I-3 Computation Results of Drought Discharge by Hydrological Station

Drought Discharge [Return Period(10years)~ Duration Time(7days)] Unit:m3/s

No.	Basin	River	Site Name	Area [km2]	Q10.7 [m3/s]	[m3/s/100km2]
[1]	ITARARE	Joguariaiva	Tamandua	1,622	5.677	0.350
[•A]	ITARARE	Itarare	Salto do Itarare	5,187	16.844	0.325
[2]	CINZAS	Cinzas	Tomazina	2,015	3.659	0.182
[3]	CINZAS	Cinzas	Andira	5,622	6.044	0.108
[•B]	CINZAS	Cinzas	Sao Joaquim do Pontal	9,658	10.280	0.106
[4]	TIBAGI	Tibagi	Uvaia	4,450	8.288	0.186
[5]	TIBAGI	Tibagi	Tibagi	8,948	14.068	0.157
[6]	TIBAGI	Tibagi	Barra Rib.Das Antas	15,600	24.165	0.155
[7]	TIBAGI	Tibagi	Jataizinho(Extendido)	21,955	20.000	0.091
[•C]	TIBAGI	Tibagi	Primeiro de Maio	24,712	33.797	0.137
[8]	PIRAPO	Pirapo	Vila Silva Jardim	4,627	20.842	0.450
[•D]	PIRAPO	Pirapo	Jardim Olinda	5,025	17.732	0.353
[9]	IVAI	Ivai	Tereza Cristina	3,572	4.737	0.133
[10]	IVAI	Ivai	Porto Espanhol	8,600	7.766	0.090
[11]	IVAI	Ivai	Porto Bananeiras	24,200	40.462	0.167
[12]	IVAI	Ivai	Porto Paraiso do Norte	28,427	145.418	0.512
[13]	IVAI	Ivai	Novo Porto Taquara	34,432	144.981	0.421
[•E]	IVAI	Ivai	Pontal do Tigre	36,594	135.810	0.371
[14]	PIQUIRI	Piquiri	Porto Guarani	4,223	10.687	0.253
[15]	PIQUIRI	Piquiri	Ponte do Piquiri	11,303	61.641	0.545
[16]	PIQUIRI	Piquiri	Porto Formosa	17,500	99.440	0.568
[17]	PIQUIRI	Piquiri	Balsa do Santa Maria	20,982	92.380	0.440
[•F]	PIQUIRI	Piquiri	Porto Sinod	24,731	87.166	0.352
[18]	IGUACU	Iguacu	Fazendinha	110	0.588	0.535
[19]	IGUACU	Iguacu	Guajuvira	2,304	5.458	0.237
[20]	IGUACU	Iguacu	Porto Amazonas	3,662	7.307	0.200
[21]	IGUACU	Iguacu	Sao Mateus do Sul	6,065	7.137	0.118
[22]	IGUACU	Iguacu	Uniao da Vitoria	24,211	82.293	0.340
[23]	IGUACU	Iguacu	Salto Osorio	45,824	99.656	0.217
[24]	IGUACU	Iguacu	Salto Cataratas	67,317	186.977	0.278
[25]	IGUACU	Negro	Divisa	7,970	9.816	0.123
[26]	IGUACU	Timbo	Foz do Cachdeira	693	0.641	0.093
[27]	IGUACU	Jordao	Santa Clara	3,913	12.818	0.328
[28]	IGUACU	Chopim	Aguas do Vere	6,696	10.427	0.156
[•G]	IGUACU	Iguacu	Porto Meira	55,048	149.405	0.271
[29]	RIBEIRA	Ribeira	Capela do Ribeira	7,252	42.558	0.587
[•H]	RIBEIRA	Ribeira	Iporanga	9,129	52.424	0.574
[30]	Litoranea	-------	Morretes-1	217	1.329	0.612
[31]	Litoranea	-------	Morretes-2	53	0.327	0.618
[Ex]	TIBAGI	Tibagi	Example	369	0.560	0.152

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [1] ITARARE
River : Joguariaiva
Site : Tamandua
C.A. = 1,622 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	8.820	9.197	9.838	10.821	11.590	12.238	12.809	13.323
3	7.536	7.859	8.406	9.246	9.903	10.457	10.945	11.384
4	6.910	7.205	7.707	8.477	9.080	9.588	10.035	10.438
5	6.524	6.803	7.277	8.003	8.572	9.052	9.474	9.854
6	6.256	6.524	6.978	7.676	8.221	8.681	9.086	9.450
7	6.058	6.317	6.757	7.432	7.960	8.406	8.798	9.151
8	5.904	6.156	6.585	7.243	7.757	8.192	8.573	8.918
9	5.779	6.027	6.447	7.091	7.594	8.019	8.393	8.730
10	5.677	5.920	6.332	6.965	7.459	7.877	8.244	8.575
15	5.345	5.574	5.962	6.557	7.023	7.416	7.762	8.074
20	5.158	5.379	5.754	6.329	6.778	7.158	7.491	7.792
25	5.036	5.252	5.618	6.179	6.618	6.988	7.314	7.607
30	4.949	5.160	5.520	6.071	6.502	6.866	7.186	7.475
35	4.882	5.091	5.446	5.990	6.415	6.774	7.090	7.374
40	4.829	5.036	5.387	5.925	6.346	6.701	7.013	7.295
45	4.786	4.991	5.339	5.872	6.289	6.642	6.951	7.230
50	4.751	4.954	5.299	5.828	6.242	6.592	6.899	7.176
60	4.694	4.895	5.236	5.759	6.168	6.513	6.817	7.091
70	4.651	4.850	5.188	5.706	6.112	6.454	6.754	7.026
80	4.617	4.814	5.150	5.664	6.067	6.406	6.705	6.974
90	4.589	4.785	5.119	5.630	6.030	6.368	6.664	6.932
100	4.566	4.761	5.093	5.602	6.000	6.335	6.631	6.897

A = 1.80 Alpha = 0.45
B = -0.08 Beta = 1.064
C = 0.029 Gamma = 1.64

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [*A] ITARARE
River : Itarare
Site : Salto do Itarare
C.A. = 5,187 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	24.636	26.228	28.822	32.818	35.996	38.721	41.149	43.364
3	21.441	22.828	25.085	28.563	31.329	33.701	35.814	37.741
4	19.887	21.173	23.267	26.493	29.058	31.258	33.218	35.006
5	18.931	20.155	22.148	25.219	27.662	29.755	31.621	33.323
6	18.271	19.452	21.376	24.340	26.697	28.718	30.518	32.161
7	17.782	18.931	20.803	23.688	25.982	27.949	29.701	31.300
8	17.402	18.527	20.359	23.182	25.427	27.351	29.066	30.630
9	17.096	18.201	20.001	22.774	24.980	26.871	28.555	30.092
10	16.844	17.932	19.706	22.438	24.611	26.474	28.134	29.648
15	16.029	17.065	18.752	21.352	23.420	25.193	26.773	28.214
20	15.572	16.579	18.219	20.745	22.754	24.476	26.011	27.411
25	15.274	16.261	17.869	20.347	22.317	24.007	25.512	26.885
30	15.060	16.033	17.619	20.062	22.005	23.671	25.155	26.509
35	14.898	15.861	17.429	19.846	21.768	23.416	24.884	26.223
40	14.770	15.725	17.279	19.675	21.581	23.214	24.670	25.998
45	14.665	15.614	17.158	19.537	21.429	23.051	24.496	25.814
50	14.579	15.521	17.056	19.421	21.302	22.914	24.351	25.661
60	14.441	15.375	16.895	19.238	21.101	22.698	24.122	25.420
70	14.337	15.264	16.773	19.099	20.949	22.534	23.947	25.236
80	14.254	15.176	16.677	18.989	20.828	22.405	23.809	25.091
90	14.187	15.104	16.598	18.899	20.730	22.299	23.697	24.972
100	14.131	15.045	16.532	18.825	20.648	22.211	23.603	24.874

A = 1.65 Alpha = 0.51
B = -0.09 Beta = 1.055
C = 0.037 Gamma = 1.62

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [2] CINZAS
River : Cinzas
Site : Tomazina
C.A. = 2,015 km2

TR	Duration[days]							
[years]	7	15	30	60	90	120	150	180
2	7.688	8.272	9.345	11.131	12.635	13.977	15.210	16.364
3	5.999	6.454	7.291	8.684	9.858	10.905	11.867	12.768
4	5.193	5.587	6.312	7.518	8.534	9.440	10.273	11.053
5	4.704	5.061	5.717	6.810	7.730	8.551	9.305	10.012
6	4.370	4.701	5.311	6.326	7.181	7.943	8.644	9.300
7	4.124	4.437	5.013	5.970	6.777	7.497	8.158	8.777
8	3.934	4.233	4.782	5.696	6.466	7.152	7.783	8.374
9	3.783	4.070	4.598	5.477	6.217	6.877	7.484	8.052
10	3.659	3.936	4.447	5.297	6.012	6.651	7.238	7.787
15	3.262	3.509	3.964	4.722	5.360	5.929	6.452	6.942
20	3.043	3.274	3.699	4.405	5.001	5.532	6.020	6.477
25	2.901	3.122	3.527	4.200	4.768	5.275	5.740	6.175
30	2.801	3.014	3.405	4.055	4.603	5.092	5.541	5.962
35	2.726	2.932	3.313	3.946	4.479	4.955	5.392	5.801
40	2.666	2.869	3.241	3.860	4.382	4.847	5.275	5.675
45	2.618	2.817	3.183	3.791	4.303	4.760	5.180	5.573
50	2.579	2.774	3.134	3.733	4.238	4.688	5.101	5.489
60	2.516	2.707	3.059	3.643	4.135	4.574	4.978	5.356
70	2.469	2.657	3.001	3.575	4.058	4.489	4.885	5.256
80	2.432	2.617	2.956	3.521	3.997	4.422	4.812	5.177
90	2.402	2.585	2.920	3.478	3.948	4.367	4.752	5.113
100	2.377	2.558	2.890	3.442	3.907	4.322	4.703	5.060

A = 1.54 Alpha = 0.24
B = -0.16 Beta = 1.090
C = 0.055 Gamma = 1.51

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [3] CINZAS
River : Cinzas
Site : Andira
C.A. = 5,622 km2

TR	Duration[days]							
[years]	7	15	30	60	90	120	150	180
2	11.448	11.907	13.405	16.329	19.008	21.521	23.919	26.234
3	8.997	9.358	10.535	12.833	14.938	16.913	18.797	20.617
4	7.911	8.229	9.264	11.284	13.136	14.872	16.529	18.129
5	7.284	7.576	8.530	10.390	12.095	13.694	15.220	16.692
6	6.872	7.147	8.046	9.801	11.410	12.918	14.357	15.747
7	6.577	6.841	7.702	9.382	10.921	12.365	13.743	15.073
8	6.356	6.611	7.443	9.066	10.554	11.949	13.281	14.566
9	6.183	6.431	7.241	8.820	10.267	11.624	12.919	14.170
10	6.044	6.287	7.077	8.621	10.036	11.362	12.628	13.851
15	5.618	5.843	6.578	8.013	9.328	10.561	11.738	12.874
20	5.397	5.613	6.320	7.698	8.961	10.146	11.276	12.368
25	5.260	5.471	6.159	7.503	8.734	9.888	10.990	12.054
30	5.166	5.373	6.050	7.369	8.578	9.712	10.794	11.839
35	5.098	5.302	5.969	7.271	8.464	9.583	10.651	11.682
40	5.045	5.247	5.908	7.196	8.377	9.484	10.541	11.561
45	5.003	5.204	5.859	7.137	8.308	9.406	10.454	11.466
50	4.969	5.169	5.819	7.088	8.251	9.342	10.383	11.388
60	4.917	5.115	5.758	7.014	8.165	9.244	10.274	11.269
70	4.879	5.075	5.714	6.960	8.102	9.173	10.195	11.181
80	4.850	5.045	5.679	6.918	8.053	9.117	10.133	11.114
90	4.827	5.020	5.652	6.885	8.014	9.074	10.085	11.061
100	4.808	5.001	5.630	6.858	7.983	9.038	10.045	11.018

A = 1.21 Alpha = 0.34
B = -0.33 Beta = 1.025
C = 0.082 Gamma = 1.21

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [*B] CINZAS
River : Cinzas
Site : Sao Joaquim do Pontal
C.A. = 9,658 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	20.873	21.588	24.351	29.919	35.114	40.043	44.790	49.407
3	16.181	16.736	18.877	23.194	27.221	31.042	34.722	38.301
4	14.055	14.536	16.396	20.146	23.644	26.963	30.159	33.268
5	12.808	13.246	14.941	18.358	21.546	24.570	27.483	30.316
6	11.977	12.387	13.972	17.168	20.148	22.977	25.700	28.350
7	11.379	11.769	13.275	16.311	19.143	21.830	24.418	26.935
8	10.926	11.300	12.746	15.661	18.381	20.961	23.445	25.862
9	10.569	10.931	12.330	15.150	17.780	20.276	22.680	25.018
10	10.280	10.633	11.993	14.736	17.294	19.722	22.060	24.334
15	9.384	9.706	10.948	13.451	15.787	18.003	20.137	22.213
20	8.911	9.216	10.395	12.772	14.990	17.094	19.121	21.092
25	8.613	8.908	10.048	12.346	14.490	16.524	18.483	20.388
30	8.407	8.695	9.808	12.051	14.143	16.129	18.041	19.900
35	8.255	8.538	9.631	11.833	13.888	15.837	17.714	19.541
40	8.138	8.417	9.494	11.665	13.690	15.612	17.463	19.263
45	8.044	8.320	9.385	11.531	13.533	15.432	17.262	19.041
50	7.968	8.241	9.295	11.421	13.404	15.286	17.097	18.860
60	7.849	8.118	9.157	11.251	13.205	15.058	16.844	18.580
70	7.762	8.028	9.055	11.126	13.058	14.890	16.656	18.373
80	7.694	7.958	8.976	11.029	12.944	14.761	16.510	18.212
90	7.640	7.902	8.913	10.951	12.853	14.657	16.394	18.084
100	7.596	7.856	8.861	10.888	12.778	14.572	16.299	17.979

A = 1.31 Alpha = 0.29
B = -0.37 Beta = 1.041
C = 0.089 Gamma = 1.29

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [4] TIBAGI
River : Tibagi
Site : Uvaia
C.A. = 4,450 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	15.418	16.551	19.098	23.752	27.938	31.840	35.552	39.130
3	12.631	13.558	15.645	19.458	22.887	26.084	29.125	32.056
4	11.218	12.042	13.895	17.282	20.327	23.166	25.868	28.470
5	10.325	11.083	12.789	15.906	18.709	21.322	23.808	26.204
6	9.695	10.407	12.009	14.936	17.568	20.021	22.356	24.606
7	9.220	9.898	11.421	14.205	16.708	19.041	21.262	23.401
8	8.846	9.496	10.958	13.628	16.030	18.269	20.399	22.452
9	8.542	9.169	10.581	13.159	15.478	17.640	19.697	21.679
10	8.288	8.897	10.266	12.768	15.018	17.115	19.111	21.034
15	7.448	7.995	9.225	11.473	13.496	15.380	17.174	18.902
20	6.961	7.473	8.623	10.724	12.615	14.376	16.053	17.668
25	6.635	7.123	8.219	10.222	12.024	13.703	15.301	16.840
30	6.398	6.867	7.924	9.856	11.593	13.212	14.752	16.237
35	6.214	6.671	7.697	9.573	11.261	12.833	14.330	15.772
40	6.068	6.513	7.516	9.348	10.995	12.531	13.992	15.400
45	5.947	6.384	7.366	9.162	10.776	12.281	13.713	15.093
50	5.845	6.275	7.240	9.005	10.592	12.071	13.479	14.835
60	5.683	6.100	7.039	8.754	10.297	11.735	13.103	14.422
70	5.557	5.965	6.883	8.561	10.069	11.476	12.814	14.103
80	5.456	5.857	6.758	8.405	9.887	11.268	12.581	13.847
90	5.373	5.768	6.655	8.277	9.736	11.096	12.390	13.637
100	5.303	5.693	6.569	8.170	9.609	10.951	12.228	13.459

