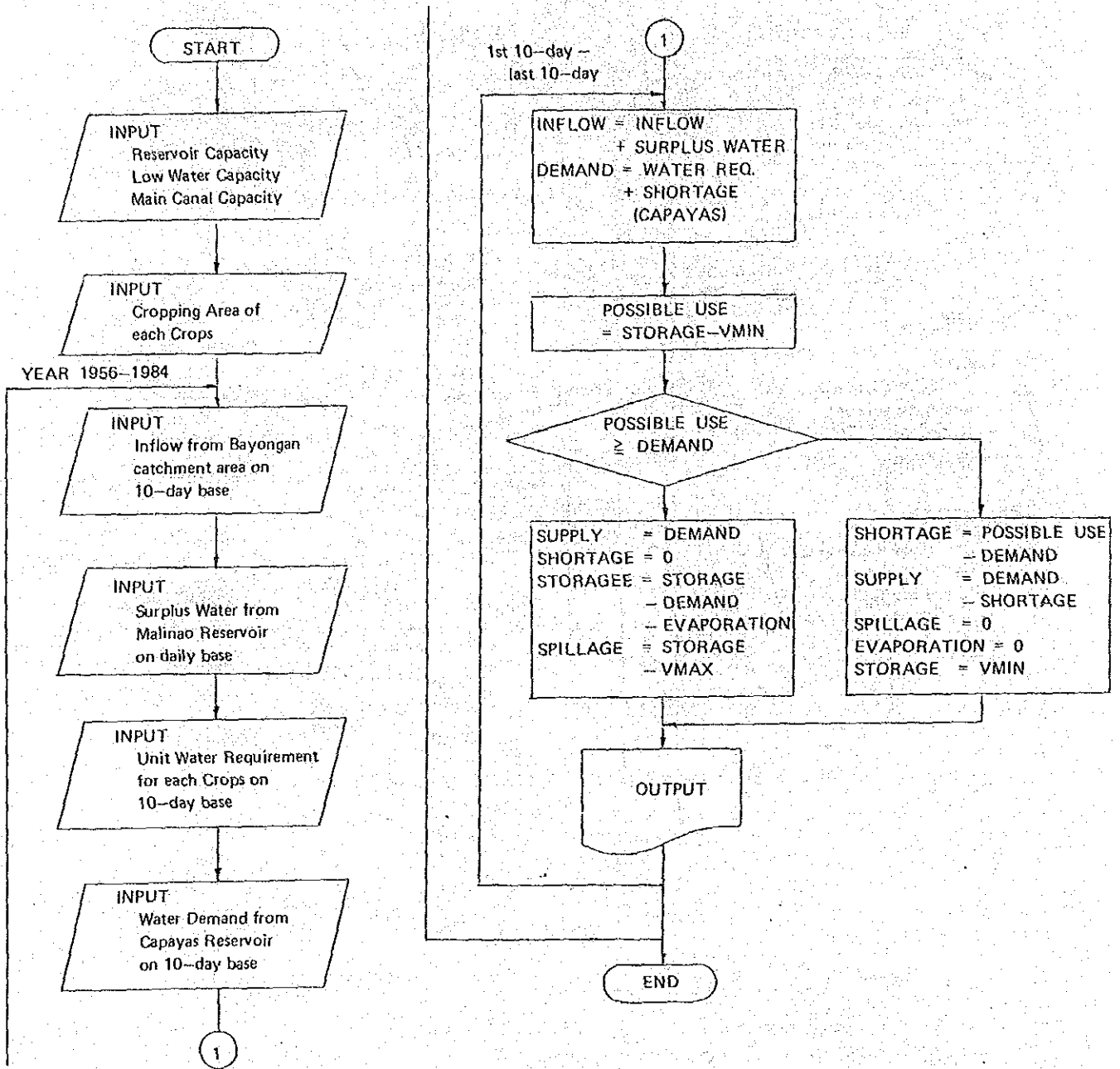


FIGURE E3-2 FLOW CHART OF WATER BALANCE STUDY FOR BAYONGAN RESERVOIR



Alternative II :	Reservoir capacity :	27.5 MCM
	Cropping intensity :	160 %
		170 %
		180 %
		190 %
		200 %
Alternative III :	Reservoir capacity :	30.0 MCM
	Cropping intensity :	170 %
		180 %
		190 %

3.2.2 Reservoir Operation

The Bayongan reservoir operation studies were made for the period of 28 years in each alternative plan, based on the inflow to the Bayongan reservoir and water demand for irrigation, and their results of study are summarized in TABLE E3-6 to TABLE E3-17. From the results of the study, annual average irrigation area for the period of 28 years was calculated with classification of two season irrigable areas, as shown in TABLE E3-18 to TABLE E3-20.

In the above calculation of annual average irrigation area, the period having the water shortage days more than continuous ten days was regarded as drought period with crop damage under the rainfed conditions.

3.2.3 Optimum Size of Bayongan Reservoir

In addition to the water balance study, optimum size of the Bayongan reservoir was analyzed by using the benefit-cost ratio (B/C) in each alternative plan.

Incremental Benefits

The incremental benefits after the implementation of the project were estimated on preliminary level in each case and the estimated benefits were discounted to the present values as shown in TABLE E3-21.

Construction Cost

Construction costs consist of dams, canals and on-farm development costs. Out of these costs, construction costs of the Bayongan dam are estimated in the items of embankment cost, spillway cost, intake facilities cost for each alternative plan by using the storage and construction cost curve shown in FIGURE E3-3. And, these costs are discounted to the present worth values as shown TABLE E3-26.

Based on the obtained annual benefits and costs, benefit and cost ratio (B/C) was analyzed as the index of project evaluation. The results of analysis are indicated in TABLE E3-27.

TABLE E3-1 SUMMARY TABLE OF RESERVOIR OPERATION FOR CAPAYAS DAM

YEAR	INFLOW (MCM)	DEMAND (MCM)	INTAKE (MCM)	DEM TO BAY (MCM)	FR BAY (MCM)	EVAPO (MCM)	SPILLAGE (MCM)	SHORTAGE (MCM)
56-57	14.489	8.838	7.787	-1.051	0.0	0.771	6.121	-1.051
57-58	7.736	9.880	7.700	-2.180	0.0	0.672	0.284	-2.180
58-59	10.577	8.375	8.355	-0.020	0.0	0.764	1.135	-0.020
59-60	10.083	8.448	7.316	-1.133	0.0	0.755	2.314	-1.133
60-61	11.402	8.109	7.005	-1.104	0.0	0.767	3.493	-1.104
61-62	12.873	5.033	5.033	0.0	0.0	0.859	7.172	0.0
62-63	13.584	7.213	6.300	-0.913	0.0	0.771	6.703	-0.913
63-64	10.672	8.914	7.371	-1.543	0.0	0.701	2.791	-1.543
64-65	16.062	8.275	6.050	-2.225	0.0	0.739	9.466	-2.225
65-66	9.631	10.141	8.423	-1.718	0.0	0.598	0.797	-1.718
66-67	11.868	8.671	5.950	-2.721	0.0	0.706	5.490	-2.721
67-68	7.950	11.989	6.475	-5.515	0.0	0.556	1.022	-5.515
68-69	9.181	9.914	7.283	-2.631	0.0	0.485	2.802	-2.631
69-70	9.609	8.169	6.658	-1.511	0.0	0.669	1.834	-1.511
70-71	13.701	7.437	7.437	0.0	0.0	0.804	5.092	0.0
71-72	11.379	8.222	6.817	-1.405	0.0	0.719	4.151	-1.405
72-73	8.585	9.456	5.811	-3.645	0.0	0.507	2.444	-3.645
73-74	12.327	8.783	7.008	-1.775	0.0	0.717	5.824	-1.775
74-75	12.809	7.302	5.311	-1.991	0.0	0.794	5.760	-1.991
75-76	8.881	9.930	8.244	-1.686	0.0	0.640	1.743	-1.686
76-77	12.190	6.318	6.318	0.0	0.0	0.776	3.786	0.0
77-78	9.595	7.558	6.450	-1.108	0.0	0.749	2.594	-1.108
78-79	8.438	9.728	7.611	-2.117	0.0	0.635	1.268	-2.117
79-80	16.134	6.765	6.440	-0.325	0.0	0.720	8.216	-0.325
80-81	10.317	10.318	6.567	-3.751	0.0	0.652	3.289	-3.751
81-82	11.484	8.582	8.068	-0.514	0.0	0.712	2.895	-0.514
82-83	6.534	10.041	5.061	-4.980	0.0	0.466	1.197	-4.980
83-84	9.754	8.907	4.900	-4.007	0.0	0.677	4.631	-4.007
AVE.	10.994	8.618	6.777	-1.842	0.0	0.692	3.726	-1.842