A = 1.53 Alpha = 0.25
B = -0.27 Beta = 1.092
C = 0.078 Gamma = 1.90

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [5] TIBAGI
River : Tibagi
Site : Tibagi
C.A. = 8,948 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	26.731	28.076	31.632	38.266	44.208	49.703	54.892	59.859
3	21.199	22.265	25.086	30.347	35.058	39.416	43.532	47.470
4	18.658	19.597	22.080	26.710	30.857	34.693	38.315	41.782
5	17.155	18.018	20.301	24.559	28.372	31.898	35.229	38.416
6	16.148	16.960	19.109	23.116	26.705	30.025	33.160	36.160
7	15.419	16.194	18.246	22.072	25.499	28.669	31.662	34.527
8	14.864	15.611	17.589	21.278	24.581	27.637	30.522	33.284
9	14.425	15.150	17.070	20.650	23.856	26.821	29.621	32.301
10	14.068	14.776	16.648	20.139	23.266	26.158	28.889	31.503
15	12.954	13.606	15.329	18.544	21.423	24.086	26.601	29.008
20	12.359	12.981	14.625	17.692	20.439	22.980	25.379	27.675
25	11.982	12.585	14.179	17.153	19.816	22.279	24.606	26.832
30	11.720	12.309	13.869	16.777	19.382	21.792	24.067	26.244
35	11.525	12.105	13.639	16.499	19.061	21.430	23.667	25.809
40	11.375	11.947	13.460	16.283	18.811	21.149	23.358	25.471
45	11.254	11.820	13.317	16.110	18.611	20.925	23.110	25.200
50	11.155	11.716	13.200	15.968	18.447	20.740	22.906	24.978
60	11.001	11.554	13.018	15.748	18.193	20.454	22.590	24.634
70	10.886	11.434	12.882	15.584	18.004	20.242	22.355	24.378
80	10.797	11.341	12.777	15.457	17.857	20.076	22.173	24.179
90	10.726	11.266	12.693	15.355	17.739	19.944	22.026	24.019
100	10.668	11.204	12.624	15.271	17.642	19.835	21.906	23.888

A = 1.48 Alpha = 0.33
B = -0.28 Beta = 1.061
C = 0.074 Gamma = 1.34

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [6] TIBAGI
River : Tibagi
Site : Barra Rib.Das Antas
C.A. = 15,600 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	44.177	52.244	67.378	95.754	123.022	149.949	176.856	203.904
3	35.288	41.731	53.821	76.487	98.268	119.776	141.269	162.874
4	31.270	36.980	47.692	67.778	87.079	106.138	125.184	144.329
5	28.918	34.198	44.105	62.679	80.528	98.154	115.767	133.472
6	27.353	32.348	41.719	59.288	76.172	92.844	109.504	126.251
7	26.229	31.018	40.004	56.851	73.040	89.027	105.002	121.061
8	25.377	30.011	38.705	55.005	70.668	86.136	101.592	117.130
9	24.707	29.218	37.683	53.553	68.803	83.862	98.910	114.037
10	24.165	28.577	36.856	52.377	67.292	82.021	96.739	111.534
15	22.486	26.591	34.295	48.738	62.617	76.322	90.018	103.785
20	21.600	25.544	32.944	46.819	60.151	73.317	86.473	99.698
25	21.045	24.888	32.098	45.616	58.606	71.433	84.251	97.136
30	20.661	24.434	31.512	44.783	57.537	70.130	82.714	95.364
35	20.378	24.099	31.081	44.170	56.748	69.169	81.581	94.058
40	20.160	23.841	30.748	43.697	56.140	68.428	80.707	93.050
45	19.986	23.635	30.482	43.320	55.656	67.838	80.010	92.247
50	19.844	23.467	30.265	43.011	55.259	67.354	79.441	91.590
60	19.624	23.207	29.930	42.535	54.648	66.609	78.561	90.576
70	19.462	23.015	29.682	42.183	54.195	66.058	77.911	89.826
80	19.336	22.867	29.491	41.911	53.846	65.632	77.409	89.247
90	19.236	22.748	29.338	41.694	53.567	65.292	77.008	88.785
100	19.154	22.651	29.213	41.516	53.339	65.013	76.679	88.406

A = 1.28 Alpha = 0.36
B = -0.25 Beta = 1.044
C = 0.101 Gamma = 1.28

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [7] TIBAGI
River : Tibagi
Site : Jataizinho(Extendido)
C.A. = 21,955 km2

TR (years)	Duration[days] 7	15	30	60	90	120	150	180
2	41.549	41.507	46.102	56.641	66.950	76.978	86.813	96.520
3	31.442	31.410	34.887	42.863	50.664	58.252	65.694	73.040
4	27.114	27.086	30.085	36.962	43.689	50.233	56.651	62.986
5	24.670	24.645	27.373	33.631	39.751	45.706	51.545	57.308
6	23.088	23.065	25.618	31.475	37.203	42.776	48.241	53.635
7	21.977	21.954	24.385	29.959	35.412	40.716	45.918	51.052
8	21.150	21.129	23.468	28.833	34.081	39.185	44.191	49.133
9	20.511	20.490	22.758	27.961	33.050	38.000	42.855	47.647
10	20.000	19.980	22.192	27.265	32.227	37.054	41.788	46.461
15	18.468	18.449	20.491	25.176	29.758	34.215	38.586	42.901
20	17.694	17.676	19.633	24.121	28.511	32.782	36.970	41.103
25	17.224	17.207	19.111	23.481	27.754	31.911	35.988	40.012
30	16.907	16.890	18.760	23.048	27.243	31.324	35.326	39.276
35	16.678	16.661	18.506	22.736	26.874	30.900	34.847	38.744
40	16.505	16.488	18.313	22.500	26.595	30.578	34.485	38.341
45	16.368	16.352	18.162	22.314	26.375	30.326	34.200	38.024
50	16.259	16.242	18.040	22.164	26.198	30.122	33.970	37.769
60	16.092	16.075	17.855	21.937	25.929	29.813	33.622	37.382
70	15.971	15.955	17.721	21.772	25.735	29.589	33.370	37.101
80	15.879	15.863	17.619	21.647	25.587	29.419	33.178	36.888
90	15.807	15.791	17.539	21.549	25.471	29.286	33.027	36.720
100	15.749	15.733	17.475	21.469	25.377	29.178	32.906	36.585

A = 1.39 Alpha = 0.30
B = -0.49 Beta = 1.026
C = 0.105 Gamma = 1.11

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [*C] TIBAGI
River : Tibagi
Site : Primeiro de Maio
C.A. = 24,712 km2

TR (years)	Duration[days] 7	15	30	60	90	120	150	180
2	67.505	66.401	70.695	81.047	90.856	100.051	108.770	117.120
3	53.109	52.240	55.619	63.763	71.480	78.714	85.574	92.143
4	46.357	45.599	48.548	55.657	62.393	68.708	74.695	80.430
5	42.306	41.614	44.305	50.793	56.940	62.703	68.167	73.400
6	39.560	38.913	41.429	47.496	53.244	58.633	63.743	68.636
7	37.556	36.942	39.331	45.090	50.547	55.663	60.514	65.159
8	36.019	35.430	37.721	43.245	48.478	53.384	58.037	62.492
9	34.796	34.227	36.440	41.777	46.832	51.572	56.067	60.371
10	33.797	33.244	35.394	40.577	45.487	50.091	54.456	58.637
15	30.636	30.135	32.084	36.783	41.234	45.407	49.364	53.154
20	28.919	28.446	30.286	34.721	38.923	42.862	46.598	50.175
25	27.819	27.364	29.134	33.400	37.442	41.232	44.825	48.266
30	27.045	26.603	28.323	32.471	36.401	40.085	43.578	46.923
35	26.467	26.034	27.717	31.776	35.622	39.227	42.645	45.919
40	26.015	25.589	27.244	31.234	35.014	38.557	41.918	45.135
45	25.651	25.231	26.863	30.797	34.524	38.018	41.331	44.504
50	25.351	24.936	26.549	30.436	34.120	37.573	40.847	43.983
60	24.882	24.474	26.057	29.873	33.488	36.878	40.091	43.169
70	24.530	24.129	25.689	29.451	33.015	36.356	39.525	42.559
80	24.255	23.858	25.401	29.121	32.645	35.949	39.082	42.082
90	24.033	23.640	25.169	28.854	32.346	35.620	38.724	41.697
100	23.850	23.460	24.977	28.634	32.100	35.348	38.429	41.379

A = 1.58 Alpha = 0.28
B = -0.38 Beta = 1.056
C = 0.077 Gamma = 1.43

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [8] PIRAPO
River : Pirapo
Site : Vila Silva Jardim
C.A. = 4,627 km2

TR (years)	Duration[days] 7	15	30	60	90	120	150	180
2	34.771	35.504	38.093	42.925	47.088	50.798	54.191	57.346
3	30.226	30.863	33.114	37.314	40.933	44.158	47.107	49.850
4	27.576	28.157	30.211	34.043	37.345	40.287	42.978	45.480
5	25.735	26.278	28.194	31.770	34.852	37.598	40.109	42.444
6	24.341	24.853	26.666	30.048	32.962	35.560	37.935	40.143
7	23.226	23.715	25.445	28.673	31.454	33.932	36.198	38.306
8	22.304	22.774	24.435	27.534	30.204	32.585	34.761	36.784
9	21.520	21.974	23.577	26.567	29.144	31.440	33.540	35.492
10	20.842	21.281	22.833	25.729	28.225	30.449	32.482	34.373
15	18.406	18.793	20.164	22.722	24.925	26.889	28.685	30.355
20	16.825	17.180	18.433	20.771	22.785	24.581	26.222	27.749
25	15.674	16.004	17.171	19.349	21.226	22.898	24.428	25.850
30	14.777	15.089	16.189	18.243	20.012	21.589	23.031	24.371
35	14.049	14.345	15.391	17.343	19.025	20.524	21.895	23.169
40	13.438	13.721	14.722	16.589	18.198	19.632	20.943	22.162
45	12.914	13.186	14.148	15.943	17.489	18.867	20.127	21.299
50	12.458	12.720	13.648	15.379	16.871	18.200	19.415	20.546
60	11.692	11.939	12.810	14.434	15.834	17.082	18.223	19.284
70	11.069	11.302	12.127	13.665	14.990	16.171	17.251	18.256
80	10.546	10.768	11.554	13.019	14.282	15.407	16.436	17.393
90	10.098	10.310	11.062	12.465	13.674	14.752	15.737	16.653
100	9.706	9.910	10.633	11.982	13.144	14.180	15.126	16.007

A = 2.22 Alpha = -0.22
B = -0.21 Beta = 1.112
C = 0.051 Gamma = 4.72

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [*D] PIRAPO
River : Pirapo
Site : Jardim Olinda
C.A. = 5,025 km2

TR (years)	Duration[days] 7	15	30	60	90	120	150	180
2	29.176	29.041	30.753	34.533	37.973	41.118	44.040	46.791
3	25.418	25.300	26.792	30.085	33.082	35.821	38.367	40.764
4	23.237	23.129	24.493	27.504	30.244	32.748	35.075	37.267
5	21.727	21.626	22.901	25.716	28.278	30.619	32.796	34.845
6	20.585	20.489	21.698	24.364	26.792	29.010	31.072	33.013
7	19.675	19.583	20.738	23.287	25.607	27.727	29.698	31.553
8	18.922	18.834	19.945	22.396	24.628	26.667	28.562	30.347
9	18.284	18.199	19.273	21.641	23.797	25.768	27.599	29.324
10	17.732	17.650	18.691	20.988	23.079	24.990	26.766	28.438
15	15.756	15.682	16.607	18.648	20.506	22.204	23.782	25.268
20	14.478	14.411	15.261	17.136	18.844	20.404	21.854	23.220
25	13.550	13.487	14.283	16.038	17.636	19.096	20.453	21.731
30	12.829	12.770	13.523	15.185	16.697	18.080	19.365	20.575
35	12.244	12.187	12.906	14.492	15.936	17.255	18.482	19.636
40	11.754	11.700	12.390	13.912	15.299	16.565	17.743	18.851
45	11.335	11.283	11.948	13.416	14.753	15.975	17.110	18.179
50	10.970	10.919	11.563	12.984	14.278	15.460	16.559	17.593
60	10.359	10.311	10.919	12.261	13.482	14.599	15.636	16.613
70	9.862	9.816	10.395	11.673	12.836	13.899	14.887	15.817
80	9.446	9.402	9.957	11.180	12.294	13.312	14.258	15.149
90	9.089	9.047	9.581	10.758	11.830	12.809	13.720	14.577
100	8.778	8.737	9.253	10.390	11.425	12.371	13.250	14.078

A = 2.07 Alpha = -0.15
B = -0.29 Beta = 1.122
C = 0.061 Gamma = 4.50

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : (9) IVAI
River : Ival
Site : Tereza Cristina
C.A. = 3,572 km2

TR (years)	Duration(days) 7	15	30	60	90	120	150	180
2	8.057	8.702	10.610	14.614	18.650	22.741	26.910	31.169
3	6.532	7.055	8.601	11.847	15.119	18.436	21.815	25.268
4	5.865	6.334	7.723	10.637	13.575	16.553	19.588	22.688
5	5.483	5.922	7.220	9.944	12.691	15.475	18.312	21.210
6	5.233	5.652	6.891	9.491	12.113	14.770	17.478	20.244
7	5.056	5.461	6.658	9.170	11.703	14.270	16.886	19.559
8	4.923	5.318	6.483	8.930	11.396	13.896	16.443	19.046
9	4.820	5.206	6.347	8.742	11.157	13.604	16.099	18.646
10	4.737	5.117	6.238	8.592	10.965	13.371	15.822	18.326
15	4.486	4.845	5.906	8.135	10.382	12.660	14.981	17.352
20	4.356	4.705	5.736	7.901	10.083	12.295	14.549	16.852
25	4.277	4.619	5.631	7.757	9.899	12.071	14.284	16.544
30	4.223	4.561	5.560	7.658	9.774	11.918	14.103	16.335
35	4.183	4.518	5.508	7.587	9.682	11.807	13.971	16.182
40	4.153	4.486	5.469	7.532	9.613	11.722	13.871	16.066
45	4.129	4.460	5.437	7.489	9.558	11.655	13.791	15.974
50	4.110	4.439	5.412	7.454	9.513	11.600	13.727	15.900
60	4.081	4.407	5.373	7.401	9.445	11.517	13.629	15.786
70	4.059	4.384	5.345	7.362	9.395	11.457	13.557	15.703
80	4.043	4.366	5.323	7.332	9.357	11.410	13.502	15.639
90	4.030	4.352	5.306	7.309	9.327	11.374	13.459	15.589
100	4.019	4.341	5.292	7.290	9.303	11.344	13.424	15.548

A = 1.43 Alpha = 0.42
B = -0.49 Beta = 1.030
C = 0.127 Gamma = 1.17

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [10] IVAI
River : Ival
Site : Porto Espanhol
C.A. = 8,600 km2

TR (years)	Duration(days) 7	15	30	60	90	120	150	180
2	14.465	14.915	17.733	24.213	30.977	37.968	45.196	52.669
3	11.506	11.864	14.106	19.260	24.641	30.202	35.951	41.896
4	10.161	10.477	12.457	17.010	21.761	26.672	31.750	36.999
5	9.371	9.663	11.489	15.687	20.069	24.598	29.281	34.123
6	8.844	9.119	10.843	14.805	18.941	23.215	27.634	32.204
7	8.465	8.728	10.377	14.170	18.128	22.219	26.448	30.822
8	8.177	8.431	10.024	13.687	17.511	21.463	25.549	29.773
9	7.950	8.197	9.746	13.308	17.025	20.867	24.839	28.947
10	7.766	8.007	9.520	13.000	16.631	20.384	24.265	28.277
15	7.194	7.418	8.820	12.043	15.407	18.885	22.479	26.197
20	6.892	7.106	8.449	11.537	14.759	18.090	21.534	25.095
25	6.702	6.910	8.216	11.218	14.352	17.591	20.939	24.402
30	6.570	6.774	8.054	10.997	14.069	17.244	20.527	23.921
35	6.472	6.673	7.934	10.834	13.860	16.988	20.222	23.566
40	6.397	6.596	7.842	10.708	13.699	16.791	19.987	23.292
45	6.337	6.534	7.768	10.607	13.570	16.633	19.799	23.073
50	6.287	6.483	7.708	10.525	13.465	16.504	19.645	22.894
60	6.211	6.404	7.615	10.397	13.302	16.304	19.407	22.616
70	6.155	6.346	7.546	10.303	13.181	16.156	19.231	22.411
80	6.111	6.301	7.492	10.230	13.087	16.041	19.095	22.252
90	6.076	6.265	7.449	10.171	13.013	15.949	18.986	22.125
100	6.048	6.236	7.414	10.123	12.951	15.874	18.896	22.021

A = 1.35 Alpha = 0.34
B = -0.63 Beta = 1.031
C = 0.144 Gamma = 1.30

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [11] IVAI
River : Ivai
Site : Porto Bananeiras
C.A. = 24,200 km2

TR (years)	Duration(days) 7	15	30	60	90	120	150	180
2	72.837	77.000	92.903	127.738	163.502	200.154	237.811	276.548
3	58.372	61.709	74.454	102.371	131.034	160.407	190.586	221.630
4	51.871	54.836	66.161	90.970	116.440	142.542	169.360	196.946
5	48.079	50.828	61.325	84.320	107.928	132.122	156.979	182.549
6	45.565	48.169	58.117	79.909	102.283	125.211	148.768	173.001
7	43.761	46.263	55.817	76.747	98.234	120.255	142.880	166.154
8	42.398	44.822	54.078	74.356	95.174	116.509	138.429	160.978
9	41.327	43.690	52.713	72.478	92.771	113.567	134.934	156.913
10	40.462	42.775	51.609	70.961	90.829	111.189	132.108	153.627
15	37.792	39.952	48.203	66.277	84.834	103.851	123.389	143.488
20	36.390	38.470	46.415	63.819	81.687	99.999	118.813	138.165
25	35.514	37.544	45.298	62.283	79.721	97.592	115.953	134.840
30	34.909	36.905	44.527	61.223	78.364	95.931	113.979	132.545
35	34.465	36.435	43.960	60.443	77.366	94.709	112.528	130.857
40	34.123	36.073	43.523	59.843	76.598	93.769	111.410	129.557
45	33.850	35.785	43.176	59.365	75.986	93.020	110.521	128.523
50	33.628	35.550	42.892	58.975	75.487	92.409	109.794	127.678
60	33.285	35.188	42.455	58.374	74.717	91.467	108.675	126.377
70	33.032	34.920	42.132	57.930	74.150	90.772	107.850	125.417
80	32.837	34.714	41.883	57.588	73.712	90.236	107.213	124.676
90	32.682	34.550	41.685	57.315	73.363	89.809	106.705	124.086
100	32.554	34.415	41.523	57.093	73.078	89.459	106.290	123.603

A = 1.82 Alpha = 0.37
B = -0.56 Beta = 1.034
C = 0.136 Gamma = 1.26

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [12] IVAI
River : Ivai
Site : Porto Paraiso do Norte
C.A. = 28,427 km2

TR (years)	Duration(days) 7	15	30	60	90	120	150	180
2	222.826	225.587	237.521	259.886	278.857	295.498	310.500	324.279
3	194.328	196.736	207.144	226.648	243.193	257.706	270.789	282.806
4	179.161	181.381	190.976	208.958	224.212	237.592	249.654	260.733
5	169.251	171.348	180.412	197.400	211.809	224.450	235.845	246.310
6	162.085	164.093	172.774	189.042	202.841	214.947	225.859	235.882
7	156.574	158.514	166.899	182.614	195.945	207.638	218.180	227.861
8	152.155	154.041	162.189	177.461	190.415	201.779	212.023	221.431
9	148.504	150.344	158.298	173.203	185.846	196.937	206.935	216.118
10	145.418	147.220	155.008	169.603	181.984	192.845	202.635	211.627
15	134.918	136.590	143.816	157.357	168.844	178.920	188.003	196.346
20	128.594	130.188	137.075	149.981	160.930	170.534	179.191	187.143
25	124.229	125.768	132.421	144.890	155.467	164.745	173.108	180.790
30	120.971	122.470	128.949	141.091	151.390	160.425	168.569	176.050
35	118.415	119.882	126.224	138.109	148.190	157.034	165.007	172.329
40	116.335	117.777	124.007	135.683	145.588	154.277	162.109	169.302
45	114.598	116.018	122.156	133.658	143.415	151.973	159.689	166.775
50	113.118	114.520	120.578	131.932	141.562	150.010	157.626	164.621
60	110.710	112.082	118.011	129.123	138.549	146.817	154.271	161.117
70	108.816	110.165	115.992	126.914	136.179	144.306	151.632	158.360
80	107.273	108.603	114.348	125.115	134.248	142.259	149.482	156.115
90	105.983	107.297	112.973	123.610	132.633	140.549	147.684	154.238
100	104.883	106.183	111.800	122.327	131.256	139.089	146.151	152.636

A = 2.27 Alpha = 0.35
B = -0.17 Beta = 1.071
C = 0.040 Gamma = 2.40

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : (13) IVAI
River : Ivai
Site : Novo Porto Taquara
C.A. = 34,432 km2

TR (years)	Duration(days) 7	15	30	60	90	120	150	180
2	212.073	216.052	236.767	278.589	316.667	351.955	385.249	417.053
3	189.388	192.941	211.440	248.788	282.793	314.307	344.039	372.441
4	176.502	179.814	197.054	231.861	263.552	292.922	320.632	347.101
5	167.705	170.851	187.232	220.304	250.416	278.322	304.650	329.800
6	161.126	164.150	179.888	211.663	240.593	267.405	292.700	316.864
7	155.928	158.854	174.085	204.835	232.832	258.778	283.258	306.641
8	151.665	154.511	169.325	199.234	226.465	251.702	275.512	298.257
9	148.072	150.850	165.313	194.514	221.100	245.739	268.985	291.191
10	144.981	147.702	161.863	190.454	216.485	240.610	263.371	285.113
15	134.054	136.569	149.663	176.099	200.169	222.475	243.521	263.624
20	127.114	129.499	141.915	166.983	189.806	210.958	230.914	249.977
25	122.135	124.427	136.357	160.442	182.372	202.695	221.869	240.185
30	118.305	120.525	132.081	155.411	176.653	196.339	214.912	232.654
35	115.223	117.385	128.639	151.362	172.050	191.223	209.312	226.592
40	112.661	114.776	125.780	147.997	168.226	186.972	204.660	221.555
45	110.482	112.555	123.347	145.134	164.972	183.356	200.701	217.269
50	108.594	110.631	121.238	142.654	162.152	180.222	197.270	213.555
60	105.456	107.435	117.735	138.532	157.466	175.014	191.570	207.385
70	102.926	104.857	114.910	135.208	153.688	170.815	186.974	202.409
80	100.820	102.712	112.560	132.442	150.544	167.321	183.149	198.268
90	99.027	100.885	110.558	130.086	147.867	164.345	179.892	194.742
100	97.472	99.301	108.821	128.043	145.545	161.764	177.066	191.684

A = 2.10 Alpha = 0.22
B = -0.32 Beta = 1.150
C = 0.074 Gamma = 3.70

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [*E] IVAI
River : Ivai
Site : Pontal do Tigre
C.A. = 36,594 km2

TR (years)	Duration(days) 7	15	30	60	90	120	150	180
2	204.734	208.027	229.731	275.027	317.207	356.931	394.902	431.577
3	181.429	184.347	203.581	243.720	281.099	316.302	349.950	382.450
4	168.192	170.897	188.727	225.938	260.590	293.224	324.417	354.546
5	159.154	161.714	178.586	213.797	246.587	277.467	306.984	335.495
6	152.396	154.847	171.003	204.719	236.117	265.686	293.950	321.249
7	147.056	149.421	165.011	197.546	227.843	256.376	283.650	309.993
8	142.676	144.971	160.096	191.662	221.057	248.740	275.201	300.759
9	138.985	141.220	155.954	186.703	215.338	242.305	268.081	292.978
10	135.810	137.994	152.392	182.438	210.419	236.769	261.957	286.285
15	124.584	126.588	139.795	167.359	193.026	217.199	240.305	262.622
20	117.455	119.344	131.796	157.782	181.980	204.770	226.553	247.594
25	112.340	114.147	126.056	150.910	174.055	195.852	216.687	236.811
30	108.406	110.149	121.641	145.625	167.959	188.993	209.098	228.518
35	105.239	106.931	118.088	141.371	163.053	183.472	202.990	221.842
40	102.608	104.258	115.136	137.837	158.976	178.885	197.915	216.295
45	100.369	101.983	112.623	134.829	155.508	174.982	193.596	211.576
50	98.429	100.012	110.446	132.223	152.502	171.600	189.854	207.487
60	95.205	96.736	106.829	127.893	147.507	165.980	183.637	200.691
70	92.606	94.095	103.913	124.401	143.480	161.448	178.623	195.212
80	90.443	91.898	101.486	121.495	140.129	157.677	174.451	190.653
90	88.601	90.026	99.419	119.021	137.275	154.466	170.898	186.769
100	87.003	88.402	97.626	116.874	134.799	151.680	167.816	183.401

A = 2.10 Alpha = 0.16
B = -0.37 Beta = 1.114
C = 0.084 Gamma = 3.70

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [14] PIQUIRI
River : Piquiri
Site : Porto Guarani
C.A. = 4,223 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	20.144	19.707	21.629	26.435	31.248	35.981	40.655	45.295
3	16.389	16.034	17.597	21.508	25.424	29.274	33.077	36.853
4	14.511	14.197	15.581	19.043	22.510	25.920	29.287	32.630
5	13.334	13.045	14.317	17.499	20.685	23.817	26.912	29.983
6	12.510	12.239	13.432	16.417	19.406	22.345	25.248	28.129
7	11.892	11.634	12.769	15.606	18.447	21.241	24.001	26.740
8	11.407	11.160	12.248	14.970	17.695	20.375	23.022	25.650
9	11.014	10.775	11.826	14.454	17.086	19.673	22.229	24.766
10	10.687	10.455	11.475	14.025	16.578	19.089	21.569	24.031
15	9.614	9.406	10.323	12.617	14.915	17.173	19.404	21.619
20	9.000	8.805	9.664	11.811	13.962	16.076	18.165	20.238
25	8.592	8.405	9.225	11.275	13.328	15.346	17.340	19.319
30	8.295	8.115	8.907	10.886	12.868	14.817	16.742	18.653
35	8.068	7.893	8.663	10.588	12.516	14.411	16.283	18.142
40	7.887	7.716	8.469	10.350	12.235	14.088	15.918	17.735
45	7.739	7.571	8.309	10.156	12.005	13.823	15.618	17.401
50	7.614	7.449	8.175	9.992	11.811	13.600	15.367	17.121
60	7.415	7.255	7.962	9.731	11.503	13.245	14.966	16.674
70	7.263	7.105	7.798	9.531	11.266	12.973	14.658	16.331
80	7.141	6.986	7.667	9.371	11.077	12.755	14.412	16.057
90	7.041	6.888	7.560	9.240	10.922	12.576	14.210	15.832
100	6.957	6.806	7.470	9.129	10.792	12.426	14.040	15.643

A = 2.27 Alpha = 0.26
B = -0.55 Beta = 1.094
C = 0.112 Gamma = 1.80

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [15] PIQUIRI
River : Piquiri
Site : Ponte do Piquiri
C.A. = 11,303 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	108.309	114.749	129.785	157.005	181.062	203.150	223.901	243.678
3	88.866	94.149	106.486	128.820	148.558	166.680	183.706	199.933
4	79.540	84.269	95.312	115.302	132.968	149.189	164.429	178.952
5	73.859	78.250	88.504	107.066	123.471	138.533	152.684	166.171
6	69.964	74.124	83.837	101.420	116.960	131.228	144.633	157.408
7	67.096	71.085	80.399	97.262	112.164	125.847	138.702	150.954
8	64.878	68.735	77.742	94.047	108.456	121.687	134.117	145.964
9	63.102	66.853	75.613	91.472	105.487	118.356	130.446	141.968
10	61.641	65.306	73.863	89.355	103.046	115.616	127.426	138.682
15	56.964	60.350	68.259	82.575	95.227	106.843	117.757	128.159
20	54.375	57.608	65.157	78.823	90.900	101.989	112.407	122.335
25	52.695	55.828	63.144	76.387	88.091	98.837	108.933	118.555
30	51.501	54.562	61.712	74.655	86.094	96.597	106.464	115.867
35	50.600	53.608	60.633	73.349	84.588	94.907	104.601	113.840
40	49.891	52.858	59.784	72.323	83.404	93.578	103.137	112.247
45	49.317	52.249	59.096	71.490	82.444	92.501	101.950	110.955
50	48.840	51.744	58.525	70.799	81.647	91.607	100.965	109.883
60	48.091	50.950	57.626	69.712	80.393	90.201	99.414	108.196
70	47.524	50.349	56.947	68.890	79.446	89.137	98.242	106.920
80	47.077	49.876	56.412	68.243	78.699	88.300	97.319	105.915
90	46.715	49.492	55.977	67.718	78.093	87.620	96.570	105.100
100	46.413	49.173	55.616	67.281	77.590	87.055	95.947	104.422

A = 2.56 Alpha = 0.36
B = -0.25 Beta = 1.076
C = 0.070 Gamma = 1.54

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [16] PIQUIRI
River : Piquiri
Site : Porto Formosa
C.A. = 17,500 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	158.791	172.486	197.966	241.157	278.248	311.806	343.014	372.521
3	134.735	146.355	167.975	204.623	236.095	264.569	291.049	316.086
4	122.914	133.514	153.237	186.670	215.380	241.356	265.513	288.354
5	115.594	125.563	144.111	175.553	202.554	226.983	249.701	271.181
6	110.513	120.044	137.777	167.837	193.650	217.005	238.725	259.261
7	106.732	115.938	133.064	162.096	187.026	209.583	230.559	250.393
8	103.785	112.736	129.390	157.619	181.862	203.795	224.192	243.478
9	101.408	110.153	126.426	154.009	177.696	199.126	219.057	237.901
10	99.440	108.016	123.972	151.020	174.248	195.263	214.806	233.285
15	93.050	101.075	116.006	141.315	163.050	182.714	201.002	218.293
20	89.443	97.157	111.509	135.838	156.730	175.632	193.211	209.832
25	87.068	94.577	108.548	132.231	152.568	170.969	188.081	204.260
30	85.360	92.722	106.419	129.637	149.576	167.615	184.392	200.253
35	84.060	91.310	104.798	127.663	147.298	165.063	181.583	197.204
40	83.030	90.191	103.514	126.099	145.493	163.040	179.358	194.787
45	82.189	89.278	102.466	124.822	144.019	161.389	177.542	192.815
50	81.487	88.515	101.590	123.755	142.789	160.010	176.025	191.167
60	80.373	87.305	100.202	122.064	140.837	157.823	173.619	188.555
70	79.524	86.382	99.143	120.773	139.349	156.155	171.784	186.561
80	78.849	85.650	98.302	119.749	138.167	154.830	170.327	184.979
90	78.298	85.051	97.615	118.912	137.201	153.748	169.136	183.686
100	77.837	84.550	97.040	118.212	136.393	152.843	168.140	182.604

A = 2.38 Alpha = 0.42
B = -0.18 Beta = 1.070
C = 0.062 Gamma = 1.68

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [17] PIQUIRI
River : Piquiri
Site : Balsa do Santa Maria
C.A. = 20,982 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	145.445	157.158	183.169	230.986	274.395	315.167	354.216	392.056
3	125.832	135.965	158.468	199.837	237.392	272.666	306.449	339.186
4	115.426	124.721	145.363	183.311	217.760	250.118	281.107	311.137
5	108.641	117.390	136.819	172.536	204.960	235.416	264.583	292.848
6	103.743	112.097	130.650	164.757	195.719	224.802	252.654	279.644
7	99.981	108.032	125.912	158.783	188.622	216.650	243.492	269.504
8	96.968	104.777	122.118	153.998	182.938	210.121	236.155	261.383
9	94.481	102.089	118.986	150.048	178.246	204.732	230.098	254.679
10	92.380	99.820	116.340	146.712	174.283	200.180	224.982	249.016
15	85.246	92.111	107.356	135.383	160.825	184.722	207.609	229.787
20	80.961	87.481	101.960	128.577	152.740	175.436	197.172	218.235
25	78.008	84.290	98.241	123.888	147.169	169.037	189.981	210.276
30	75.808	81.913	95.470	120.394	143.019	164.270	184.623	204.345
35	74.083	80.049	93.298	117.654	139.765	160.532	180.422	199.696
40	72.682	78.585	91.533	115.429	137.121	157.496	177.009	195.919
45	71.513	77.272	90.061	113.572	134.915	154.962	174.162	192.767
50	70.517	76.196	88.807	111.990	133.036	152.804	171.737	190.083
60	68.899	74.447	86.769	109.420	129.983	149.297	167.795	185.720
70	67.627	73.073	85.168	107.401	127.585	146.543	164.699	182.293
80	66.593	71.955	83.865	105.758	125.633	144.301	162.179	179.504
90	65.728	71.022	82.776	104.386	124.002	142.428	160.075	177.175
100	64.992	70.226	81.848	103.215	122.612	140.831	158.280	175.189