* RESERVOIR CAPACITY 2.34 (MCM)
 * MAIN CANAL CAPACITY 2.13 (CU.M/S)

TABLE E3-2

SUMMARY TABLE OF RESERVOIR OPERATION FOR CAPAYAS DAM

CASE II-2 (CROPPING INTENSITY 170%)

* RESERVOIR CAPACITY 2.34 (MCM)
 * MAIN CANAL CAPACITY 2.13 (CU.M/S)

YEAR	INFLOW (MCM)	DEMAND (MCM)	INTAKE (MCM)	DEM. TO BAY (MCM)	FR BAY (MCM)	EVAPO (MCM)	SPILLAGE (MCM)	SHORTAGE (MCM)
56-57	14.489	9.185	8.134	-1.051	0.0	0.766	5.779	-1.051
57-58	7.736	10.375	8.005	-2.370	0.0	0.611	0.040	-2.370
58-59	10.577	8.782	8.762	-0.020	0.0	0.757	0.735	-0.020
59-60	10.083	8.938	7.805	-1.133	0.0	0.739	1.840	-1.133
60-61	11.402	8.447	7.169	-1.279	0.0	0.748	3.349	-1.279
61-62	12.873	5.346	5.346	0.0	0.0	0.854	6.864	0.0
62-63	13.584	7.550	6.632	-0.918	0.0	0.769	6.374	-0.918
63-64	10.672	9.424	7.723	-1.700	0.0	0.665	2.475	-1.700
64-65	16.062	8.549	6.323	-2.225	0.0	0.735	9.198	-2.225
65-66	9.631	10.675	8.590	-2.085	0.0	0.555	0.674	-2.085
66-67	11.868	8.984	6.264	-2.721	0.0	0.700	5.182	-2.721
67-68	7.950	12.490	6.648	-5.842	0.0	0.519	0.886	-5.842
68-69	9.181	10.496	7.447	-3.049	0.0	0.480	2.643	-3.049
69-70	9.609	8.583	7.072	-1.511	0.0	0.631	1.457	-1.511
70-71	13.701	7.823	7.823	0.0	0.0	0.794	4.716	0.0
71-72	11.379	8.613	7.208	-1.405	0.0	0.691	3.788	-1.405
72-73	8.585	10.052	5.867	-4.185	0.0	0.503	2.392	-4.185
73-74	12.327	9.180	7.405	-1.775	0.0	0.713	5.431	-1.775
74-75	12.809	7.565	5.574	-1.991	0.0	0.791	5.500	-1.991
75-76	8.881	10.370	8.515	-1.855	0.0	0.605	1.507	-1.855
76-77	12.190	6.609	6.561	-0.048	0.0	0.760	3.558	-0.048
77-78	9.595	7.969	6.861	-1.108	0.0	0.738	2.195	-1.108
78-79	8.438	10.267	7.827	-2.440	0.0	0.588	1.098	-2.440
79-80	16.134	7.192	6.682	-0.510	0.0	0.684	8.011	-0.510
80-81	10.317	10.625	6.737	-3.888	0.0	0.625	3.146	-3.888
81-82	11.484	9.046	8.362	-0.683	0.0	0.667	2.645	-0.683
82-83	6.534	10.779	5.082	-5.697	0.0	0.445	1.197	-5.697
83-84	9.754	9.112	5.105	-4.007	0.0	0.675	4.429	-4.007
AVE.	10.994	9.037	7.055	-1.982	0.0	0.672	3.468	-1.982

TABLE E3-3

SUMMARY TABLE OF RESERVOIR OPERATION FOR CAPAYAS DAM

(CASE II-3 (CROPPING INTENSITY 180%))

* RESERVOIR CAPACITY 2.34 (MCM)
 * MAIN CANAL CAPACITY 2.13 (CU.M/S)

YEAR	INFLOW (MCM)	DEMAND (MCM)	INTAKE (MCM)	DEM TO BAY (MCM)	FR BAY (MCM)	EVAPD (MCM)	SPILLAGE (MCM)	SHORTAGE (MCM)
56-57	14.489	9.570	8.519	-1.051	0.0	0.760	5.401	-1.051
57-58	7.736	10.925	8.137	-2.788	0.0	0.519	0.0	-2.788
58-59	10.577	9.234	9.214	-0.020	0.0	0.740	0.300	-0.020
59-60	10.083	9.481	8.348	-1.133	0.0	0.717	1.319	-1.133
60-61	11.402	8.819	7.355	-1.464	0.0	0.727	3.183	-1.464
61-62	12.873	5.687	5.687	0.0	0.0	0.848	6.529	0.0
62-63	13.584	7.923	7.000	-0.923	0.0	0.764	6.011	-0.923
63-64	10.672	9.990	7.858	-2.132	0.0	0.629	2.376	-2.132
64-65	16.062	8.853	6.627	-2.225	0.0	0.729	8.900	-2.225
65-66	9.631	11.266	8.750	-2.516	0.0	0.536	0.533	-2.516
66-67	11.868	9.329	6.608	-2.721	0.0	0.694	4.844	-2.721
67-68	7.950	13.045	6.895	-6.150	0.0	0.427	0.731	-6.150
68-69	9.181	11.136	7.635	-3.502	0.0	0.474	2.461	-3.502
69-70	9.609	9.043	7.460	-1.583	0.0	0.570	1.130	-1.583
70-71	13.701	8.249	8.249	0.0	0.0	0.776	4.307	0.0
71-72	11.379	9.045	7.622	-1.423	0.0	0.645	3.419	-1.423
72-73	8.585	10.710	5.931	-4.779	0.0	0.499	2.332	-4.779
73-74	12.327	9.622	7.847	-1.775	0.0	0.702	5.000	-1.775
74-75	12.809	7.852	5.861	-1.991	0.0	0.787	5.217	-1.991
75-76	8.881	10.855	8.819	-2.036	0.0	0.569	1.239	-2.036
76-77	12.190	6.928	6.790	-0.138	0.0	0.755	3.335	-0.138
77-78	9.595	8.422	7.314	-1.108	0.0	0.724	1.756	-1.108
78-79	8.438	10.862	7.952	-2.910	0.0	0.566	0.995	-2.910
79-80	16.134	7.658	6.955	-0.703	0.0	0.645	7.777	-0.703
80-81	10.317	10.960	6.916	-4.045	0.0	0.610	2.982	-4.045
81-82	11.484	9.567	8.511	-1.056	0.0	0.615	2.548	-1.056
82-83	6.534	11.591	5.091	-6.499	0.0	0.436	1.197	-6.499
83-84	9.754	9.337	5.331	-4.007	0.0	0.672	4.207	-4.007
AVE.	10.994	9.499	7.331	-2.167	0.0	0.648	3.215	-2.167

TABLE E3-4

SUMMARY TABLE OF RESERVOIR OPERATION FOR CAPAYAS DAM

(CASE II-4 (CROPPING INTENSITY 190%))

* RESERVOIR CAPACITY 2.34 (MCM)
 * MAIN CANAL CAPACITY 2.13 (CU.M/S)

YEAR	INFLOW (MCM)	DEMAND (MCM)	INTAKE (MCM)	DEM TO BAY (MCM)	FR BAY (MCM)	EVAPO (MCM)	SPILLAGE (MCM)	SHORTAGE (MCM)
56-57	14.489	9.917	8.866	-1.051	0.0	0.747	5.067	-1.051
57-58	7.736	11.419	8.192	-3.228	0.0	0.464	0.0	-3.228
58-59	10.577	9.641	9.434	-0.207	0.0	0.708	0.112	-0.207
59-60	10.083	9.970	8.838	-1.133	0.0	0.680	0.867	-1.133
60-61	11.402	9.157	7.470	-1.687	0.0	0.686	3.109	-1.687
61-62	12.873	5.999	5.999	0.0	0.0	0.842	6.222	0.0
62-63	13.584	8.260	7.315	-0.945	0.0	0.759	5.701	-0.945
63-64	10.672	10.499	7.966	-2.533	0.0	0.619	2.278	-2.533
64-65	16.062	9.126	6.901	-2.225	0.0	0.723	8.632	-2.225
65-66	9.631	11.799	8.889	-2.910	0.0	0.519	0.410	-2.910
66-67	11.868	9.642	6.921	-2.721	0.0	0.686	4.538	-2.721
67-68	7.950	13.546	7.039	-6.507	0.0	0.420	0.595	-6.507
68-69	9.181	11.719	7.799	-3.920	0.0	0.469	2.302	-3.920
69-70	9.609	9.458	7.599	-1.858	0.0	0.516	1.045	-1.858
70-71	13.701	8.636	8.636	0.0	0.0	0.758	3.939	0.0
71-72	11.379	9.436	7.756	-1.680	0.0	0.637	3.294	-1.680
72-73	8.585	11.305	5.998	-5.307	0.0	0.484	2.280	-5.307
73-74	12.327	10.019	8.209	-1.811	0.0	0.679	4.661	-1.811
74-75	12.809	8.115	6.124	-1.991	0.0	0.781	4.959	-1.991
75-76	8.881	11.295	9.075	-2.220	0.0	0.549	1.003	-2.220
76-77	12.190	7.219	7.002	-0.217	0.0	0.750	3.127	-0.217
77-78	9.595	8.832	7.724	-1.108	0.0	0.709	1.360	-1.108
78-79	8.438	11.401	8.004	-3.398	0.0	0.543	0.967	-3.398
79-80	16.134	8.085	7.181	-0.903	0.0	0.623	7.572	-0.903
80-81	10.317	11.267	7.074	-4.193	0.0	0.595	2.839	-4.193
81-82	11.484	10.031	8.616	-1.415	0.0	0.595	2.464	-1.415
82-83	6.534	12.329	5.109	-7.219	0.0	0.418	1.197	-7.219
83-84	9.754	9.542	5.536	-4.007	0.0	0.669	4.005	-4.007
AVE.	10.994	9.917	7.545	-2.371	0.0	0.630	3.019	-2.371