A = 2.19 Alpha = 0.33
B = -0.28 Beta = 1.090
C = 0.082 Gamma = 2.36

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [4P] PIQUIRI
River : Piquiri
Site : Porto Sinod
C.A. = 24,731 km2

TR (years)	Duration(days) 7	15	30	60	90	120	150	180
2	139.828	145.726	165.517	204.781	241.315	275.980	309.385	341.900
3	121.087	126.194	143.332	177.334	208.971	238.990	267.917	296.075
4	110.844	115.519	131.208	162.333	191.295	218.774	245.255	271.031
5	104.031	108.419	123.143	152.355	179.537	205.327	230.180	254.372
6	99.037	103.214	117.232	145.041	170.918	195.470	219.130	242.160
7	95.154	99.167	112.635	139.354	164.216	187.806	210.538	232.665
8	92.011	95.892	108.915	134.752	158.793	181.604	203.585	224.981
9	89.394	93.164	105.817	130.919	154.276	176.438	197.794	218.581
10	87.166	90.842	103.179	127.656	150.430	172.040	192.863	213.133
15	79.465	82.817	94.064	116.378	137.141	156.841	175.825	194.304
20	74.726	77.878	88.455	109.438	128.963	147.488	165.340	182.717
25	71.403	74.415	84.521	104.571	123.228	140.929	157.987	174.592
30	68.893	71.798	81.550	100.895	118.895	135.974	152.433	168.453
35	66.902	69.724	79.193	97.979	115.460	132.045	148.028	163.585
40	65.269	68.022	77.260	95.587	112.641	128.822	144.414	159.592
45	63.895	66.589	75.633	93.575	110.269	126.109	141.373	156.231
50	62.715	65.360	74.237	91.847	108.234	123.781	138.764	153.348
60	60.780	63.344	71.946	89.014	104.894	119.962	134.482	148.616
70	59.243	61.741	70.126	86.762	102.241	116.928	131.081	144.857
80	57.979	60.425	68.631	84.912	100.061	114.434	128.285	141.768
90	56.915	59.316	67.371	83.353	98.224	112.334	125.931	139.166
100	56.001	58.363	66.289	82.014	96.647	110.530	123.908	136.931

A = 2.10 Alpha = 0.23
B = -0.36 Beta = 1.103
C = 0.089 Gamma = 2.80

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [18] IGUACU
River : Iguacu
Site : Fazendinha
C.A. = 110 km2

TR (years)	Duration(days) 7	15	30	60	90	120	150	180
2	0.899	1.084	1.323	1.660	1.920	2.141	2.338	2.518
3	0.771	0.930	1.134	1.423	1.647	1.837	2.005	2.159
4	0.709	0.855	1.043	1.309	1.514	1.689	1.844	1.986
5	0.671	0.809	0.987	1.239	1.433	1.598	1.745	1.879
6	0.645	0.777	0.949	1.190	1.377	1.536	1.677	1.806
7	0.626	0.754	0.920	1.154	1.335	1.489	1.626	1.751
8	0.611	0.736	0.898	1.127	1.303	1.454	1.587	1.709
9	0.598	0.721	0.880	1.104	1.277	1.425	1.556	1.675
10	0.588	0.709	0.865	1.086	1.256	1.401	1.530	1.647
15	0.556	0.670	0.818	1.026	1.187	1.324	1.446	1.557
20	0.538	0.649	0.792	0.993	1.149	1.282	1.399	1.507
25	0.527	0.635	0.774	0.972	1.124	1.254	1.369	1.474
30	0.518	0.625	0.762	0.956	1.106	1.234	1.347	1.451
35	0.512	0.617	0.753	0.944	1.093	1.219	1.331	1.433
40	0.507	0.611	0.745	0.935	1.082	1.207	1.318	1.419
45	0.503	0.606	0.739	0.928	1.073	1.197	1.307	1.407
50	0.499	0.602	0.734	0.921	1.066	1.189	1.298	1.398
60	0.494	0.595	0.727	0.912	1.054	1.176	1.284	1.383
70	0.490	0.590	0.721	0.904	1.046	1.166	1.274	1.371
80	0.487	0.587	0.716	0.898	1.039	1.159	1.265	1.362
90	0.484	0.583	0.712	0.893	1.033	1.153	1.258	1.355
100	0.482	0.581	0.709	0.889	1.029	1.147	1.253	1.349

A = 1.84 Alpha = 0.47
B = 0.11 Beta = 1.060
C = 0.029 Gamma = 1.60

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [19] IGUACU
River : Iguacu
Site : Guajuvira
C.A. = 2,304 km2

TR (years)	Duration(days) 7	15	30	60	90	120	150	180
2	9.412	10.926	13.430	17.656	21.376	24.826	28.105	31.264
3	7.988	9.273	11.398	14.985	18.143	21.071	23.853	26.535
4	7.217	8.378	10.298	13.539	16.391	19.037	21.551	23.973
5	6.707	7.787	9.571	12.582	15.234	17.692	20.029	22.280
6	6.335	7.355	9.040	11.884	14.389	16.711	18.918	21.044
7	6.047	7.020	8.629	11.344	13.734	15.951	18.057	20.087
8	5.815	6.750	8.297	10.908	13.206	15.338	17.363	19.315
9	5.622	6.526	8.022	10.546	12.768	14.829	16.787	18.674
10	5.458	6.336	7.788	10.238	12.395	14.396	16.297	18.129
15	4.894	5.681	6.983	9.181	11.115	12.909	14.614	16.257
20	4.550	5.282	6.492	8.535	10.333	12.001	13.586	15.113
25	4.309	5.003	6.149	8.084	9.787	11.367	12.868	14.315
30	4.129	4.793	5.891	7.745	9.377	10.891	12.329	13.715
35	3.986	4.627	5.688	7.477	9.053	10.514	11.902	13.240
40	3.869	4.492	5.521	7.258	8.787	10.206	11.554	12.852
45	3.771	4.378	5.381	7.074	8.565	9.947	11.261	12.527
50	3.687	4.280	5.261	6.917	8.374	9.726	11.010	12.248
60	3.550	4.121	5.065	6.659	8.062	9.364	10.600	11.792
70	3.441	3.995	4.910	6.455	7.815	9.077	10.275	11.430
80	3.352	3.891	4.783	6.288	7.613	8.842	10.009	11.134
90	3.277	3.804	4.676	6.148	7.443	8.644	9.786	10.886
100	3.213	3.730	4.585	6.027	7.297	8.475	9.594	10.673

A = 1.42 Alpha = 0.17
B = -0.13 Beta = 1.095
C = 0.070 Gamma = 2.65

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [20] IGUACU
River : Iguacu
Site : Porto Amazonas
C.A. = 3,662 km2

TR (years)	Duration(days) 7	15	30	60	90	120	150	180
2	12.956	14.561	17.254	21.722	25.562	29.054	32.319	35.422
3	10.607	11.921	14.127	17.785	20.928	23.787	26.460	29.001
4	9.479	10.653	12.624	15.892	18.702	21.256	23.645	25.915
5	8.790	9.879	11.707	14.738	17.343	19.713	21.928	24.033
6	8.318	9.348	11.078	13.946	16.411	18.653	20.749	22.742
7	7.970	8.957	10.614	13.362	15.724	17.872	19.881	21.790
8	7.700	8.654	10.255	12.911	15.193	17.268	19.209	21.053
9	7.485	8.411	9.968	12.549	14.767	16.784	18.670	20.463
10	7.307	8.212	9.731	12.251	14.416	16.386	18.227	19.977
15	6.738	7.572	8.973	11.296	13.293	15.109	16.807	18.421
20	6.422	7.217	8.553	10.767	12.671	14.401	16.020	17.558
25	6.217	6.987	8.280	10.424	12.266	13.942	15.508	16.997
30	6.071	6.823	8.085	10.179	11.978	13.614	15.144	16.598
35	5.961	6.699	7.939	9.994	11.761	13.367	14.870	16.297
40	5.874	6.602	7.823	9.849	11.590	13.173	14.654	16.060
45	5.804	6.523	7.730	9.731	11.451	13.016	14.478	15.868
50	5.746	6.457	7.652	9.633	11.336	12.885	14.333	15.709
60	5.654	6.354	7.529	9.479	11.155	12.679	14.103	15.458
70	5.584	6.276	7.437	9.363	11.018	12.523	13.930	15.267
80	5.530	6.214	7.364	9.271	10.910	12.400	13.793	15.118
90	5.485	6.164	7.305	9.196	10.822	12.300	13.682	14.996
100	5.448	6.123	7.255	9.134	10.749	12.217	13.590	14.895

A = 1.38 Alpha = 0.35
B = -0.14 Beta = 1.073
C = 0.063 Gamma = 1.55

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [21] IGUACU
River : Iguacu
Site : Sao Mateus do Sul
C.A. = 6,065 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	17.389	19.458	23.695	31.584	38.963	46.078	53.045	59.928
3	13.218	14.791	18.012	24.008	29.618	35.026	40.322	45.554
4	11.175	12.505	15.228	20.298	25.040	29.612	34.090	38.513
5	9.913	11.092	13.508	18.005	22.211	26.267	30.239	34.163
6	9.038	10.113	12.316	16.416	20.251	23.949	27.571	31.148
7	8.388	9.386	11.430	15.235	18.795	22.227	25.588	28.908
8	7.882	8.820	10.740	14.316	17.661	20.886	24.044	27.163
9	7.474	8.363	10.185	13.575	16.747	19.805	22.799	25.758
10	7.137	7.986	9.725	12.962	15.991	18.911	21.770	24.595
15	6.043	6.762	8.235	10.976	13.541	16.013	18.435	20.827
20	5.428	6.073	7.396	9.858	12.162	14.382	16.557	18.705
25	5.023	5.621	6.845	9.123	11.255	13.310	15.323	17.311
30	4.733	5.296	6.449	8.596	10.604	12.540	14.437	16.310
35	4.512	5.048	6.148	8.195	10.109	11.955	13.763	15.549
40	4.337	4.853	5.910	7.877	9.718	11.492	13.230	14.946
45	4.194	4.693	5.715	7.618	9.398	11.114	12.795	14.455
50	4.075	4.560	5.553	7.402	9.131	10.799	12.432	14.045
60	3.887	4.349	5.297	7.060	8.709	10.300	11.857	13.395
70	3.743	4.189	5.101	6.799	8.387	9.919	11.419	12.900
80	3.629	4.061	4.946	6.592	8.132	9.617	11.071	12.508
90	3.536	3.957	4.819	6.423	7.924	9.371	10.788	12.188
100	3.459	3.870	4.713	6.282	7.750	9.165	10.551	11.920

A = 1.35 Alpha = 0.12
B = -0.29 Beta = 1.112
C = 0.094 Gamma = 1.66

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [22] IGUACU
River : Iguacu
Site : Uniao da Vitoria
C.A. = 24,211 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	164.542	182.963	214.073	265.339	308.994	348.401	385.020	419.637
3	128.315	142.680	166.941	206.919	240.963	271.693	300.251	327.246
4	111.808	124.325	145.465	180.301	209.964	236.742	261.625	285.148
5	102.092	113.521	132.824	164.632	191.718	216.169	238.890	260.368
6	95.603	106.306	124.382	154.168	179.533	202.429	223.706	243.819
7	90.923	101.102	118.294	146.622	170.745	192.521	212.756	231.885
8	87.369	97.150	113.670	140.891	164.071	184.995	204.440	222.821
9	84.567	94.034	110.023	136.372	158.808	179.061	197.882	215.674
10	82.293	91.506	107.065	132.705	154.538	174.247	192.562	209.875
15	75.222	83.644	97.866	121.303	141.260	159.276	176.017	191.842
20	71.469	79.471	92.983	115.251	134.212	151.329	167.235	182.271
25	69.105	76.842	89.908	111.439	129.773	146.323	161.703	176.242
30	67.464	75.017	87.772	108.792	126.691	142.848	157.863	172.056
35	66.250	73.667	86.193	106.834	124.411	140.278	155.022	168.960
40	65.312	72.623	84.972	105.321	122.649	138.291	152.826	166.567
45	64.562	71.790	83.997	104.112	121.241	136.703	151.072	164.654
50	63.947	71.106	83.197	103.121	120.087	135.402	149.633	163.087
60	62.996	70.049	81.960	101.587	118.301	133.388	147.408	160.662
70	62.291	69.265	81.042	100.450	116.976	131.895	145.758	158.863
80	61.745	68.657	80.332	99.569	115.951	130.738	144.480	157.470
90	61.308	68.171	79.763	98.864	115.130	129.813	143.457	156.355
100	60.949	67.772	79.296	98.286	114.456	129.053	142.618	155.441

A = 2.10 Alpha = 0.30
B = -0.14 Beta = 1.055
C = 0.060 Gamma = 1.31

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [23] IGUACU
River : Iguacu
Site : Salto Osorio
C.A. = 45,824 km2

TR (years)	Duration(days) 7	15	30	60	90	120	150	180
2	203.531	226.046	269.306	346.149	415.257	480.008	541.966	601.987
3	160.161	177.878	211.920	272.389	326.771	377.724	426.480	473.711
4	139.400	154.820	184.449	237.080	284.412	328.760	371.196	412.305
5	126.768	140.791	167.735	215.596	258.640	298.969	337.560	374.943
6	118.116	131.182	156.288	200.882	240.988	278.565	314.522	349.355
7	111.749	124.111	147.863	190.053	227.997	263.549	297.567	330.522
8	106.829	118.647	141.353	181.686	217.960	251.946	284.467	315.971
9	102.892	114.274	136.143	174.990	209.927	242.661	273.983	304.326
10	99.656	110.680	131.862	169.487	203.325	235.029	265.366	294.754
15	89.304	99.183	118.164	151.881	182.203	210.614	237.800	264.136
20	83.584	92.830	110.596	142.153	170.534	197.125	222.570	247.219
25	79.875	88.711	105.688	135.845	162.967	188.378	212.694	236.249
30	77.241	85.785	102.202	131.365	157.591	182.165	205.678	228.456
35	75.255	83.580	99.575	127.988	153.540	177.482	200.391	222.584
40	73.695	81.848	97.511	125.335	150.358	173.803	196.237	217.970
45	72.431	80.444	95.839	123.185	147.779	170.822	192.872	214.231
50	71.383	79.279	94.451	121.401	145.639	168.348	190.079	211.129
60	69.734	77.448	92.269	118.597	142.275	164.460	185.688	206.252
70	68.488	76.064	90.621	116.478	139.733	161.522	182.371	202.568
80	67.507	74.975	89.324	114.811	137.733	159.209	179.760	199.668
90	66.712	74.092	88.271	113.458	136.110	157.333	177.642	197.315
100	66.051	73.358	87.397	112.334	134.761	155.775	175.882	195.360

A = 1.75 Alpha = 0.25
B = -0.23 Beta = 1.070
C = 0.079 Gamma = 1.53

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [24] IGUACU
River : Iguacu
Site : Salto Cataratas
C.A. = 67,317 km2

TR (years)	Duration(days) 7	15	30	60	90	120	150	180
2	361.371	377.840	444.100	585.776	726.589	867.083	%1008.210	%1150.570
3	291.434	304.716	358.152	472.409	585.970	699.274	813.087	927.893
4	256.749	268.450	315.527	416.186	516.231	616.051	716.318	817.461
5	235.138	245.854	288.969	381.155	472.780	564.197	656.025	748.654
6	220.067	230.096	270.447	356.725	442.477	528.035	613.977	700.669
7	208.811	218.328	256.615	338.480	419.845	501.027	582.574	664.832
8	200.007	209.122	245.795	324.208	402.143	479.902	558.010	636.800
9	192.885	201.676	237.043	312.664	387.824	462.815	538.142	614.126
10	186.977	195.498	229.782	303.087	375.945	448.638	521.658	595.315
15	167.687	175.329	206.075	271.817	337.158	402.352	467.838	533.896
20	156.717	163.860	192.595	254.036	315.103	376.032	437.235	498.971
25	149.455	156.266	183.670	242.264	300.500	358.606	416.972	475.847
30	144.210	150.783	177.225	233.762	289.956	346.022	402.340	459.150
35	140.204	146.594	172.301	227.268	281.901	336.409	391.163	446.394
40	137.020	143.265	168.388	222.107	275.499	328.770	382.280	436.257
45	134.414	140.540	165.186	217.883	270.259	322.517	375.009	427.960
50	132.232	138.259	162.504	214.346	265.872	317.282	368.922	421.013
60	128.763	134.631	158.241	208.723	258.897	308.957	359.243	409.967
70	126.106	131.854	154.976	204.417	253.555	302.583	351.831	401.509
80	123.992	129.642	152.377	200.988	249.303	297.509	345.931	394.775
90	122.258	127.830	150.247	198.179	245.818	293.350	341.095	389.257
100	120.806	126.311	148.462	195.824	242.898	289.865	337.042	384.632

A = 2.20 Alpha = 0.27
B = -0.50 Beta = 1.170
C = 0.120 Gamma = 1.74

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [25] IGUACU
River : Negro
Site : Divisa
C.A. = 7,970 km2

TR	Duration[days]							
[years]	7	15	30	60	90	120	150	180
2	29.385	32.562	39.623	53.180	66.105	78.725	91.204	103.634
3	21.232	23.527	28.629	38.424	47.764	56.882	65.899	74.880
4	17.321	19.194	23.356	31.348	38.967	46.406	53.762	61.089
5	14.939	16.554	20.144	27.036	33.608	40.023	46.368	52.687
6	13.306	14.745	17.942	24.081	29.934	35.648	41.299	46.927
7	12.103	13.412	16.320	21.904	27.227	32.425	37.565	42.685
8	11.173	12.381	15.066	20.220	25.135	29.933	34.678	39.405
9	10.428	11.556	14.061	18.873	23.460	27.938	32.367	36.778
10	9.816	10.877	13.236	17.764	22.082	26.297	30.466	34.618
15	7.854	8.704	10.591	14.215	17.670	21.043	24.379	27.701
20	6.769	7.501	9.128	12.251	15.228	18.135	21.010	23.873
25	6.065	6.720	8.178	10.975	13.643	16.248	18.823	21.389
30	5.564	6.165	7.502	10.069	12.516	14.906	17.268	19.622
35	5.186	5.747	6.993	9.385	11.666	13.893	16.096	18.289
40	4.889	5.417	6.592	8.848	10.998	13.098	15.174	17.242
45	4.648	5.151	6.268	8.412	10.457	12.453	14.427	16.393
50	4.448	4.929	5.998	8.050	10.007	11.917	13.806	15.688
60	4.134	4.581	5.574	7.481	9.299	11.075	12.830	14.579
70	3.896	4.317	5.253	7.051	8.765	10.438	12.092	13.741
80	3.709	4.110	5.001	6.712	8.343	9.936	11.511	13.080
90	3.557	3.941	4.796	6.437	8.002	9.529	11.040	12.544
100	3.430	3.801	4.626	6.208	7.717	9.191	10.648	12.099

A = 1.70 Alpha = 0.05
B = -0.34 Beta = 1.112
C = 0.102 Gamma = 1.54

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [26] IGUACU
River : Timbo
Site : Foz do Cachdeira
C.A. = 693 km2

TR	Duration[days]							
[years]	7	15	30	60	90	120	150	180
2	2.840	3.246	4.054	5.575	7.023	8.440	9.844	11.246
3	1.823	2.083	2.602	3.579	4.508	5.417	6.319	7.219
4	1.381	1.579	1.972	2.712	3.416	4.105	4.788	5.470
5	1.129	1.291	1.612	2.217	2.793	3.356	3.915	4.473
6	0.965	1.103	1.378	1.895	2.387	2.869	3.346	3.823
7	0.849	0.971	1.212	1.667	2.100	2.524	2.944	3.363
8	0.763	0.872	1.089	1.497	1.886	2.266	2.644	3.020
9	0.695	0.795	0.993	1.365	1.719	2.066	2.410	2.753
10	0.641	0.733	0.916	1.259	1.586	1.906	2.223	2.540
15	0.478	0.546	0.682	0.938	1.182	1.420	1.657	1.893
20	0.394	0.451	0.563	0.775	0.976	1.173	1.368	1.562
25	0.343	0.393	0.490	0.674	0.849	1.021	1.191	1.360
30	0.309	0.353	0.441	0.606	0.764	0.918	1.070	1.223
35	0.284	0.324	0.405	0.557	0.701	0.843	0.983	1.123
40	0.264	0.302	0.377	0.519	0.654	0.786	0.917	1.047
45	0.249	0.285	0.356	0.489	0.617	0.741	0.864	0.987
50	0.237	0.271	0.338	0.465	0.586	0.705	0.822	0.939
60	0.218	0.250	0.312	0.429	0.540	0.649	0.757	0.865
70	0.205	0.234	0.292	0.402	0.507	0.609	0.710	0.811
80	0.194	0.222	0.278	0.382	0.481	0.578	0.674	0.770
90	0.186	0.213	0.266	0.366	0.461	0.554	0.646	0.738
100	0.180	0.205	0.256	0.353	0.444	0.534	0.623	0.711

A = 1.86 Alpha = 0.03
B = -0.29 Beta = 1.045
C = 0.100 Gamma = 1.15

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [27] IGUACU
River : Jordao
Site : Santa Clara
C.A. = 3,913 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	22.447	24.894	29.352	37.016	43.739	49.929	55.771	61.364
3	18.877	20.935	24.684	31.129	36.783	41.988	46.901	51.605
4	16.988	18.840	22.213	28.013	33.101	37.786	42.207	46.440
5	15.758	17.476	20.605	25.985	30.704	35.050	39.151	43.078
6	14.871	16.492	19.445	24.523	28.976	33.077	36.948	40.653
7	14.190	15.738	18.556	23.401	27.651	31.564	35.257	38.793
8	13.646	15.134	17.844	22.503	26.590	30.353	33.904	37.305
9	13.197	14.636	17.257	21.762	25.715	29.354	32.788	36.077
10	12.818	14.215	16.761	21.137	24.976	28.511	31.847	35.041
15	11.532	12.790	15.080	19.017	22.471	25.651	28.653	31.527
20	10.762	11.935	14.072	17.746	20.969	23.937	26.738	29.420
25	10.231	11.347	13.379	16.872	19.936	22.758	25.420	27.970
30	9.837	10.909	12.863	16.221	19.167	21.880	24.440	26.891
35	9.528	10.566	12.458	15.711	18.565	21.192	23.672	26.046
40	9.277	10.288	12.130	15.297	18.076	20.634	23.048	25.360
45	9.067	10.056	11.857	14.952	17.668	20.169	22.528	24.788
50	8.889	9.858	11.624	14.659	17.321	19.772	22.086	24.301
60	8.600	9.538	11.246	14.182	16.758	19.129	21.367	23.510
70	8.373	9.286	10.949	13.808	16.315	18.624	20.803	22.890
80	8.188	9.081	10.707	13.503	15.956	18.214	20.345	22.385
90	8.034	8.910	10.506	13.249	15.655	17.871	19.962	21.964
100	7.903	8.765	10.334	13.033	15.400	17.579	19.636	21.605

A = 1.88 Alpha = 0.22
B = -0.19 Beta = 1.100
C = 0.070 Gamma = 2.33

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [28] IGUACU
River : Chopim
Site : Aguas do Vere
C.A. = 6,696 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	22.188	25.119	30.886	41.527	51.467	61.053	70.444	79.727
3	17.713	20.053	24.657	33.152	41.087	48.739	56.237	63.647
4	15.394	17.428	21.428	28.811	35.707	42.358	48.873	55.313
5	13.905	15.742	19.356	26.025	32.254	38.262	44.147	49.965
6	12.843	14.540	17.878	24.038	29.791	35.340	40.776	46.149
7	12.036	13.626	16.754	22.526	27.918	33.118	38.212	43.248
8	11.394	12.900	15.861	21.325	26.430	31.353	36.176	40.942
9	10.868	12.304	15.129	20.341	25.210	29.906	34.506	39.053
10	10.427	11.805	14.515	19.515	24.186	28.691	33.105	37.467
15	8.949	10.131	12.457	16.748	20.757	24.623	28.411	32.154
20	8.077	9.144	11.244	15.117	18.736	22.225	25.644	29.023
25	7.485	8.474	10.419	14.009	17.362	20.596	23.764	26.895
30	7.049	7.980	9.812	13.192	16.350	19.395	22.378	25.327
35	6.709	7.596	9.340	12.557	15.563	18.462	21.302	24.109
40	6.436	7.286	8.959	12.046	14.929	17.710	20.434	23.126
45	6.209	7.030	8.644	11.622	14.403	17.086	19.714	22.312
50	6.018	6.813	8.377	11.263	13.958	16.558	19.105	21.623
60	5.708	6.462	7.946	10.683	13.241	15.707	18.123	20.511
70	5.467	6.190	7.611	10.233	12.682	15.044	17.358	19.645
80	5.273	5.969	7.340	9.868	12.230	14.508	16.740	18.946
90	5.111	5.787	7.115	9.566	11.856	14.064	16.228	18.366
100	4.974	5.632	6.924	9.310	11.539	13.688	15.793	17.874

A = 1.42 Alpha = 0.10
B = -0.27 Beta = 1.115
C = 0.093 Gamma = 2.10

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [*G] IGUACU
River : Iguacu
Site : Porto Meira
C.A. = 55,048 km2

TR (years)	Duration(days) 7	15	30	60	90	120	150	180
2	284.366	297.326	349.467	460.953	571.760	682.316	793.369	905.391
3	230.606	241.116	283.400	373.809	463.668	553.323	643.381	734.226
4	203.790	213.078	250.444	330.341	409.750	488.980	568.565	648.846
5	187.017	195.540	229.831	303.151	376.025	448.733	521.769	595.441
6	175.284	183.273	215.413	284.133	352.435	420.582	489.036	558.087
7	166.501	174.090	204.619	269.896	334.775	399.508	464.531	530.122
8	159.617	166.892	196.159	258.737	320.934	382.990	445.325	508.204
9	154.039	161.060	189.304	249.695	309.719	369.606	429.763	490.445
10	149.405	156.214	183.608	242.182	300.400	358.485	416.832	475.688
15	134.221	140.338	164.949	217.570	269.871	322.054	374.471	427.345
20	125.547	131.268	154.288	203.509	252.430	301.240	350.269	399.727
25	119.783	125.243	147.206	194.167	240.842	287.412	334.190	381.378
30	115.611	120.880	142.078	187.403	232.452	277.400	322.549	368.092
35	112.416	117.539	138.152	182.225	226.029	269.735	313.636	357.921
40	109.872	114.880	135.026	178.102	220.915	263.631	306.539	349.822
45	107.787	112.699	132.463	174.721	216.722	258.627	300.721	343.182
50	106.039	110.871	130.314	171.887	213.206	254.432	295.843	337.615
60	103.253	107.959	126.891	167.372	207.605	247.748	288.071	328.747
70	101.116	105.724	124.264	163.907	203.308	242.619	282.108	321.941
80	99.411	103.941	122.169	161.143	199.879	238.528	277.351	316.512
90	98.011	102.478	120.449	158.874	197.066	235.170	273.446	312.057
100	96.836	101.250	119.005	156.970	194.704	232.352	270.169	308.316

A = 2.21 Alpha = 0.26
B = -0.50 Beta = 1.110
C = 0.120 Gamma = 1.78

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [29] RIBEIRA
River : Ribeira
Site : Capela do Ribeira
C.A. = 7,252 km2

TR (years)	Duration(days) 7	15	30	60	90	120	150	180
2	58.651	61.540	65.600	71.286	75.507	78.967	81.946	84.589
3	52.028	54.591	58.193	63.236	66.981	70.050	72.693	75.037
4	48.817	51.221	54.601	59.333	62.847	65.726	68.206	70.406
5	46.846	49.153	52.397	56.938	60.309	63.073	65.453	67.563
6	45.488	47.728	50.877	55.286	58.560	61.244	63.554	65.604
7	44.482	46.673	49.753	54.065	57.266	59.890	62.150	64.154
8	43.702	45.854	48.880	53.116	56.262	58.840	61.060	63.029
9	43.075	45.197	48.179	52.354	55.455	57.996	60.184	62.125
10	42.558	44.654	47.601	51.726	54.789	57.300	59.462	61.379
15	40.892	42.906	45.737	49.701	52.644	55.057	57.134	58.976
20	39.962	41.930	44.697	48.571	51.447	53.805	55.835	57.635
25	39.355	41.293	44.017	47.832	50.665	52.986	54.985	56.759
30	38.920	40.837	43.532	47.305	50.106	52.402	54.379	56.132
35	38.591	40.492	43.164	46.905	49.682	51.959	53.919	55.658
40	38.332	40.220	42.874	46.589	49.348	51.610	53.557	55.284
45	38.121	39.998	42.638	46.333	49.077	51.326	53.262	54.979
50	37.945	39.814	42.441	46.119	48.850	51.089	53.016	54.726
60	37.668	39.523	42.131	45.782	48.494	50.716	52.629	54.326
70	37.458	39.302	41.896	45.527	48.222	50.432	52.335	54.023
80	37.291	39.128	41.710	45.324	48.008	50.208	52.102	53.783
90	37.156	38.986	41.558	45.160	47.834	50.026	51.913	53.587
100	37.043	38.867	41.432	45.022	47.688	49.874	51.755	53.424

A = 2.13 Alpha = 0.57
B = -0.03 Beta = 1.041
C = 0.020 Gamma = 1.60

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [*H] RIBEIRA
River : Ribeira
Site : Iporanga
C.A. = 9,129 km2

TR	Duration[days]							
[years]	7	15	30	60	90	120	150	180
2	69.275	71.044	74.173	78.942	82.606	85.649	88.287	90.637
3	62.193	63.781	66.591	70.873	74.162	76.894	79.262	81.372
4	58.823	60.325	62.982	67.032	70.143	72.727	74.967	76.963
5	56.781	58.231	60.795	64.705	67.708	70.202	72.364	74.290
6	55.386	56.800	59.302	63.116	66.045	68.478	70.587	72.466
7	54.362	55.750	58.206	61.949	64.824	67.212	69.282	71.126
8	53.573	54.941	57.360	61.049	63.882	66.235	68.276	70.093
9	52.942	54.294	56.685	60.330	63.130	65.456	67.472	69.268
10	52.424	53.763	56.131	59.740	62.513	64.816	66.812	68.590
15	50.774	52.070	54.364	57.860	60.545	62.775	64.709	66.431
20	49.867	51.140	53.392	56.826	59.463	61.653	63.553	65.244
25	49.280	50.538	52.764	56.157	58.764	60.928	62.805	64.477
30	48.865	50.112	52.320	55.684	58.268	60.415	62.276	63.933
35	48.552	49.792	51.985	55.328	57.896	60.028	61.878	63.525
40	48.307	49.541	51.723	55.049	57.604	59.726	61.565	63.204
45	48.109	49.338	51.511	54.823	57.367	59.481	61.313	62.945
50	47.945	49.169	51.335	54.636	57.172	59.278	61.104	62.730
60	47.688	48.905	51.059	54.342	56.864	58.959	60.775	62.393
70	47.493	48.706	50.851	54.121	56.633	58.719	60.528	62.139
80	47.341	48.549	50.688	53.947	56.451	58.530	60.333	61.939
90	47.217	48.423	50.556	53.806	56.304	58.378	60.176	61.778
100	47.115	48.318	50.446	53.690	56.181	58.251	60.045	61.643

A = 2.13 Alpha = 0.62
B = -0.06 Beta = 1.028
C = 0.020 Gamma = 1.50

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [30] Litoranea
River : -------
Site : Morretes-1
C.A. = 217 km2