TABLE E3-5

SUMMARY TABLE OF RESERVOIR OPERATION FOR CAPAYAS DAM

C CASE II-5 (CROPPING INTENSITY 200%)

* RESERVOIR CAPACITY 2.34 (MCM)
 * MAIN CANAL CAPACITY 2.13 (CU.M/S)

YEAR	INFLOW (MCM)	DEMAND (MCM)	INTAKE (MCM)	DEM TO BAY (MCM)	FR BAY (MCM)	EVAPO (MCM)	SPILLAGE (MCM)	SHORTAGE (MCM)
56-57	14.489	10.301	9.250	-1.051	0.0	0.721	4.708	-1.051
57-58	7.736	11.969	8.218	-3.752	0.0	0.438	0.0	-3.752
58-59	10.577	10.093	9.476	-0.617	0.0	0.666	0.112	-0.617
59-60	10.083	10.513	9.184	-1.330	0.0	0.607	0.594	-1.330
60-61	11.402	9.529	7.580	-1.949	0.0	0.646	3.040	-1.949
61-62	12.873	6.341	6.341	0.0	0.0	0.836	5.887	0.0
62-63	13.584	8.632	7.581	-1.051	0.0	0.745	5.449	-1.051
63-64	10.672	11.065	8.085	-2.980	0.0	0.598	2.180	-2.980
64-65	16.062	9.430	7.204	-2.225	0.0	0.717	8.334	-2.225
65-66	9.631	12.390	9.037	-3.354	0.0	0.513	0.269	-3.354
66-67	11.868	9.987	7.263	-2.723	0.0	0.678	4.204	-2.723
67-68	7.950	14.102	7.203	-6.898	0.0	0.411	0.439	-6.898
68-69	9.181	12.359	8.021	-4.338	0.0	0.428	2.120	-4.338
69-70	9.609	9.918	7.692	-2.226	0.0	0.481	0.987	-2.226
70-71	13.701	9.062	9.062	0.0	0.0	0.736	3.534	0.0
71-72	11.379	9.868	7.908	-1.960	0.0	0.628	3.151	-1.960
72-73	8.585	11.963	6.060	-5.903	0.0	0.482	2.220	-5.903
73-74	12.327	10.461	8.417	-2.044	0.0	0.674	4.458	-2.044
74-75	12.809	8.402	6.411	-1.991	0.0	0.773	4.680	-1.991
75-76	8.881	11.780	9.393	-2.387	0.0	0.499	0.735	-2.387
76-77	12.190	7.538	7.231	-0.308	0.0	0.736	2.913	-0.308
77-78	9.595	9.286	8.074	-1.211	0.0	0.653	1.066	-1.211
78-79	8.438	11.996	8.048	-3.949	0.0	0.531	0.935	-3.949
79-80	16.134	8.551	7.424	-1.127	0.0	0.614	7.338	-1.127
80-81	10.317	11.602	7.254	-4.348	0.0	0.577	2.676	-4.348
81-82	11.484	10.552	8.729	-1.823	0.0	0.579	2.367	-1.823
82-83	6.534	13.141	5.117	-8.024	0.0	0.410	1.197	-8.024
83-84	9.754	9.768	5.761	-4.007	0.0	0.665	3.783	-4.007
AVE.	10.994	10.379	7.751	-2.628	0.0	0.609	2.835	-2.628

TABLE E3-6 SUMMARY OF BAYONGAN RESERVOIR OPERATION STUDY FOR ALTERNATIVE PLANS

Item	Alternative - I			Alternative - II			Alternative - III				
	Case I-1	Case I-2	Case I-3	Case II-1	Case II-2	Case II-3	Case II-4	Case II-5	Case III-1	Case III-2	Case III-3
1. Cropping Intensity (%)											
Dry Season (Oct. - Mar.)	60	70	80	60	70	80	90	100	70	80	90
Wet Season (May - Oct.)	100	100	100	100	100	100	100	100	100	100	100
Total	160	170	180	160	170	180	190	200	170	180	190
1. Cropping Area (ha)											
Dry Season	3,190	3,710	4,240	3,190	3,710	4,240	4,770	5,300	3,710	4,240	4,770
Wet Season	5,300	5,300	5,300	5,300	5,300	5,300	5,300	5,300	5,300	5,300	5,300
Total	8,490	9,010	9,540	8,490	9,010	9,540	10,100	10,600	9,010	9,540	10,100
3. Dam and Reservoir											
Total Storage Capacity (MCM)	25.0	25.0	25.0	27.5	27.5	27.5	27.5	27.5	30.0	30.0	30.0
Dam Height (m)	30.0	30.0	30.0	50.0	51.0	51.0	51.0	51.0	32.0	32.0	32.0
4. Water Demand (MCM)											
Demand in Average Year	38.2	40.1	42.2	38.2	40.1	42.2	44.4	46.3	40.1	42.2	44.3
Demand in Shortage Year	44.4-48.1	49.1-55.9	52.6-58.5	42.1-53.6	44.9-56.0	47.8-58.5	43.3-61.1	56.2-63.4	44.9-56.0	47.8-58.5	43.3-61.1
5. Water Shortage											
Number of Shortage Year	4 (8) ^{1/}	4 (8)	5 (10)	4 (4)	4 (5)	5 (5)	6 (8)	6 (8)	4 (5)	5 (5)	5 (6)
Shortage Amount/Year	1.2-16.1	1.4-18.0	1.3-20.9	3.4-14.6	5.5-16.6	3.0-18.7	1.7-21.5	2.9-23.4	3.5-14.5	3.0-16.7	4.6-18.9
Note:											
	Storage Capacity (MCM)	F.W.L. (m)	Dam Top Elevation (m)	Dam Height (m)							
Alternative - I	25.0	49.0	52.0	30.0							
Alternative - II	27.5	50.0	53.0	31.0							
Alternative - III	30.0	51.0	54.0	32.0							

1/: Figures with a parenthesis show the calculated total number of shortage years out of 28 years and figures without parenthesis show the year having the continuous water shortage days more than ten days, which is considered to be the maximum day for paddy to bring the drought damage due to no available water supply.