TR	Duration[days]							
[years]	7	15	30	60	90	120	150	180
2	2.226	2.520	2.967	3.665	4.240	4.750	5.216	5.652
3	1.860	2.105	2.478	3.061	3.542	3.968	4.357	4.722
4	1.681	1.903	2.240	2.767	3.201	3.586	3.938	4.267
5	1.570	1.778	2.093	2.585	2.991	3.350	3.680	3.987
6	1.494	1.691	1.991	2.459	2.846	3.188	3.501	3.793
7	1.437	1.627	1.916	2.366	2.738	3.067	3.368	3.649
8	1.393	1.577	1.857	2.294	2.654	2.973	3.265	3.538
9	1.358	1.537	1.810	2.235	2.586	2.897	3.182	3.447
10	1.329	1.504	1.771	2.187	2.530	2.834	3.113	3.373
15	1.234	1.397	1.644	2.031	2.350	2.632	2.891	3.132
20	1.181	1.336	1.573	1.943	2.248	2.519	2.766	2.997
25	1.146	1.297	1.527	1.886	2.182	2.444	2.684	2.908
30	1.121	1.268	1.493	1.845	2.134	2.391	2.626	2.845
35	1.102	1.247	1.468	1.813	2.098	2.350	2.581	2.797
40	1.087	1.230	1.448	1.789	2.069	2.318	2.546	2.758
45	1.074	1.216	1.432	1.768	2.046	2.292	2.517	2.727
50	1.064	1.205	1.418	1.752	2.027	2.270	2.493	2.701
60	1.048	1.186	1.397	1.725	1.996	2.236	2.455	2.660
70	1.036	1.172	1.380	1.705	1.972	2.209	2.426	2.629
80	1.026	1.161	1.367	1.689	1.954	2.189	2.404	2.604
90	1.018	1.152	1.357	1.676	1.939	2.172	2.385	2.584
100	1.011	1.145	1.348	1.665	1.926	2.158	2.369	2.567

A = 2.35 Alpha = 0.38
B = -0.07 Beta = 1.065
C = 0.050 Gamma = 1.64

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [31] Litoranea
River : -------
Site : Morretes-2
C.A. = 53 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	0.514	0.595	0.716	0.902	1.057	1.194	1.320	1.438
3	0.438	0.507	0.610	0.769	0.901	1.018	1.125	1.226
4	0.401	0.464	0.558	0.704	0.824	0.931	1.030	1.122
5	0.378	0.438	0.526	0.663	0.777	0.878	0.971	1.057
6	0.362	0.419	0.504	0.636	0.744	0.841	0.930	1.013
7	0.350	0.406	0.488	0.615	0.720	0.814	0.900	0.980
8	0.341	0.395	0.475	0.599	0.701	0.792	0.876	0.954
9	0.334	0.386	0.464	0.586	0.686	0.775	0.857	0.934
10	0.327	0.379	0.456	0.575	0.673	0.761	0.841	0.917
15	0.308	0.356	0.428	0.540	0.633	0.715	0.790	0.861
20	0.297	0.343	0.413	0.521	0.610	0.689	0.762	0.830
25	0.289	0.335	0.403	0.508	0.595	0.672	0.743	0.810
30	0.284	0.329	0.395	0.499	0.584	0.660	0.730	0.795
35	0.280	0.324	0.390	0.492	0.576	0.651	0.719	0.784
40	0.277	0.321	0.385	0.486	0.569	0.643	0.711	0.775
45	0.274	0.318	0.382	0.482	0.564	0.637	0.705	0.768
50	0.272	0.315	0.379	0.478	0.560	0.632	0.699	0.762
60	0.269	0.311	0.374	0.472	0.553	0.624	0.690	0.752
70	0.266	0.308	0.371	0.467	0.547	0.618	0.684	0.745
80	0.264	0.306	0.368	0.464	0.543	0.614	0.679	0.739
90	0.262	0.304	0.365	0.461	0.540	0.610	0.674	0.735
100	0.261	0.302	0.363	0.458	0.537	0.607	0.671	0.731

A = 2.22 Alpha = 0.44
B = -0.04 Beta = 1.067
C = 0.050 Gamma = 1.65

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [Ex] TIBAGI
River : Tibagi
Site : Example
C.A. = 369 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	1.014	1.082	1.270	1.641	1.993	2.334	2.668	2.998
3	0.812	0.866	1.017	1.313	1.595	1.868	2.136	2.400
4	0.720	0.769	0.902	1.166	1.416	1.658	1.896	2.130
5	0.667	0.712	0.836	1.080	1.311	1.536	1.755	1.973
6	0.632	0.674	0.791	1.022	1.242	1.454	1.662	1.868
7	0.606	0.647	0.760	0.981	1.192	1.396	1.595	1.793
8	0.587	0.627	0.735	0.950	1.154	1.351	1.545	1.736
9	0.572	0.611	0.717	0.926	1.124	1.317	1.505	1.692
10	0.560	0.597	0.701	0.906	1.100	1.288	1.473	1.655
15	0.522	0.557	0.654	0.845	1.026	1.201	1.374	1.544
20	0.502	0.536	0.629	0.813	0.987	1.156	1.321	1.485
25	0.490	0.523	0.613	0.792	0.963	1.127	1.289	1.448
30	0.481	0.513	0.603	0.779	0.946	1.107	1.266	1.423
35	0.475	0.507	0.595	0.768	0.933	1.093	1.249	1.404
40	0.470	0.502	0.589	0.760	0.924	1.082	1.236	1.390
45	0.466	0.497	0.584	0.754	0.916	1.073	1.226	1.378
50	0.463	0.494	0.580	0.749	0.910	1.065	1.218	1.369
60	0.458	0.489	0.574	0.741	0.900	1.054	1.205	1.354
70	0.454	0.485	0.569	0.735	0.893	1.046	1.195	1.343
80	0.452	0.482	0.566	0.731	0.887	1.039	1.188	1.335
90	0.449	0.480	0.563	0.727	0.883	1.034	1.182	1.329
100	0.448	0.478	0.561	0.724	0.880	1.030	1.177	1.323

A = 1.50 Alpha = 0.37
B = -0.38 Beta = 1.050
C = 0.100 Gamma = 1.27

I-4 Computation Results of Drought Discharge by Basin

Drought Discharge [Return Period(10years)' Duration Time(7days)] Unit:m3/s

No.	Basin	River	Site Name	Area [km2]	Q10,7 [m3/s]	[m3/s/100km2]
[1]	Cinzas	Cinzas	CZ-1	1,970	3.577	0.182
[2]	Cinzas	Cinzas	CZ-2	9,291	9.889	0.106
[3]	Iguacu	Iguacu	IG-1	3,590	7.633	0.213
[4]	Iguacu	Iguacu	IG-2	18,300	41.654	0.228
[5]	Iguacu	Iguacu	IG-3	38,670	87.107	0.225
[6]	Iguacu	Iguacu	IG-4	57,000	120.230	0.211
[7]	Iguacu	Iguacu	IG-5	68,700	186.457	0.271
[8]	Itarare	Itarare	IT-1	5,198	15.286	0.294
[9]	Ivai	Ivai	IV-1	3,170	4.204	0.133
[10]	Ivai	Ivai	IV-2	8,442	7.623	0.090
[11]	Ivai	Ivai	IV-3	19,992	20.318	0.102
[12]	Ivai	Ivai	IV-4	29,206	145.994	0.500
[13]	Ivai	Ivai	IV-5	35,879	133.156	0.371
[14]	Litoranea	Litoranea	LT-1	5,766	40.089	0.695
[15]	Parana-1	Parana-1	PA-1	1,332	9.085	0.682
[16]	Parana-2	Parana-2	PA-2	3,157	10.831	0.343
[17]	Parana-3	Parana-3	PA-3	8,668	21.163	0.244
[18]	Parana Pane	Parana Panema-	PP-1	1,246	2.598	0.209
[19]	Parana Pane	Parana Panema-	PP-2	695	0.697	0.100
[20]	Parana Pane	Parana Panema-	PP-3	3,712	8.336	0.225
[21]	Parana Pane	Parana Panema-	PP-4	4,144	13.551	0.327
[22]	Piguiri	Piguiri	PQ-1	8,745	29.475	0.337
[23]	Piguiri	Piguiri	PQ-2	18,969	107.788	0.568
[24]	Piguiri	Piguiri	PQ-3	24,708	87.084	0.352
[25]	Pirapo	Pirapo	PR-1	5,006	17.665	0.353
[26]	Ribeira	Ribeira	RB-1	4,016	20.281	0.505
[27]	Ribeira	Ribeira	RB-2	9,129	51.874	0.568
[28]	Tibagi	Tibagi	TB-1	5,148	8.591	0.167
[29]	Tibagi	Tibagi	TB-2	16,475	25.520	0.155
[30]	Tibagi	Tibagi	TB-3	24,635	33.691	0.137

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [1] Cinzas
River : Cinzas
Site : CZ-1
C.A. = 1,970 km2

TR (years)	Duration (days) 7	15	30	60	90	120	150	180
2	7.517	8.088	9.137	10.883	12.354	13.666	14.871	16.000
3	5.865	6.310	7.129	8.491	9.638	10.662	11.603	12.483
4	5.077	5.462	6.171	7.350	8.344	9.230	10.044	10.806
5	4.599	4.948	5.590	6.658	7.558	8.361	9.098	9.789
6	4.272	4.596	5.193	6.185	7.021	7.766	8.452	9.093
7	4.032	4.338	4.901	5.837	6.626	7.330	7.977	8.582
8	3.847	4.139	4.676	5.569	6.322	6.993	7.610	8.188
9	3.699	3.979	4.496	5.355	6.078	6.724	7.317	7.872
10	3.577	3.848	4.348	5.179	5.878	6.503	7.076	7.613
15	3.189	3.431	3.876	4.617	5.241	5.797	6.309	6.787
20	2.975	3.201	3.616	4.307	4.889	5.408	5.886	6.332
25	2.837	3.052	3.448	4.107	4.662	5.157	5.612	6.038
30	2.739	2.947	3.329	3.965	4.501	4.979	5.418	5.829
35	2.665	2.867	3.239	3.858	4.379	4.845	5.272	5.672
40	2.607	2.805	3.169	3.774	4.284	4.739	5.157	5.549
45	2.560	2.754	3.112	3.706	4.207	4.654	5.065	5.449
50	2.521	2.713	3.065	3.650	4.143	4.583	4.988	5.366
60	2.460	2.647	2.990	3.562	4.043	4.473	4.867	5.236
70	2.414	2.597	2.934	3.495	3.968	4.389	4.776	5.139
80	2.378	2.558	2.890	3.443	3.908	4.323	4.704	5.061
90	2.349	2.527	2.855	3.400	3.860	4.270	4.646	4.999
100	2.324	2.501	2.825	3.365	3.820	4.226	4.598	4.947

A = 1.54 Alpha = 0.24
B = -0.16 Beta = 1.090
C = 0.055 Gamma = 1.51

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [2] Cinzas
River : Cinzas
Site : CZ-2
C.A. = 9,291 km2

TR (years)	Duration (days) 7	15	30	60	90	120	150	180
2	20.079	20.767	23.425	28.781	33.779	38.520	43.086	47.528
3	15.566	16.099	18.159	22.312	26.186	29.862	33.401	36.845
4	13.520	13.983	15.773	19.380	22.745	25.937	29.012	32.003
5	12.321	12.743	14.373	17.660	20.727	23.636	26.438	29.163
6	11.521	11.916	13.441	16.515	19.382	22.103	24.723	27.271
7	10.946	11.321	12.770	15.690	18.415	21.000	23.489	25.910
8	10.511	10.871	12.262	15.066	17.682	20.163	22.554	24.879
9	10.167	10.516	11.861	14.574	17.104	19.505	21.817	24.066
10	9.889	10.228	11.537	14.175	16.637	18.972	21.221	23.408
15	9.027	9.337	10.531	12.940	15.186	17.318	19.371	21.368
20	8.572	8.865	10.000	12.287	14.420	16.444	18.393	20.290
25	8.286	8.570	9.666	11.877	13.939	15.895	17.780	19.612
30	8.088	8.365	9.435	11.593	13.606	15.515	17.355	19.143
35	7.941	8.213	9.264	11.383	13.360	15.235	17.041	18.797
40	7.828	8.097	9.133	11.221	13.170	15.018	16.799	18.530
45	7.738	8.004	9.028	11.092	13.018	14.846	16.605	18.317
50	7.665	7.927	8.942	10.987	12.894	14.704	16.447	18.143
60	7.551	7.810	8.809	10.823	12.703	14.486	16.203	17.873
70	7.467	7.722	8.711	10.703	12.561	14.324	16.022	17.674
80	7.402	7.655	8.635	10.609	12.451	14.199	15.882	17.520
90	7.349	7.601	8.574	10.535	12.364	14.099	15.771	17.396
100	7.307	7.557	8.524	10.474	12.292	14.018	15.679	17.295

A = 1.31 Alpha = 0.29
B = -0.37 Beta = 1.041
C = 0.089 Gamma = 1.29

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3/

Basin : [3] Iguacu
River : Iguacu
Site : IG-1
C.A. = 3,590 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	
2	13.288	14.544	16.809	20.619	23.886	26.844	29.597	32.
3	11.206	12.266	14.175	17.388	20.144	22.639	24.960	27.
4	10.098	11.053	12.774	15.669	18.153	20.400	22.492	24.
5	9.374	10.261	11.858	14.546	16.851	18.938	20.880	22.
6	8.851	9.688	11.196	13.734	15.910	17.880	19.714	21.
7	8.448	9.247	10.687	13.109	15.187	17.067	18.817	20.
8	8.125	8.894	10.278	12.608	14.606	16.415	18.098	19.
9	7.859	8.602	9.941	12.194	14.127	15.876	17.504	19.
10	7.633	8.355	9.656	11.844	13.722	15.421	17.002	18.
15	6.866	7.515	8.686	10.654	12.343	13.871	15.294	16.
20	6.404	7.010	8.101	9.937	11.512	12.938	14.265	15.
25	6.085	6.661	7.698	9.443	10.939	12.294	13.554	14.
30	5.847	6.400	7.397	9.073	10.511	11.813	13.024	14.
35	5.661	6.196	7.161	8.784	10.176	11.436	12.608	13.
40	5.509	6.030	6.968	8.548	9.903	11.129	12.270	13.
45	5.382	5.891	6.808	8.351	9.675	10.873	11.988	13.
50	5.274	5.772	6.671	8.183	9.480	10.654	11.747	12.
60	5.098	5.580	6.449	7.910	9.164	10.299	11.355	12.
70	4.959	5.428	6.274	7.696	8.915	10.019	11.047	12.
80	4.847	5.305	6.131	7.521	8.713	9.792	10.796	11.
90	4.753	5.202	6.012	7.374	8.543	9.601	10.586	11.
100	4.672	5.114	5.910	7.250	8.399	9.439	10.407	11.

A = 1.44 Alpha = 0.
B = -0.17 Beta = 1.
C = 0.062 Gamma = 2.