Detail calculations are shown in Annex E. TABLE E3-7 to TABLE E3-17

TABLE E3-7 SUMMARY TABLE OF RESERVOIR OPERATION FOR BAYONGAN DAM

(CASE I-1 (CROPPING INTENSITY 160%))

* RESERVOIR CAPACITY 25.00 (MCM)
* MAIN CANAL CAPACITY 2.13 (CU.M/S)

UNIT=(MCM)

YEAR	C.AREA	I N F L O W	TOTAL	IRRIGAT.	D E M A N D	TOTAL	INTAKE	EVAP0	LOSS	SHORT	SPILL
56-57	13.675	61.438	75.113	30.547	1.051	31.598	31.598	4.575	0.0	0.0	39.917
57-58	7.021	23.815	30.836	34.325	2.180	36.505	35.294	4.289	0.0	-1.211	6.504
58-59	9.814	33.697	43.511	28.950	0.020	28.970	28.970	4.919	0.0	0.0	0.0
59-60	9.366	35.144	44.510	29.197	1.133	30.330	30.330	4.664	0.0	0.0	12.891
60-61	10.569	46.071	56.639	27.919	1.104	29.023	29.023	4.619	0.0	0.0	13.014
61-62	11.978	58.516	70.494	16.897	0.0	16.897	16.897	4.409	0.0	0.0	49.188
62-63	12.777	69.986	82.763	24.724	0.913	25.637	25.637	4.536	0.0	0.0	52.589
63-64	9.867	42.222	52.089	30.885	1.543	32.428	32.428	4.387	0.0	0.0	22.615
64-65	15.346	64.425	79.771	28.527	2.225	30.752	29.488	4.278	0.0	-1.264	50.199
65-66	8.856	38.862	47.718	35.239	1.718	36.957	36.957	5.124	0.0	0.0	0.0
66-67	11.144	52.912	64.056	29.902	2.722	32.624	32.022	3.948	0.0	-0.602	34.707
67-68	7.339	29.693	37.032	41.840	5.515	47.355	31.166	4.031	0.0	-16.188	0.0
68-69	8.612	26.229	34.841	34.379	2.631	37.010	36.925	4.181	0.0	-0.085	2.231
69-70	8.907	41.951	50.858	28.192	1.511	29.702	29.702	5.008	0.0	0.0	3.952
70-71	12.782	73.293	86.075	25.548	0.0	25.548	25.548	4.426	0.0	0.0	49.112
71-72	10.599	59.324	69.923	28.362	1.405	29.767	29.767	4.625	0.0	0.0	37.159
72-73	7.968	35.400	43.368	32.797	3.646	36.443	30.878	3.800	0.0	-5.565	9.992
73-74	11.492	51.358	62.850	30.381	1.775	32.156	32.156	4.198	0.0	0.0	39.988
74-75	12.090	61.803	73.893	24.987	1.992	26.979	26.979	4.571	0.0	0.0	26.591
75-76	8.251	38.916	47.167	34.439	1.687	36.126	36.126	4.400	0.0	0.0	17.413
76-77	11.496	52.280	63.776	21.494	0.0	21.494	21.494	4.653	0.0	0.0	27.017
77-78	9.031	54.757	63.788	25.974	1.108	27.082	27.082	4.397	0.0	0.0	31.475
78-79	7.857	41.962	49.819	33.747	2.118	35.865	35.865	4.474	0.0	0.0	21.627
79-80	15.382	52.996	68.378	23.093	0.325	23.418	23.418	4.490	0.0	0.0	28.323
80-81	9.744	63.825	73.569	35.790	3.751	39.541	30.566	3.967	0.0	-8.975	49.050
81-82	10.864	56.660	67.524	29.761	0.514	30.275	30.275	4.432	0.0	0.0	22.802
82-83	6.118	34.825	40.943	34.848	4.980	39.828	29.040	3.511	0.0	-10.788	8.391
83-84	9.236	69.011	78.247	30.744	4.007	34.751	32.708	4.172	0.0	-2.042	45.906
AVE.	10.292	48.977	59.270	29.767	1.842	31.609	29.941	4.396	0.0	-1.669	25.095

TABLE E3-8 SUMMARY TABLE OF RESERVOIR OPERATION FOR BAYONGAN DAM

(CASE I-2 (CROPPING INTENSITY 170%))

* RESERVOIR CAPACITY 25.00 (MCM)
 * MAIN CANAL CAPACITY 2.13 (CU.M/S)

UNIT=(MCM)

YEAR	<--- I N F L O W --->	<--- I R R I G A T . --->	<--- D E M A N D --->	TOTAL	INTAKE	EVAP0	LOSS	SHORT	SPILL	
56-57	13.675	61.438	75.113	31.820	1.051	32.871	4.597	0.0	0.0	38.622
57-58	7.021	23.815	30.836	36.133	2.370	38.503	4.305	0.0	-1.390	4.669
58-59	9.814	33.697	43.511	30.432	0.020	30.452	4.803	0.0	0.0	0.0
59-60	9.366	35.144	44.510	30.990	1.133	32.123	4.672	0.0	0.0	9.725
60-61	10.569	46.071	56.639	29.163	1.279	30.442	4.561	0.0	0.0	11.653
61-62	11.978	58.516	70.494	18.055	0.0	18.055	4.450	0.0	0.0	47.988
62-63	12.777	69.986	82.763	25.965	0.918	26.883	4.532	0.0	0.0	51.348
63-64	9.867	42.222	52.089	32.746	1.700	34.446	4.381	0.0	0.0	20.604
64-65	15.346	64.425	79.771	29.529	2.225	31.754	4.274	0.0	-1.264	49.200
65-66	8.856	38.862	47.718	37.195	2.085	39.280	4.784	0.0	0.0	0.0
66-67	11.144	52.912	64.056	31.060	2.722	33.782	3.971	0.0	-0.602	31.542
67-68	7.339	29.693	37.032	43.673	5.843	49.516	3.644	0.0	-17.962	0.0
68-69	8.612	26.229	34.841	36.526	3.050	39.576	3.782	0.0	-1.693	1.672
69-70	8.907	41.951	50.858	29.707	1.511	31.218	5.056	0.0	0.0	2.389
70-71	12.782	73.293	86.075	26.964	0.0	26.964	4.414	0.0	0.0	47.707
71-72	10.599	59.324	69.923	29.794	1.405	31.199	4.606	0.0	0.0	35.746
72-73	7.968	35.400	43.368	34.982	4.185	39.167	3.297	0.0	-7.599	9.805
73-74	11.492	51.358	62.850	31.835	1.775	33.609	4.184	0.0	0.0	38.549
74-75	12.090	61.803	73.893	25.964	1.992	27.956	4.562	0.0	0.0	25.622
75-76	8.251	38.916	47.167	36.058	1.856	37.914	4.495	0.0	0.0	15.806
76-77	11.496	52.280	63.776	22.571	0.048	22.619	4.609	0.0	0.0	25.660
77-78	9.031	54.757	63.788	27.483	1.108	28.591	4.383	0.0	0.0	29.980
78-79	7.857	41.962	49.819	35.726	2.441	38.167	4.360	0.0	0.0	19.439
79-80	15.382	52.996	68.378	24.670	0.511	25.181	4.469	0.0	0.0	26.580
80-81	9.744	63.825	73.569	36.918	3.887	40.805	3.946	0.0	-9.102	47.934
81-82	10.864	56.660	67.524	31.442	0.683	32.125	4.404	0.0	0.0	20.980
82-83	6.118	34.825	40.943	37.568	5.697	43.265	3.077	0.0	-13.573	8.173
83-84	9.236	69.011	78.247	31.500	4.007	35.507	4.172	0.0	-2.042	45.151
AVE.	10.292	48.977	59.270	31.302	1.982	33.285	4.314	0.0	-1.972	23.805

TABLE E3-9

SUMMARY TABLE OF RESERVOIR OPERATION FOR BAYONGAN DAM

CASE I-3 (CROPPING INTENSITY 180%)

* RESERVOIR CAPACITY 25.00 (MCM)

* MAIN CANAL CAPACITY 2.13 (CU.M/S)

UNIT=(MCM)

YEAR	<--- I N F L O W --->	<--- D E M A N D --->	IRRIGAT.	CAPAYAS	TOTAL	INTAKE	EVAP0	LOSS	SHORT	SPILL
56-57	13.675	61.438	33.171	1.051	34.222	34.222	4.588	0.0	0.0	37.281
57-58	7.021	23.815	38.075	2.788	40.863	39.223	4.224	0.0	-1.640	2.640
58-59	9.814	33.697	32.039	0.020	32.059	31.922	4.316	0.0	-0.138	0.0
59-60	9.366	35.144	32.902	1.133	34.035	34.035	4.480	0.0	0.0	7.022
60-61	10.569	46.071	30.467	1.464	31.931	31.931	4.657	0.0	0.0	10.144
61-62	11.978	58.516	19.238	0.0	19.238	19.238	4.447	0.0	0.0	46.732
62-63	12.777	69.986	27.265	0.923	28.188	28.188	4.564	0.0	0.0	50.010
63-64	9.867	42.222	34.744	2.132	36.876	36.876	4.389	0.0	0.0	18.164
64-65	15.346	64.425	30.593	2.225	32.818	31.554	4.269	0.0	-1.264	48.142
65-66	8.856	38.862	39.273	2.516	41.789	41.789	4.212	0.0	0.0	0.0
66-67	11.144	52.912	32.257	2.722	34.979	34.377	3.979	0.0	-0.602	28.400
67-68	7.339	29.693	45.627	6.152	51.779	30.842	4.356	0.0	-20.938	0.0
68-69	8.612	26.229	38.761	3.502	42.263	38.251	4.095	0.0	-4.012	0.992
69-70	8.907	41.951	31.331	1.583	32.914	32.914	5.156	0.0	0.0	0.593
70-71	12.782	73.293	28.466	0.0	28.466	28.466	4.461	0.0	0.0	46.158
71-72	10.599	59.324	31.318	1.423	32.741	32.741	4.617	0.0	0.0	34.208
72-73	7.968	35.400	37.297	4.779	42.076	32.068	3.014	0.0	-10.008	9.573
73-74	11.492	51.358	33.388	1.775	35.163	35.163	4.163	0.0	0.0	37.016
74-75	12.090	61.803	26.956	1.992	28.948	28.948	4.554	0.0	0.0	24.638
75-76	8.251	38.916	37.758	2.037	39.795	39.795	4.671	0.0	0.0	14.125
76-77	11.496	52.280	23.682	0.138	23.820	23.820	4.587	0.0	0.0	24.106
77-78	9.031	54.757	29.070	1.108	30.178	30.178	4.406	0.0	0.0	28.369
78-79	7.857	41.962	37.815	2.912	40.727	40.727	4.588	0.0	0.0	16.651
79-80	15.382	52.996	26.292	0.703	26.995	26.995	4.805	0.0	0.0	24.430
80-81	9.744	63.825	38.096	4.045	42.141	32.893	3.966	0.0	-9.248	46.724
81-82	10.864	56.660	33.305	1.056	34.361	34.361	4.411	0.0	0.0	18.738
82-83	6.118	34.825	40.405	6.500	46.905	30.299	2.772	0.0	-16.655	7.920
83-84	9.236	69.011	32.288	4.007	36.295	34.253	4.171	0.0	-2.042	44.363
AVE.	10.292	48.977	32.924	2.167	35.092	32.717	4.319	0.0	-2.377	22.398

TABLE E3-10

SUMMARY TABLE OF RESERVOIR OPERATION FOR BAYONGAN DAM

(CASE III-1 (CROPPING INTENSITY 160%))

* RESERVOIR CAPACITY 27.54 (MCM)

* MAIN CANAL CAPACITY 2.13 (CU.M/S)

UNIT=(MCM)

YEAR	<--- I N F L O W --->	<--- D E M A N D --->	IRRIGAT.	CAPAYAS	TOTAL	INTAKE	EVAPO	LOSS	SHORT	SPILL
56-57	13.675	61.438	75.113	30.547	1.051	31.598	4.350	0.0	0.0	39.881
57-58	7.021	23.815	30.836	34.325	2.180	36.505	4.177	0.0	0.0	6.864
58-59	9.814	33.697	43.511	28.950	0.020	28.970	5.068	0.0	0.0	0.0
59-60	9.366	35.144	44.510	29.197	1.133	30.330	4.509	0.0	0.0	11.454
60-61	10.569	46.071	56.639	27.919	1.104	29.023	4.353	0.0	0.0	13.523
61-62	11.978	58.516	70.494	16.897	0.0	16.897	4.452	0.0	0.0	49.145
62-63	12.777	69.986	82.763	24.724	0.913	25.637	4.427	0.0	0.0	52.699
63-64	9.867	42.222	52.089	30.885	1.543	32.428	4.607	0.0	0.0	22.605
64-65	15.346	64.425	79.771	28.527	2.225	30.752	4.569	0.0	0.0	49.923
65-66	8.856	38.862	47.718	35.239	1.718	36.957	4.997	0.0	0.0	0.0
66-67	11.144	52.912	64.056	29.902	2.722	32.624	4.273	0.0	0.0	33.289
67-68	7.339	29.693	37.032	41.840	5.515	47.355	4.166	0.0	-14.654	0.0
68-69	8.612	26.229	34.841	34.379	2.631	37.010	4.287	0.0	0.0	0.0
69-70	8.907	41.951	50.858	28.192	1.511	29.702	4.485	0.0	0.0	3.897
70-71	12.782	73.293	86.075	25.548	0.0	25.548	4.465	0.0	0.0	49.150
71-72	10.599	59.324	69.923	28.362	1.405	29.767	4.556	0.0	0.0	37.158
72-73	7.968	35.400	43.368	32.797	3.646	36.443	4.218	0.0	-3.431	10.050
73-74	11.492	51.358	62.850	30.381	1.775	32.156	4.433	0.0	0.0	37.471
74-75	12.090	61.803	73.893	24.987	1.992	26.979	4.494	0.0	0.0	26.336
75-76	8.251	38.916	47.167	34.439	1.687	36.126	4.429	0.0	0.0	17.368
76-77	11.496	52.280	63.776	21.494	0.0	21.494	4.474	0.0	0.0	27.296
77-78	9.031	54.757	63.788	25.974	1.108	27.082	4.610	0.0	0.0	31.253
78-79	7.857	41.962	49.819	33.747	2.118	35.865	4.773	0.0	0.0	21.625
79-80	15.382	52.996	68.378	23.093	0.325	23.418	4.489	0.0	0.0	28.027
80-81	9.744	63.825	73.569	35.790	3.751	39.541	4.259	0.0	-6.659	48.982
81-82	10.864	56.660	67.524	29.761	0.514	30.275	4.563	0.0	0.0	20.130
82-83	6.118	34.825	40.943	34.848	4.980	39.828	4.041	0.0	-8.777	5.851
83-84	9.236	69.011	78.247	30.744	4.007	34.751	4.420	0.0	0.0	45.893
AVE.	10.292	48.977	59.270	29.767	1.842	31.609	4.462	0.0	-1.197	24.638

TABLE E3-11

SUMMARY TABLE OF RESERVOIR OPERATION FOR BAYONGAN DAM

CASE II-2 (CROPPING INTENSITY 170%)

* RESERVOIR CAPACITY 27.54 (MCM)

* MAIN CANAL CAPACITY 2.13 (CU.M/S)

UNIT=(MCM)

YEAR	<--- I N F L O W --->	<--- I R R I G A T . --->	D E M A N D	TOTAL	INTAKE	EVAP	LOSS	SHORT	SPILL	
	C.AREA	MALINAO	TOTAL	CAPAYAS	TOTAL	INTAKE	EVAP	LOSS	SHORT	SPILL
56-57	13.675	61.438	75.113	31.820	1.051	32.871	4.343	0.0	0.0	38.616
57-58	7.021	23.815	30.836	36.133	2.370	38.503	4.152	0.0	0.0	5.062
58-59	9.814	33.697	43.511	30.432	0.020	30.452	5.023	0.0	0.0	0.0
59-60	9.366	35.144	44.510	30.990	1.133	32.123	4.447	0.0	0.0	8.117
60-61	10.569	46.071	56.639	29.163	1.279	30.442	4.462	0.0	0.0	11.996
61-62	11.978	58.516	70.494	18.055	0.0	18.055	4.450	0.0	0.0	47.988
62-63	12.777	69.986	82.763	25.965	0.918	26.883	4.423	0.0	0.0	51.457
63-64	9.867	42.222	52.089	32.746	1.700	34.446	4.569	0.0	0.0	20.626
64-65	15.346	64.425	79.771	29.529	2.225	31.754	4.566	0.0	0.0	48.924
65-66	8.856	38.862	47.718	37.195	2.085	39.280	4.843	0.0	0.0	0.0
66-67	11.144	52.912	64.056	31.060	2.722	33.782	4.233	0.0	0.0	30.001
67-68	7.339	29.693	37.032	43.673	5.843	49.516	3.984	0.0	-16.634	0.0
68-69	8.612	26.229	34.841	36.526	3.050	39.576	4.086	0.0	-0.325	0.0
69-70	8.907	41.951	50.858	29.707	1.511	31.218	4.978	0.0	0.0	0.0
70-71	12.782	73.293	86.075	26.964	0.0	26.964	4.453	0.0	0.0	47.595
71-72	10.599	59.324	69.923	29.794	1.405	31.199	4.540	0.0	0.0	35.742
72-73	7.968	35.400	43.368	34.982	4.185	39.167	3.772	0.0	-5.522	9.863
73-74	11.492	51.358	62.850	31.835	1.775	33.609	4.472	0.0	0.0	35.977
74-75	12.090	61.803	73.893	25.964	1.992	27.956	4.504	0.0	0.0	25.349
75-76	8.251	38.916	47.167	36.058	1.856	37.914	4.420	0.0	0.0	15.744
76-77	11.496	52.280	63.776	22.571	0.048	22.619	4.476	0.0	0.0	26.014
77-78	9.031	54.757	63.788	27.483	1.108	28.591	4.596	0.0	0.0	29.758
78-79	7.857	41.962	49.819	35.726	2.441	38.167	4.775	0.0	0.0	19.321
79-80	15.382	52.996	68.378	24.670	0.511	25.181	4.446	0.0	0.0	26.306
80-81	9.744	63.825	73.569	36.918	3.867	40.805	4.236	0.0	-6.784	47.866
81-82	10.864	56.660	67.524	31.442	0.683	32.125	4.595	0.0	0.0	18.249
82-83	6.118	34.825	40.943	37.568	5.697	43.265	3.539	0.0	-11.495	5.633
83-84	9.236	69.011	78.247	31.500	4.007	35.507	4.419	0.0	0.0	45.138
AVE.	10.292	48.977	59.270	31.302	1.982	33.285	4.422	0.0	-1.456	23.262