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3/

Basin : [4] Iguacu
River : Iguacu
Site : IG-2
C.A. = 18,300 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	1
2	75.345	82.489	98.085	127.165	154.078	179.759	204.680	229.1
3	62.633	68.572	81.537	105.710	128.083	149.431	170.148	190.4
4	56.000	61.309	72.901	94.515	114.518	133.605	152.128	170.2
5	51.723	56.627	67.333	87.296	105.771	123.400	140.508	157.2
6	48.661	53.275	63.347	82.128	99.510	116.096	132.191	147.9
7	46.325	50.718	60.307	78.187	94.734	110.524	125.847	140.8
8	44.466	48.682	57.886	75.048	90.932	106.087	120.795	135.2
9	42.939	47.010	55.898	72.470	87.808	102.444	116.646	130.5
10	41.654	45.604	54.226	70.303	85.182	99.379	113.157	126.6
15	37.335	40.874	48.602	63.012	76.348	89.073	101.422	113.5
20	34.774	38.071	45.270	58.691	71.112	82.965	94.467	105.7
25	33.027	36.159	42.995	55.743	67.540	78.797	89.722	100.4
30	31.736	34.745	41.314	53.563	64.899	75.716	86.213	96.5
35	30.730	33.643	40.004	51.865	62.841	73.315	83.480	93.4
40	29.917	32.753	38.946	50.492	61.179	71.375	81.271	90.9
45	29.241	32.014	38.067	49.353	59.798	69.765	79.437	88.9
50	28.669	31.387	37.321	48.386	58.627	68.398	77.881	87.1
60	27.743	30.374	36.116	46.824	56.734	66.190	75.367	84.3
70	27.021	29.583	35.176	45.605	55.256	64.466	73.404	82.1
80	26.436	28.942	34.414	44.617	54.060	63.071	71.815	80.3
90	25.949	28.410	33.781	43.797	53.066	61.911	70.494	78.9
100	25.537	27.958	33.244	43.100	52.222	60.926	69.372	77.6

A = 1.70 Alpha = 0.2
B = -0.30 Beta = 1.0
C = 0.090 Gamma = 2.1

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3/s

Basin : [5] Iguacu
River : Iguacu
Site : IG-3
C.A. = 38,670 km2

TR ears] \ Duration[days]	7	15	30	60	90	120	150	180
2	198.617	222.393	266.387	343.589	412.656	477.197	538.841	598.471
3	149.365	167.246	200.330	258.388	310.328	358.864	405.223	450.066
4	126.983	142.184	170.311	219.668	263.825	305.088	344.500	382.623
5	113.832	127.458	152.672	196.918	236.502	273.492	308.821	342.997
6	105.060	117.637	140.908	181.744	218.278	252.418	285.025	316.567
7	98.742	110.562	132.434	170.814	205.151	237.237	267.883	297.528
8	93.948	105.194	126.003	162.520	195.190	225.718	254.876	283.082
9	90.170	100.964	120.937	155.985	187.341	216.642	244.628	271.699
10	87.107	97.535	116.829	150.687	180.978	209.284	236.319	262.471
15	77.598	86.887	104.075	134.236	161.220	186.436	210.519	233.816
20	72.561	81.247	97.319	125.523	150.755	174.334	196.854	218.639
25	69.393	77.700	93.070	120.043	144.174	166.723	188.260	209.094
30	67.196	75.240	90.124	116.243	139.610	161.445	182.301	202.475
35	65.573	73.423	87.947	113.435	136.238	157.546	177.898	197.584
40	64.320	72.019	86.266	111.267	133.633	154.534	174.497	193.807
45	63.319	70.898	84.924	109.535	131.554	152.129	171.781	190.791
50	62.499	69.980	83.824	108.117	129.850	150.159	169.557	188.321
60	61.231	68.561	82.124	105.924	127.217	147.114	166.118	184.501
70	60.292	67.510	80.865	104.300	125.266	144.858	163.571	181.672
80	59.566	66.696	79.890	103.043	123.756	143.112	161.599	179.482
90	58.985	66.045	79.111	102.038	122.549	141.716	160.023	177.731
100	58.508	65.512	78.472	101.213	121.559	140.571	158.730	176.296

A = 1.90 Alpha = 0.23
B = -0.21 Beta = 1.070
C = 0.077 Gamma = 1.30

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3/s

Basin : [6] Iguacu
River : Iguacu
Site : IG-4
C.A. = 57,000 km2

TR ears] \ Duration[days]	7	15	30	60	90	120	150	180
2	251.832	274.338	321.473	406.806	483.806	555.924	624.858	691.559
3	197.117	214.734	251.628	318.421	378.692	435.141	489.098	541.307
4	170.826	186.093	218.066	275.950	328.182	377.102	423.862	469.107
5	154.789	168.622	197.594	250.044	297.372	341.699	384.070	425.067
6	143.784	156.634	183.545	232.266	276.230	317.405	356.763	394.846
7	135.671	147.796	173.190	219.162	260.645	299.497	336.635	372.569
8	129.395	140.960	165.178	209.023	248.588	285.643	321.062	355.334
9	124.367	135.482	158.759	200.900	238.927	274.542	308.586	341.525
10	120.230	130.975	153.478	194.217	230.979	265.409	298.320	330.164
15	106.966	116.526	136.546	172.792	205.498	236.130	265.410	293.741
20	99.615	108.518	127.163	160.917	191.376	219.903	247.171	273.555
25	94.838	103.314	121.064	153.200	182.198	209.357	235.317	260.436
30	91.439	99.611	116.725	147.709	175.667	201.853	226.882	251.101
35	88.873	96.816	113.450	143.564	170.738	196.189	220.516	244.055
40	86.855	94.617	110.873	140.304	166.861	191.734	215.509	238.513
45	85.218	92.834	108.784	137.660	163.716	188.120	211.447	234.018
50	83.858	91.353	107.048	135.463	161.104	185.118	208.073	230.284
60	81.718	89.021	104.316	132.006	156.992	180.394	202.763	224.406
70	80.099	87.257	102.249	129.390	153.881	176.819	198.745	219.960
80	78.823	85.867	100.620	127.329	151.430	174.002	195.579	216.456
90	77.786	84.738	99.297	125.655	149.439	171.714	193.007	213.609
100	76.924	83.799	98.197	124.262	147.783	169.812	190.869	211.243

A = 1.80 Alpha = 0.23
B = -0.26 Beta = 1.072
C = 0.080 Gamma = 1.55

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3/

Basin : [7] Iguacu
River : Iguacu
Site : IG-5
C.A. = 68,700 km2

TR (years) \ Duration (days)	7	15	30	60	90	120	150	1
2	354.889	371.063	436.135	575.270	713.557	851.531	990.125	1112
3	287.797	300.913	353.683	466.515	578.658	690.548	802.941	916.
4	254.330	265.921	312.555	412.266	511.369	610.248	709.571	809.
5	233.397	244.034	286.829	378.333	469.279	560.020	651.168	743.
6	218.755	228.725	268.835	354.599	439.840	524.888	610.318	696.
7	207.794	217.264	255.365	336.831	417.800	498.587	579.736	661.
8	199.203	208.281	244.807	322.904	400.526	477.972	555.766	634.
9	192.241	201.003	236.252	311.620	386.529	461.269	536.345	612.
10	186.457	194.955	229.143	302.244	374.899	447.390	520.207	593.
15	167.508	175.142	205.856	271.528	336.799	401.923	467.340	533.
20	156.682	163.823	192.552	253.980	315.033	375.948	437.137	498.
25	149.490	156.303	183.713	242.321	300.571	358.690	417.070	475.
30	144.282	150.858	177.313	233.880	290.101	346.195	402.542	459.
35	140.296	146.689	172.414	227.417	282.085	336.629	391.418	446.
40	137.121	143.370	168.512	222.271	275.702	329.012	382.562	436.
45	134.518	140.649	165.314	218.052	270.469	322.767	375.301	428.
50	132.336	138.367	162.632	214.515	266.082	317.531	369.212	421.
60	128.860	134.733	158.360	208.880	259.092	309.190	359.514	410.
70	126.192	131.944	155.082	204.556	253.728	302.790	352.071	401.
80	124.065	129.719	152.467	201.107	249.450	297.684	346.134	395.
90	122.318	127.893	150.321	198.275	245.938	293.493	341.262	389.
100	120.852	126.360	148.519	195.899	242.990	289.975	337.171	384.

A = 2.21 Alpha = 0.
B = -0.50 Beta = 1.
C = 0.120 Gamma = 1.

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3/

Basin : [8] Itarare
River : Itarare
Site : IT-1
C.A. = 5,198 km2

TR (years) \ Duration (days)	7	15	30	60	90	120	150	1
2	22.216	23.200	25.076	28.111	30.567	32.685	34.578	36.
3	19.335	20.191	21.823	24.465	26.602	28.446	30.093	31.
4	17.950	18.745	20.260	22.713	24.697	26.408	27.938	29.
5	17.106	17.863	19.307	21.644	23.535	25.166	26.624	27.
6	16.526	17.258	18.653	20.911	22.737	24.313	25.721	27.
7	16.099	16.812	18.171	20.370	22.150	23.685	25.056	26.
8	15.768	16.466	17.798	19.952	21.695	23.198	24.542	25.
9	15.503	16.190	17.499	19.617	21.330	22.809	24.130	25.
10	15.286	15.962	17.253	19.341	21.031	22.488	23.791	24.
15	14.587	15.233	16.464	18.457	20.070	21.460	22.703	23.
20	14.200	14.829	16.027	17.967	19.537	20.891	22.101	23.
25	13.948	14.566	15.743	17.649	19.191	20.521	21.709	22.
30	13.769	14.379	15.541	17.422	18.944	20.257	21.431	22.
35	13.634	14.238	15.389	17.251	18.759	20.059	21.220	22.
40	13.528	14.127	15.269	17.117	18.612	19.902	21.055	22.
45	13.442	14.037	15.172	17.008	18.494	19.775	20.921	21.
50	13.370	13.962	15.091	16.917	18.395	19.670	20.809	21.
60	13.257	13.844	14.963	16.775	18.240	19.504	20.634	21.
70	13.172	13.755	14.867	16.667	18.123	19.379	20.501	21.
80	13.105	13.685	14.791	16.582	18.030	19.280	20.397	21.
90	13.050	13.628	14.730	16.513	17.955	19.200	20.312	21.
100	13.005	13.581	14.679	16.455	17.893	19.133	20.241	21.

A = 1.61 Alpha = 0.
B = -0.12 Beta = 1.
C = 0.038 Gamma = 1.

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3/s

Basin : [9] Ivai
River : Ivai
Site : IV-1
C.A. = 3,170 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	7.150	7.722	9.414	12.967	16.549	20.179	23.879	27.658
3	5.796	6.260	7.632	10.512	13.416	16.359	19.358	22.421
4	5.204	5.621	6.853	9.439	12.046	14.688	17.381	20.132
5	4.865	5.255	6.406	8.824	11.261	13.732	16.249	18.821
6	4.644	5.015	6.115	8.422	10.748	13.106	15.509	17.963
7	4.486	4.846	5.908	8.137	10.384	12.663	14.984	17.355
8	4.369	4.719	5.753	7.924	10.112	12.331	14.591	16.900
9	4.277	4.620	5.632	7.757	9.900	12.072	14.285	16.546
10	4.204	4.540	5.535	7.624	9.730	11.864	14.039	16.261
15	3.980	4.299	5.241	7.219	9.212	11.234	13.293	15.397
20	3.865	4.175	5.090	7.011	8.947	10.910	12.910	14.953
25	3.795	4.099	4.997	6.883	8.784	10.711	12.675	14.680
30	3.747	4.047	4.934	6.796	8.673	10.575	12.514	14.495
35	3.712	4.009	4.888	6.732	8.592	10.477	12.397	14.359
40	3.685	3.980	4.853	6.684	8.530	10.401	12.308	14.256
45	3.664	3.958	4.825	6.646	8.481	10.342	12.238	14.175
50	3.647	3.939	4.802	6.615	8.442	10.294	12.181	14.108
60	3.621	3.911	4.768	6.567	8.381	10.220	12.094	14.007
70	3.602	3.890	4.743	6.533	8.337	10.166	12.030	13.934
80	3.587	3.875	4.724	6.506	8.303	10.125	11.981	13.877
90	3.576	3.862	4.709	6.485	8.277	10.092	11.943	13.833
100	3.567	3.852	4.696	6.468	8.255	10.066	11.911	13.797

A = 1.43 Alpha = 0.42
B = -0.49 Beta = 1.030
C = 0.127 Gamma = 1.17

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3/s

Basin : [10] Ivai
River : Ivai
Site : IV-2
C.A. = 8,442 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	14.199	14.641	17.408	23.769	30.409	37.272	44.367	51.703
3	11.295	11.646	13.847	18.907	24.189	29.647	35.291	41.127
4	9.975	10.285	12.229	16.698	21.362	26.183	31.167	36.321
5	9.199	9.485	11.278	15.399	19.701	24.147	28.744	33.497
6	8.682	8.952	10.644	14.533	18.593	22.789	27.127	31.613
7	8.309	8.568	10.187	13.910	17.795	21.811	25.963	30.256
8	8.027	8.276	9.840	13.436	17.190	21.069	25.080	29.227
9	7.804	8.047	9.567	13.063	16.712	20.484	24.384	28.416
10	7.623	7.860	9.346	12.761	16.326	20.010	23.819	27.758
15	7.062	7.282	8.658	11.822	15.125	18.538	22.067	25.716
20	6.765	6.976	8.294	11.325	14.489	17.758	21.139	24.634
25	6.579	6.783	8.065	11.012	14.088	17.268	20.555	23.954
30	6.449	6.650	7.906	10.795	13.811	16.928	20.150	23.482
35	6.353	6.551	7.789	10.635	13.606	16.677	19.851	23.134
40	6.279	6.475	7.698	10.511	13.448	16.483	19.620	22.865
45	6.220	6.414	7.626	10.413	13.321	16.328	19.436	22.650
50	6.172	6.364	7.567	10.332	13.218	16.201	19.285	22.474
60	6.097	6.287	7.475	10.207	13.058	16.005	19.051	22.201
70	6.042	6.230	7.407	10.114	12.939	15.859	18.878	22.000
80	5.999	6.186	7.355	10.042	12.847	15.747	18.744	21.844
90	5.965	6.150	7.313	9.985	12.774	15.657	18.637	21.719
100	5.937	6.121	7.278	9.938	12.714	15.583	18.549	21.617

A = 1.35 Alpha = 0.34
B = -0.63 Beta = 1.031
C = 0.144 Gamma = 1.30

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3/

Basin : [11] Ivai
River : Ivai
Site : IV-3
C.A. = 19,992 km2

Duration[days]

TR [years]	7	15	30	60	90	120	150	1
2	40.921	44.532	57.960	90.113	126.675	167.360	212.145	261.(
3	31.423	34.196	44.507	69.197	97.273	128.514	162.905	200.4
4	27.283	29.692	38.645	60.082	84.459	111.585	141.446	174.(
5	24.919	27.118	35.295	54.875	77.139	101.914	129.186	158.9
6	23.375	25.438	33.108	51.474	72.359	95.599	121.181	149.1
7	22.281	24.248	31.560	49.067	68.975	91.128	115.514	142.1
8	21.464	23.358	30.402	47.267	66.444	87.785	111.276	136.9
9	20.828	22.666	29.501	45.866	64.475	85.183	107.977	132.8
10	20.318	22.111	28.778	44.743	62.896	83.097	105.333	129.6
15	18.771	20.428	26.587	41.337	58.108	76.771	97.315	119.7
20	17.979	19.566	25.466	39.593	55.657	73.532	93.209	114.6
25	17.493	19.037	24.778	38.523	54.153	71.545	90.690	111.5
30	17.163	18.678	24.310	37.795	53.130	70.193	88.977	109.4
35	16.922	18.416	23.969	37.266	52.386	69.210	87.731	107.9
40	16.739	18.217	23.710	36.863	51.819	68.462	86.782	106.7
45	16.595	18.060	23.505	36.544	51.371	67.871	86.033	105.8
50	16.478	17.932	23.339	36.286	51.009	67.392	85.426	105.1
60	16.299	17.738	23.086	35.893	50.456	66.661	84.499	103.9
70	16.169	17.596	22.902	35.606	50.053	66.128	83.824	103.1
80	16.069	17.488	22.761	35.387	49.745	65.721	83.308	102.9
90	15.991	17.402	22.649	35.214	49.501	65.400	82.901	102.(
100	15.927	17.333	22.559	35.073	49.304	65.139	82.570	101.6

A = 1.66 Alpha = 0.
B = -0.75 Beta = 1.(
C = 0.185 Gamma = 1.