TABLE E3-12

SUMMARY TABLE OF RESERVOIR OPERATION FOR BAYONGAN DAM

(CASE II-3 (CROPPING INTENSITY 180%))

* RESERVOIR CAPACITY 27.54 (MCM)

* MAIN CANAL CAPACITY 2.13 (CU.M/S)

UNIT=(MCM)

YEAR	<--- I N F L O W --->	<--- D I R I G A T I O N --->	<--- D E M A N D --->	TOTAL	INTAKE	EVAPO	LOSS	SHORT	SPILL		
	C.AREA	MALINAO	TOTAL	IRRIGAT.	CAPAYAS	TOTAL	INTAKE	EVAPO	LOSS	SHORT	SPILL
56-57	13.675	61.438	75.113	33.171	1.051	34.222	34.222	4.349	0.0	0.0	37.259
57-58	7.021	23.815	30.836	38.075	2.788	40.863	40.863	4.295	0.0	0.0	2.808
58-59	9.814	33.697	43.511	32.039	0.020	32.059	32.059	4.740	0.0	0.0	0.0
59-60	9.366	35.144	44.510	32.902	1.133	34.035	34.035	4.313	0.0	0.0	4.766
60-61	10.569	46.071	56.639	30.467	1.464	31.931	31.931	4.499	0.0	0.0	10.470
61-62	11.978	58.516	70.494	19.238	0.0	19.238	19.238	4.448	0.0	0.0	46.807
62-63	12.777	69.986	82.763	27.265	0.923	28.188	28.188	4.419	0.0	0.0	50.156
63-64	9.867	42.222	52.089	34.744	2.132	36.876	36.876	4.591	0.0	0.0	18.173
64-65	15.346	64.425	79.771	30.593	2.225	32.818	32.818	4.572	0.0	0.0	47.854
65-66	8.856	38.862	47.718	39.273	2.516	41.789	41.789	4.272	0.0	0.0	0.0
66-67	11.144	52.912	64.056	32.257	2.722	34.979	34.979	4.326	0.0	0.0	26.774
67-68	7.339	29.693	37.032	45.627	6.152	51.779	33.054	3.812	0.0	-18.726	0.0
68-69	8.612	26.229	34.841	38.761	3.502	42.263	39.307	4.031	0.0	-2.956	0.0
69-70	8.907	41.951	50.858	31.331	1.583	32.914	32.914	5.225	0.0	0.0	0.0
70-71	12.782	73.293	86.075	28.466	0.0	28.466	28.466	4.447	0.0	0.0	44.156
71-72	10.599	59.324	69.923	31.318	1.423	32.741	32.741	4.574	0.0	0.0	34.181
72-73	7.968	35.400	43.368	37.297	4.779	42.076	34.352	3.282	0.0	-7.724	9.631
73-74	11.492	51.358	62.850	33.388	1.775	35.163	35.163	4.454	0.0	0.0	34.443
74-75	12.090	61.803	73.893	26.956	1.992	28.948	28.948	4.534	0.0	0.0	24.327
75-76	8.251	38.916	47.167	37.758	2.037	39.795	39.795	4.446	0.0	0.0	14.037
76-77	11.496	52.280	63.776	23.682	0.138	23.820	23.820	4.460	0.0	0.0	24.629
77-78	9.031	54.757	63.788	29.070	1.108	30.178	30.178	4.595	0.0	0.0	28.172
78-79	7.857	41.962	49.819	37.815	2.912	40.727	40.727	4.715	0.0	0.0	16.821
79-80	15.382	52.996	68.378	26.292	0.703	26.995	26.995	4.455	0.0	0.0	24.483
80-81	9.744	63.825	73.569	38.096	4.045	42.141	35.214	4.210	0.0	-6.928	46.699
81-82	10.864	56.660	67.524	33.305	1.056	34.361	34.361	4.566	0.0	0.0	16.042
82-83	6.118	34.825	40.943	40.405	6.500	46.905	32.678	2.933	0.0	-14.276	5.380
83-84	9.236	69.011	78.247	32.288	4.007	36.295	36.295	4.419	0.0	0.0	44.350
AVE.	10.292	48.977	59.270	32.924	2.167	35.092	33.286	4.356	0.0	-1.807	21.872

TABLE E3-13

SUMMARY TABLE OF RESERVOIR OPERATION FOR BAYONGAN DAM

(CASE II-4 (CROPPING INTENSITY 190%))

* RESERVOIR CAPACITY 27.54 (MCM)
 * MAIN CANAL CAPACITY 2.13 (CU.M/S)

UNIT=(MCM)

YEAR	<--- I N F L O W --->	<--- I R R I G A T . --->	D E M A N D	TOTAL	INTAKE	EVAPO	LOSS	SHORT	SPILL
	C.AREA	TOTAL	CAPAYAS	TOTAL					
56-57	13.675	61.438	75.113	34.638	1.051	35.689	4.352	0.0	35.789
57-58	7.021	23.815	30.836	40.169	3.227	43.396	4.172	-0.974	2.293
58-59	9.814	33.697	43.511	33.764	0.207	33.971	4.141	-1.709	0.0
59-60	9.366	35.144	44.510	34.973	1.133	36.106	4.442	0.0	2.041
60-61	10.569	46.071	56.639	31.894	1.687	33.581	4.554	0.0	8.859
61-62	11.978	58.516	70.494	20.551	0.0	20.551	4.469	0.0	45.379
62-63	12.777	69.986	82.763	28.687	0.945	29.632	4.413	0.0	48.718
63-64	9.867	42.222	52.089	36.900	2.533	39.433	4.606	0.0	15.601
64-65	15.346	64.425	79.771	31.747	2.225	33.972	4.566	0.0	46.706
65-66	8.856	38.862	47.718	41.529	2.909	44.438	3.641	-0.729	0.0
66-67	11.144	52.912	64.056	33.576	2.722	36.298	4.294	0.0	24.199
67-68	7.339	29.693	37.032	47.744	6.508	54.252	4.087	0.0	0.0
68-69	8.612	26.229	34.841	41.214	3.920	45.134	4.577	-21.473	0.0
69-70	8.907	41.951	50.858	33.085	1.858	34.943	5.092	-6.374	0.0
70-71	12.782	73.293	86.075	30.097	0.0	30.097	4.468	0.0	40.607
71-72	10.599	59.324	69.923	32.970	1.680	34.650	4.570	0.0	32.304
72-73	7.968	35.400	43.368	39.813	5.309	45.122	3.052	-10.316	9.379
73-74	11.492	51.358	62.850	35.068	1.811	36.879	4.433	0.0	32.747
74-75	12.090	61.803	73.893	28.061	1.992	30.053	4.525	0.0	23.232
75-76	8.251	38.916	47.167	39.615	2.221	41.836	4.431	0.0	12.176
76-77	11.496	52.280	63.776	24.908	0.217	25.125	4.427	0.0	23.192
77-78	9.031	54.757	63.788	30.802	1.108	31.910	4.578	0.0	26.456
78-79	7.857	41.962	49.819	40.090	3.398	43.488	4.813	0.0	13.961
79-80	15.382	52.996	68.378	28.085	0.903	28.988	4.460	0.0	22.485
80-81	9.744	63.825	73.569	39.388	4.193	43.581	4.198	-7.063	45.407
81-82	10.864	56.660	67.524	35.280	1.416	36.696	4.568	0.0	13.705
82-83	6.118	34.825	40.943	43.516	7.218	50.734	2.806	-17.716	5.118
83-84	9.236	69.011	78.247	33.153	4.007	37.160	4.418	0.0	43.486
AVE.	10.292	48.977	59.270	34.690	2.371	37.061	4.327	-2.370	20.494

TABLE E3-14

SUMMARY TABLE OF RESERVOIR OPERATION FOR BAYONGAN DAM

(CASE II-5 (CROPPING INTENSITY 200%))

* RESERVOIR CAPACITY 27.54 (MCM)
 * MAIN CANAL CAPACITY 2.13 (CU.M/S)

UNIT=(MCM)

YEAR	C.AREA	I N F L O W	TOTAL	IRRIGAT.	D E M A N D	TOTAL	INTAKE	EVAP0	LOSS	SHORT	SPILL
56-57	13.675	61.438	75.113	35.832	1.051	36.883	36.883	4.345	0.0	0.0	34.601
57-58	7.021	23.815	30.836	41.880	3.752	45.632	42.601	4.128	0.0	-3.031	2.159
58-59	9.814	33.697	43.511	35.174	0.617	35.791	32.434	4.042	0.0	-3.357	0.0
59-60	9.366	35.144	44.510	36.660	1.331	37.991	37.991	5.017	0.0	0.0	0.0
60-61	10.569	46.071	56.639	33.050	1.950	35.000	35.000	4.496	0.0	0.0	7.094
61-62	11.978	58.516	70.494	21.609	0.0	21.609	21.609	4.477	0.0	0.0	44.223
62-63	12.777	69.986	82.763	29.842	1.051	30.893	30.893	4.401	0.0	0.0	47.469
63-64	9.867	42.222	52.089	38.660	2.981	41.641	41.641	4.649	0.0	0.0	13.350
64-65	15.346	64.425	79.771	32.689	2.225	34.914	34.914	4.576	0.0	0.0	45.754
65-66	8.856	38.862	47.718	43.365	3.353	46.718	43.775	3.575	0.0	-2.943	0.0
66-67	11.144	52.912	64.056	34.643	2.724	37.367	37.367	4.314	0.0	0.0	23.111
67-68	7.339	29.693	37.032	49.470	6.899	56.369	33.027	3.838	0.0	-23.342	0.0
68-69	8.612	26.229	34.841	43.201	4.338	47.539	39.172	4.166	0.0	-8.368	0.0
69-70	8.907	41.951	50.858	34.517	2.227	36.744	36.744	4.678	0.0	0.0	0.0
70-71	12.782	73.293	86.075	31.424	0.0	31.424	31.424	4.448	0.0	0.0	37.915
71-72	10.599	59.324	69.923	34.315	1.960	36.275	36.275	4.549	0.0	0.0	30.728
72-73	7.968	35.400	43.368	41.860	5.905	47.764	35.375	2.671	0.0	-12.390	9.164
73-74	11.492	51.358	62.850	36.439	2.044	38.483	38.483	4.427	0.0	0.0	31.149
74-75	12.090	61.803	73.893	28.949	1.992	30.941	30.941	4.530	0.0	0.0	22.338
75-76	8.251	38.916	47.167	41.122	2.388	43.510	43.510	4.642	0.0	0.0	10.670
76-77	11.496	52.280	63.776	25.898	0.308	26.206	26.206	4.385	0.0	0.0	21.774
77-78	9.031	54.757	63.788	32.209	1.211	33.420	33.420	4.583	0.0	0.0	24.941
78-79	7.857	41.962	49.819	41.940	3.950	45.890	45.890	4.912	0.0	0.0	11.461
79-80	15.382	52.996	68.378	29.532	1.128	30.660	30.660	4.418	0.0	0.0	20.855
80-81	9.744	63.825	73.569	40.433	4.348	44.781	37.577	4.170	0.0	-7.204	44.377
81-82	10.864	56.660	67.524	36.905	1.823	38.728	38.728	4.512	0.0	0.0	11.729
82-83	6.118	34.825	40.943	46.036	8.022	54.058	33.359	2.732	0.0	-20.748	4.900
83-84	9.236	69.011	78.247	33.853	4.007	37.860	37.860	4.444	0.0	0.0	42.760
AVE.	10.292	48.977	59.270	36.125	2.628	38.753	35.848	4.290	0.0	-2.907	19.376

TABLE E3-15 SUMMARY TABLE OF RESERVOIR OPERATION FOR BAYONGAN DAM

(CASE III-1 (CROPPING INTENSITY 170%))

* RESERVOIR CAPACITY 30.00 (MCM)
 * MAIN CANAL CAPACITY 2.13 (CU.M/S)

UNIT=(MCM)

YEAR	I N F L O W	TOTAL	IRRIGAT.	D E M A N D	TOTAL	INTAKE	EVAP0	LOSS	SHORT	SPILL
56-57	13.675	61.438	75.113	31.820	1.051	32.871	4.718	0.0	0.0	38.325
57-58	7.021	23.815	30.836	36.133	2.370	38.503	4.585	0.0	0.0	4.805
58-59	9.814	33.697	43.511	30.432	0.020	30.452	5.242	0.0	0.0	0.0
59-60	9.366	35.144	44.510	30.990	1.133	32.123	4.639	0.0	0.0	7.500
60-61	10.569	46.071	56.639	29.163	1.279	30.442	4.703	0.0	0.0	11.701
61-62	11.978	58.516	70.494	18.055	0.0	18.055	4.868	0.0	0.0	47.571
62-63	12.777	69.986	82.763	25.965	0.918	26.883	4.783	0.0	0.0	51.096
63-64	9.867	42.222	52.089	32.746	1.700	34.446	4.797	0.0	0.0	20.443
64-65	15.346	64.425	79.771	29.529	2.225	31.754	4.747	0.0	0.0	48.639
65-66	8.856	38.862	47.718	37.195	2.085	39.280	4.716	0.0	0.0	0.0
66-67	11.144	52.912	64.056	31.060	2.722	33.782	4.706	0.0	0.0	29.938
67-68	7.339	29.693	37.032	43.673	5.843	49.516	4.059	0.0	-14.473	0.0
68-69	8.612	26.229	34.841	36.526	3.050	39.576	4.086	0.0	-0.325	0.0
69-70	8.907	41.951	50.858	29.707	1.511	31.218	4.978	0.0	0.0	0.0
70-71	12.782	73.293	86.075	26.964	0.0	26.964	4.748	0.0	0.0	44.840
71-72	10.599	59.324	69.923	29.794	1.405	31.199	4.614	0.0	0.0	35.463
72-73	7.968	35.400	43.368	34.982	4.185	39.167	4.248	0.0	-3.492	10.022
73-74	11.492	51.358	62.850	31.835	1.775	33.609	4.966	0.0	0.0	33.319
74-75	12.090	61.803	73.893	25.964	1.992	27.956	4.833	0.0	0.0	24.897
75-76	8.251	38.916	47.167	36.058	1.856	37.914	4.710	0.0	0.0	15.430
76-77	11.496	52.280	63.776	22.571	0.048	22.619	4.705	0.0	0.0	25.611
77-78	9.031	54.757	63.788	27.483	1.108	28.591	4.691	0.0	0.0	29.688
78-79	7.857	41.962	49.819	35.726	2.441	38.167	4.750	0.0	0.0	19.153
79-80	15.382	52.996	68.378	24.670	0.511	25.181	4.607	0.0	0.0	26.338
80-81	9.744	63.825	73.569	36.918	3.887	40.805	4.374	0.0	-4.234	47.639
81-82	10.864	56.660	67.524	31.442	0.683	32.125	4.605	0.0	0.0	15.778
82-83	6.118	34.825	40.943	37.568	5.697	43.265	4.014	0.0	-9.455	3.117
83-84	9.236	69.011	78.247	31.500	4.007	35.507	4.786	0.0	0.0	44.873
AVE.	10.292	48.977	59.270	31.302	1.982	33.285	4.653	0.0	-1.142	22.721

TABLE E3-16

SUMMARY TABLE OF RESERVOIR OPERATION FOR BAYONGAN DAM

(CASE III-2 (CROPPING INTENSITY 180%))

* RESERVOIR CAPACITY 30.00 (MCM)
 * MAIN CANAL CAPACITY 2.13 (CU.M/S)

UNIT=(MCM)

YEAR	<--- I N F L O W --->	<--- D E M A N D --->	IRRIGAT.	CAPAYAS	TOTAL	INTAKE	EVAP0	LOSS	SHORT	SPILL
56-57	13.675	61.438	75.113	33.171	1.051	34.222	4.709	0.0	0.0	36.983
57-58	7.021	23.815	30.836	38.075	2.788	40.863	4.469	0.0	0.0	2.796
58-59	9.814	33.697	43.511	32.039	0.020	32.059	5.324	0.0	0.0	0.0
59-60	9.366	35.144	44.510	32.902	1.133	34.035	4.549	0.0	0.0	3.754
60-61	10.569	46.071	56.639	30.467	1.464	31.931	4.674	0.0	0.0	10.240
61-62	11.978	58.516	70.494	19.238	0.0	19.238	4.866	0.0	0.0	46.390
62-63	12.777	69.986	82.763	27.265	0.923	28.188	4.792	0.0	0.0	49.783
63-64	9.867	42.222	52.089	34.744	2.132	36.876	4.770	0.0	0.0	18.039
64-65	15.346	64.425	79.771	30.593	2.225	32.818	4.741	0.0	0.0	47.581
65-66	8.856	38.862	47.718	39.273	2.516	41.789	4.925	0.0	0.0	0.0
66-67	11.144	52.912	64.056	32.257	2.722	34.979	4.632	0.0	0.0	26.098
67-68	7.339	29.693	37.032	45.627	6.152	51.779	3.996	0.0	-16.674	0.0
68-69	8.612	26.229	34.841	38.761	3.502	42.263	4.031	0.0	-2.956	0.0
69-70	8.907	41.951	50.858	31.331	1.583	32.914	5.225	0.0	0.0	0.0
70-71	12.782	73.293	86.075	28.466	0.0	28.466	4.753	0.0	0.0	41.390
71-72	10.599	59.324	69.923	31.318	1.423	32.741	4.606	0.0	0.0	33.944
72-73	7.968	35.400	43.368	37.297	4.779	42.076	3.807	0.0	-5.743	9.789
73-74	11.492	51.358	62.850	33.388	1.775	35.163	4.950	0.0	0.0	31.782
74-75	12.090	61.803	73.893	26.956	1.992	28.948	4.826	0.0	0.0	23.912
75-76	8.251	38.916	47.167	37.758	2.037	39.795	4.676	0.0	0.0	13.749
76-77	11.496	52.280	63.776	23.682	0.138	23.820	4.687	0.0	0.0	24.262
77-78	9.031	54.757	63.788	29.070	1.108	30.178	4.690	0.0	0.0	28.102
78-79	7.857	41.962	49.819	37.815	2.912	40.727	4.647	0.0	0.0	16.695
79-80	15.382	52.996	68.378	26.292	0.703	26.995	4.588	0.0	0.0	24.544
80-81	9.744	63.825	73.569	38.096	4.045	42.141	4.407	0.0	-4.423	46.457
81-82	10.864	56.660	67.524	33.305	1.056	34.361	4.573	0.0	0.0	13.575
82-83	6.118	34.825	40.943	40.405	6.500	46.905	3.535	0.0	-12.362	2.864
83-84	9.236	69.011	78.247	32.288	4.007	36.295	4.786	0.0	0.0	44.085
AVE.	10.292	48.977	59.270	32.924	2.167	35.092	4.615	0.0	-1.506	21.315

TABLE E3-17

SUMMARY TABLE OF RESERVOIR OPERATION FOR BAYONGAN DAM

(CASE III-3 (CROPPING INTENSITY 190%))

* RESERVOIR CAPACITY 30.00 (MCM)

* MAIN CANAL CAPACITY 2.13 (CU.M/S)

UNIT=(MCM)

YEAR	C.AREA	I N F L O W	TOTAL	IRRIGAT.	D E M A N D	TOTAL	INTAKE	EVAP0	LOSS	SHORT	SPILL
56-57	13.675	61.438	75.113	34.638	1.051	35.689	35.689	4.711	0.0	0.0	35.514
57-58	7.021	23.815	30.836	40.169	3.227	43.396	43.396	4.376	0.0	0.0	2.198
58-59	9.814	33.697	43.511	33.764	0.207	33.971	33.285	4.410	0.0	-0.685	0.0
59-60	9.366	35.144	44.510	34.973	1.133	36.106	36.106	4.527	0.0	0.0	0.0
60-61	10.569	46.071	56.639	31.894	1.687	33.581	33.581	4.625	0.0	0.0	8.330
61-62	11.978	58.516	70.494	20.551	0.0	20.551	20.551	4.861	0.0	0.0	44.941
62-63	12.777	69.986	82.763	28.687	0.945	29.632	29.632	4.786	0.0	0.0	48.345
63-64	9.867	42.222	52.089	36.900	2.533	39.433	39.433	4.753	0.0	0.0	15.500
64-65	15.346	64.425	79.771	31.747	2.225	33.972	33.972	4.747	0.0	0.0	46.421
65-66	8.856	38.862	47.718	41.529	2.909	44.438	44.438	4.353	0.0	0.0	0.0
66-67	11.144	52.912	64.056	33.576	2.722	36.298	36.298	4.727	0.0	0.0	22.608
67-68	7.339	29.693	37.032	47.744	6.508	54.252	35.400	3.702	0.0	-18.852	0.0
68-69	8.612	26.229	34.841	41.214	3.920	45.134	38.761	4.577	0.0	-6.374	0.0
69-70	8.907	41.951	50.858	33.085	1.858	34.943	34.943	5.092	0.0	0.0	0.0
70-71	12.782	73.293	86.075	30.097	0.0	30.097	30.097	4.750	0.0	0.0	37.865
71-72	10.599	59.324	69.923	32.970	1.680	34.650	34.650	4.591	0.0	0.0	32.080
72-73	7.968	35.400	43.368	39.813	5.309	45.122	37.070	3.294	0.0	-8.052	9.536
73-74	11.492	51.358	62.850	35.068	1.811	36.879	36.879	4.942	0.0	0.0	30.073
74-75	12.090	61.803	73.893	28.061	1.992	30.053	30.053	4.818	0.0	0.0	22.816
75-76	8.251	38.916	47.167	39.615	2.221	41.836	41.836	4.646	0.0	0.0	11.905
76-77	11.496	52.280	63.776	24.908	0.217	25.125	25.125	4.654	0.0	0.0	22.823
77-78	9.031	54.757	63.788	30.802	1.108	31.910	31.910	4.707	0.0	0.0	26.353
78-79	7.857	41.962	49.819	40.090	3.398	43.488	43.488	4.634	0.0	0.0	13.947
79-80	15.382	52.996	68.378	28.085	0.903	28.988	28.988	4.557	0.0	0.0	22.582
80-81	9.744	63.825	73.569	39.388	4.193	43.581	39.022	4.389	0.0	-4.559	45.173
81-82	10.864	56.660	67.524	35.280	1.416	36.696	36.696	4.542	0.0	0.0	11.271
82-83	6.118	34.825	40.943	43.516	7.218	50.734	35.429	2.960	0.0	-15.354	2.603
83-84	9.236	69.011	78.247	33.153	4.007	37.160	37.160	4.785	0.0	0.0	43.221
AVE.	10.292	48.977	59.270	34.690	2.371	37.061	35.139	4.518	0.0	-1.924	19.861

TABLE E3-18 ANNUAL AVERAGE IRRIGATION AREA IN EACH ALTERNATIVE PLAN
(RESERVOIR CAPACITY: 25.0 MCM)

Alter- native Plan	Proposed Cropping Intensity (%)	Reservoir Capacity (MCM)	1st Crop (Dry season) Irrigation Area			2nd Crop (Wet season) Irrigation Area			Annual Average Irriga- tion Area (ha)
			Inten- sity (%)	Time	Area (ha)	Inten- sity (%)	Time	Area (ha)	
Case I-1	160	25.0	60	28	89,040	100	24	127,200	
						20	1	1,060	
						15	1	795	
						10	1	530	
						0	1	0	
Average				28	3,180		28	4,630	7,810
Case I-2	170	25.0	70	28	103,880	100	24	127,200	
						20	1	1,060	
						15	1	795	
						10	1	530	
						0	1	0	
Average				28	3,710		28	4,630	8,340
Case I-3	180	25.0	80	28	118,720	100	23	121,900	
						20	1	1,060	
						15	2	1,590	
						10	1	530	
						0	0	0	
Average				28	4,240		28	4,470	8,710

TABLE E3-19 ANNUAL AVERAGE IRRIGATION AREA IN EACH ALTERNATIVE PLAN
(RESERVOIR CAPACITY: 27.5 MCM)

Alter- native Plant	Proposed Cropping Intensity (%)	Reservoir Capacity (MCM)	1st Crop (Dry Season) Irrigation Area			2nd Crop (Wet Season) Irrigation Area			Annual Average Irriga- tion Area (ha)
			Inten- sity (%)	Time	Area (ha)	Inten- sity (%)	Time	Area (ha)	
Case II-1	160	27.5	60	28	89,040	100	24	127,200	
						20	1	1,060	
						15	3	2,385	
Average				28	3,180		28	4,670	7,850
Case II-2	170	27.5	70	28	103,880	100	24	127,200	
						20	1	1,060	
						15	1	795	
						10	1	530	
						5	1	265	
Average				28	3,710		28	4,640	8,350
Case II-3	180	27.5	80	28	118,720	100	23	121,900	
						30	1	1,590	
						20	2	2,120	
						10	1	530	
						0	1	0	
Average				28	4,240		28	4,510	8,750
Case II-4	190	27.5	90	26	124,020	100	23	121,900	
			45	1	2,385	40	1	2,120	
			20	1	1,060	20	1	1,060	
						10	2	1,060	
						0	1	0	
Average				28	4,550		28	4,510	9,060
Case II-5	200	27.5	100	26	137,800	100	23	121,900	
			15	2	1,590	20	2	2,120	
						10	1	530	
						0	2	0	
Average				28	4,980		28	4,420	9,400