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3

Basin : [12] Ivai
River : Ivai
Site : IV-4
C.A. = 29,206 km2

Duration[days]

TR [years]	7	15	30	60	90	120	150	
2	220.821	228.126	247.134	280.902	309.575	335.000	358.186	379.
3	193.988	200.405	217.103	246.768	271.957	294.292	314.661	333.
4	179.410	185.344	200.787	228.223	251.519	272.176	291.013	308.
5	169.751	175.366	189.977	215.936	237.978	257.522	275.346	291.
6	162.692	168.073	182.077	206.957	228.082	246.814	263.896	279.
7	157.216	162.417	175.950	199.992	220.406	238.507	255.015	270.
8	152.795	157.849	171.001	194.367	214.207	231.799	247.843	262.
9	149.119	154.051	166.887	189.691	209.053	226.222	241.879	256.
10	145.994	150.823	163.390	185.715	204.672	221.481	236.811	251.
15	135.232	139.706	151.346	172.026	189.586	205.156	219.355	232.
20	128.642	132.897	143.970	163.642	180.346	195.157	208.664	221.
25	124.036	128.139	138.815	157.783	173.889	188.170	201.194	213.
30	120.566	124.554	134.932	153.369	169.024	182.906	195.565	207.
35	117.821	121.718	131.860	149.877	165.176	178.741	191.112	202.
40	115.573	119.395	129.344	147.017	162.024	175.331	187.466	198.
45	113.684	117.445	127.230	144.615	159.377	172.466	184.403	195
50	112.066	115.773	125.419	142.557	157.108	170.011	181.778	192
60	109.416	113.036	122.454	139.186	153.393	165.991	177.480	188
70	107.316	110.865	120.103	136.514	150.448	162.804	174.073	184
80	105.593	109.086	118.175	134.322	148.033	160.191	171.278	181
90	104.144	107.589	116.553	132.479	146.002	157.993	168.928	179
100	102.901	106.305	115.163	130.899	144.260	156.108	166.912	176

A = 2.22 Alpha = 0
B = -0.19 Beta = 1
C = 0.050 Gamma = 2

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3/s

Basin : [13] Ivai
River : Ivai
Site : IV-5
C.A. = 35,879 km2

TR ears] \ Duration[days]	7	15	30	60	90	120	150	180
2	200.734	203.962	225.242	269.652	311.009	349.956	387.185	423.143
3	177.884	180.745	199.603	238.958	275.606	310.121	343.111	374.977
4	164.905	167.557	185.039	221.523	255.498	287.494	318.077	347.618
5	156.044	158.554	175.096	209.619	241.768	272.045	300.985	328.939
6	149.418	151.821	167.661	200.719	231.503	260.494	288.205	314.971
7	144.183	146.501	161.787	193.686	223.391	251.366	278.107	303.935
8	139.888	142.138	156.968	187.917	216.737	243.879	269.823	294.882
9	136.269	138.461	152.907	183.055	211.130	237.570	262.842	287.253
10	133.156	135.297	149.414	178.873	206.307	232.143	256.838	280.691
15	122.150	124.114	137.064	164.088	189.254	212.955	235.609	257.490
20	115.160	117.012	129.220	154.698	178.424	200.768	222.126	242.755
25	110.145	111.916	123.593	147.961	170.654	192.025	212.453	232.184
30	106.287	107.997	119.264	142.779	164.677	185.300	205.012	224.052
35	103.182	104.842	115.780	138.609	159.867	179.887	199.023	217.507
40	100.603	102.220	112.886	135.143	155.870	175.389	194.047	212.069
45	98.408	99.990	110.422	132.194	152.469	171.562	189.813	207.442
50	96.505	98.057	108.288	129.639	149.522	168.246	186.144	203.432
60	93.345	94.846	104.742	125.393	144.625	162.736	180.048	196.770
70	90.796	92.257	101.882	121.970	140.676	158.293	175.133	191.397
80	88.676	90.102	99.502	119.121	137.391	154.596	171.042	186.927
90	86.870	88.267	97.476	116.695	134.592	151.447	167.558	183.120
100	85.303	86.675	95.718	114.591	132.165	148.716	164.537	179.817

A = 2.10 Alpha = 0.16
B = -0.37 Beta = 1.114
C = 0.084 Gamma = 3.70

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3/s

Basin : [14] Litoranea
River : Litoranea
Site : LT-1
C.A. = 5,766 km2

TR ears] \ Duration[days]	7	15	30	60	90	120	150	180
2	58.455	62.900	70.004	80.963	89.737	97.306	104.088	110.304
3	51.038	54.919	61.121	70.690	78.350	84.959	90.880	96.308
4	47.382	50.985	56.743	65.626	72.738	78.873	84.370	89.408
5	45.113	48.543	54.026	62.483	69.255	75.096	80.330	85.127
6	43.536	46.846	52.137	60.298	66.833	72.470	77.521	82.151
7	42.361	45.582	50.729	58.671	65.029	70.514	75.429	79.933
8	41.443	44.595	49.631	57.400	63.621	68.987	73.796	78.203
9	40.703	43.798	48.744	56.375	62.484	67.755	72.477	76.805
10	40.089	43.138	48.009	55.525	61.543	66.734	71.385	75.648
15	38.094	40.990	45.619	52.761	58.479	63.411	67.831	71.882
20	36.964	39.775	44.267	51.197	56.745	61.532	65.820	69.751
25	36.219	38.973	43.375	50.165	55.601	60.291	64.493	68.345
30	35.683	38.396	42.732	49.422	54.778	59.398	63.538	67.332
35	35.274	37.956	42.243	48.856	54.150	58.718	62.810	66.561
40	34.950	37.607	41.854	48.406	53.652	58.178	62.232	65.949
45	34.685	37.322	41.537	48.039	53.246	57.737	61.761	65.449
50	34.463	37.084	41.272	47.733	52.905	57.368	61.366	65.031
60	34.112	36.705	40.851	47.246	52.366	56.783	60.740	64.368
70	33.843	36.416	40.529	46.874	51.954	56.336	60.262	63.861
80	33.630	36.187	40.274	46.578	51.626	55.981	59.882	63.458
90	33.455	35.999	40.064	46.336	51.358	55.690	59.571	63.129
100	33.309	35.842	39.889	46.134	51.134	55.447	59.311	62.853

A = 2.40 Alpha = 0.50
B = -0.09 Beta = 1.048
C = 0.040 Gamma = 1.70

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3

Basin : [15] Parana-1
River : Parana-1
Site : PA-1
C.A. = 1,332 km2

TR [years]	Duration [days] 7	15	30	60	90	120	150	
2	14.051	18.165	24.897	36.887	48.130	59.075	69.894	80.
3	12.399	16.029	21.971	32.551	42.472	52.131	61.678	71.
4	11.449	14.802	20.288	30.059	39.220	48.139	56.955	65.
5	10.796	13.957	19.130	28.343	36.981	45.391	53.704	61.
6	10.304	13.322	18.259	27.052	35.297	43.324	51.259	59.
7	9.914	12.817	17.567	26.027	33.960	41.683	49.316	56.
8	9.592	12.401	16.997	25.183	32.858	40.330	47.716	55.
9	9.320	12.049	16.515	24.469	31.926	39.187	46.363	53.
10	9.085	11.746	16.099	23.852	31.122	38.200	45.196	52.
15	8.250	10.665	14.618	21.658	28.259	34.686	41.038	47.
20	7.714	9.972	13.668	20.251	26.423	32.432	38.372	44.
25	7.326	9.472	12.982	19.234	25.096	30.803	36.445	42.
30	7.027	9.084	12.451	18.448	24.070	29.544	34.955	40.
35	6.784	8.771	12.022	17.812	23.240	28.525	33.749	38.
40	6.582	8.510	11.664	17.281	22.548	27.676	32.744	37.
45	6.410	8.287	11.358	16.828	21.957	26.950	31.886	36.
50	6.260	8.093	11.092	16.434	21.443	26.320	31.140	35.
60	6.010	7.769	10.649	15.778	20.586	25.268	29.896	34.
70	5.807	7.508	10.290	15.246	19.892	24.416	28.888	33.
80	5.638	7.289	9.990	14.801	19.312	23.704	28.045	32.
90	5.493	7.102	9.734	14.421	18.817	23.096	27.326	31.
100	5.367	6.939	9.511	14.091	18.386	22.567	26.700	30.

A = 2.10 Alpha = 0.
B = -0.04 Beta = 1.
C = 0.081 Gamma = 4.

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m

Basin : [16] Parana-2
River : Parana-2
Site : PA-2
C.A. = 3,157 km2

TR [years]	Duration [days] 7	15	30	60	90	120	150	
2	16.855	17.038	18.823	22.652	26.263	29.692	32.990	36
3	14.785	14.945	16.511	19.869	23.037	26.045	28.938	31
4	13.623	13.771	15.214	18.308	21.227	23.998	26.664	29
5	12.836	12.976	14.335	17.251	20.001	22.613	25.124	27
6	12.251	12.385	13.682	16.465	19.090	21.583	23.980	26
7	11.792	11.920	13.169	15.847	18.374	20.773	23.080	25
8	11.416	11.541	12.750	15.343	17.789	20.112	22.346	24
9	11.101	11.222	12.398	14.919	17.298	19.557	21.729	23
10	10.831	10.949	12.096	14.556	16.877	19.080	21.200	23
15	9.882	9.990	11.037	13.281	15.399	17.409	19.343	21
20	9.286	9.387	10.370	12.480	14.469	16.359	18.176	19
25	8.861	8.958	9.896	11.909	13.807	15.610	17.344	19
30	8.536	8.629	9.533	11.472	13.301	15.038	16.708	18
35	8.276	8.366	9.242	11.122	12.895	14.579	16.198	17
40	8.060	8.148	9.002	10.832	12.560	14.199	15.777	17
45	7.878	7.963	8.798	10.587	12.275	13.878	15.419	16
50	7.720	7.804	8.621	10.375	12.029	13.600	15.110	16
60	7.459	7.540	8.330	10.024	11.622	13.140	14.599	16
70	7.249	7.328	8.095	9.742	11.295	12.770	14.189	15
80	7.075	7.152	7.901	9.509	11.025	12.464	13.849	15
90	6.928	7.003	7.737	9.310	10.795	12.204	13.560	14
100	6.800	6.874	7.594	9.139	10.596	11.980	13.310	14

A = 2.10 Alpha = 0
B = -0.40 Beta = 1
C = 0.089 Gamma = 3

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3/s

Basin : [17] Parana-3
River : Parana-3
Site : PA-3
C.A. = 8,668 km2

Duration[days]

TR years]	7	15	30	60	90	120	150	180
2	45.923	49.308	58.540	76.951	94.666	111.999	129.152	146.241
3	36.379	39.061	46.374	60.959	74.992	88.723	102.311	115.849
4	31.485	33.806	40.135	52.758	64.904	76.787	88.547	100.264
5	28.367	30.458	36.160	47.532	58.475	69.181	79.777	90.333
6	26.154	28.082	33.339	43.825	53.914	63.786	73.554	83.287
7	24.479	26.283	31.204	41.018	50.460	59.699	68.843	77.952
8	23.153	24.860	29.514	38.796	47.727	56.466	65.114	73.729
9	22.070	23.696	28.133	36.981	45.494	53.824	62.067	70.280
10	21.163	22.723	26.977	35.461	43.625	51.612	59.517	67.392
15	18.144	19.482	23.129	30.403	37.402	44.250	51.027	57.779
20	16.380	17.588	20.880	27.448	33.766	39.949	46.067	52.162
25	15.189	16.309	19.362	25.452	31.311	37.044	42.717	48.369
30	14.316	15.371	18.249	23.988	29.510	34.913	40.261	45.588
35	13.640	14.645	17.387	22.855	28.117	33.265	38.360	43.435
40	13.097	14.062	16.695	21.945	26.997	31.940	36.832	41.706
45	12.648	13.580	16.123	21.193	26.072	30.846	35.570	40.277
50	12.269	13.173	15.640	20.558	25.291	29.922	34.505	39.070
60	11.660	12.519	14.863	19.538	24.036	28.437	32.792	37.131
70	11.188	12.012	14.261	18.747	23.062	27.285	31.464	35.627
80	10.808	11.604	13.777	18.110	22.279	26.358	30.395	34.416
90	10.493	11.267	13.376	17.583	21.630	25.591	29.510	33.415
100	10.227	10.981	13.037	17.137	21.082	24.943	28.763	32.569

A = 2.10 Alpha = 0.11
B = -0.40 Beta = 1.114
C = 0.106 Gamma = 2.00

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3/s

Basin : [18] Parana Panema-1
River : Parana Panema-1
Site : PP-1
C.A. = 1,246 km2

Duration[days]

TR years]	7	15	30	60	90	120	150	180
2	3.949	4.104	4.498	5.201	5.806	6.348	6.846	7.313
3	3.369	3.502	3.837	4.438	4.954	5.416	5.841	6.239
4	3.099	3.220	3.529	4.082	4.556	4.981	5.372	5.738
5	2.937	3.052	3.345	3.868	4.318	4.721	5.092	5.438
6	2.827	2.938	3.220	3.724	4.157	4.545	4.902	5.236
7	2.747	2.856	3.129	3.619	4.040	4.417	4.764	5.088
8	2.686	2.792	3.060	3.539	3.950	4.319	4.658	4.975
9	2.638	2.742	3.005	3.475	3.879	4.241	4.574	4.885
10	2.598	2.700	2.959	3.423	3.820	4.177	4.505	4.812
15	2.473	2.571	2.817	3.258	3.637	3.976	4.288	4.580
20	2.406	2.500	2.740	3.169	3.537	3.867	4.171	4.455
25	2.362	2.455	2.691	3.112	3.474	3.798	4.096	4.375
30	2.332	2.424	2.656	3.072	3.429	3.749	4.043	4.319
35	2.309	2.400	2.631	3.042	3.396	3.713	4.004	4.277
40	2.292	2.382	2.610	3.019	3.370	3.684	3.974	4.244
45	2.278	2.367	2.594	3.000	3.349	3.662	3.949	4.218
50	2.266	2.355	2.581	2.985	3.332	3.643	3.929	4.196
60	2.248	2.336	2.560	2.961	3.305	3.613	3.897	4.162
70	2.234	2.322	2.545	2.943	3.285	3.591	3.873	4.137
80	2.223	2.311	2.532	2.929	3.269	3.574	3.855	4.117
90	2.215	2.302	2.523	2.917	3.257	3.560	3.840	4.101
100	2.208	2.294	2.515	2.908	3.246	3.549	3.828	4.088

A = 1.44 Alpha = 0.49
B = -0.21 Beta = 1.040
C = 0.056 Gamma = 1.41

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3/

Basin : [19] Parana Panema-2
River : Parana Panema-2
Site : PP-2
C.A. = 695 km2

Duration(days)

TR (years)	7	15	30	60	90	120	150	1
2	1.486	1.485	1.625	1.939	2.237	2.522	2.796	3.(
3	1.138	1.137	1.244	1.484	1.713	1.930	2.140	2.3
4	0.979	0.979	1.071	1.277	1.474	1.662	1.842	2.(
5	0.886	0.886	0.969	1.156	1.334	1.504	1.667	1.8
6	0.824	0.824	0.901	1.075	1.241	1.398	1.550	1.8
7	0.780	0.779	0.852	1.017	1.173	1.323	1.466	1.6
8	0.746	0.745	0.815	0.973	1.122	1.265	1.402	1.5
9	0.719	0.718	0.786	0.938	1.082	1.220	1.352	1.4
10	0.697	0.697	0.762	0.909	1.050	1.183	1.311	1.4
15	0.630	0.629	0.689	0.822	0.948	1.069	1.185	1.2
20	0.594	0.594	0.650	0.775	0.895	1.008	1.118	1.2
25	0.572	0.571	0.625	0.746	0.861	0.970	1.076	1.1
30	0.556	0.556	0.608	0.726	0.837	0.944	1.046	1.1
35	0.545	0.544	0.596	0.711	0.820	0.924	1.025	1.1
40	0.536	0.536	0.586	0.699	0.807	0.909	1.008	1.1
45	0.529	0.528	0.578	0.690	0.796	0.897	0.995	1.(
50	0.523	0.523	0.572	0.682	0.787	0.887	0.984	1.(
60	0.514	0.514	0.562	0.671	0.774	0.872	0.967	1.(
70	0.508	0.507	0.555	0.662	0.764	0.861	0.954	1.(
80	0.502	0.502	0.549	0.655	0.756	0.852	0.945	1.(
90	0.498	0.498	0.545	0.650	0.750	0.845	0.937	1.(
100	0.495	0.494	0.541	0.645	0.745	0.840	0.931	1.(

A = 1.40 Alpha = 0.
B = -0.42 Beta = 1.(
C = 0.090 Gamma = 1.

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3/

Basin : [20] Parana Panema-3
River : Parana Panema-3
Site : PP-3
C.A. = 3,712 km2

Duration(days)

TR (years)	7	15	30	60	90	120	150	1
2	17.739	18.084	19.493	22.194	24.561	26.693	28.659	30.5
3	13.975	14.246	15.356	17.484	19.349	21.028	22.577	24.(
4	12.105	12.340	13.302	15.145	16.760	18.215	19.557	20.8
5	10.939	11.152	12.020	13.686	15.145	16.460	17.673	18.8
6	10.125	10.322	11.126	12.668	14.019	15.236	16.358	17.4
7	9.517	9.702	10.458	11.907	13.177	14.320	15.375	16.3
8	9.041	9.217	9.935	11.312	12.518	13.604	14.606	15.5
9	8.656	8.824	9.511	10.830	11.984	13.025	13.984	14.8
10	8.336	8.498	9.160	10.430	11.542	12.544	13.468	14.3
15	7.291	7.433	8.012	9.123	10.095	10.972	11.780	12.5
20	6.697	6.827	7.359	8.379	9.272	10.077	10.819	11.5
25	6.303	6.425	6.926	7.886	8.726	9.484	10.182	10.8
30	6.018	6.135	6.613	7.529	8.332	9.055	9.722	10.3
35	5.800	5.913	6.374	7.257	8.031	8.728	9.371	9.9
40	5.627	5.737	6.183	7.040	7.791	8.467	9.091	9.(
45	5.485	5.592	6.028	6.863	7.595	8.254	8.862	9.4
50	5.367	5.471	5.897	6.715	7.431	8.076	8.670	9.2
60	5.178	5.279	5.690	6.478	7.169	7.791	8.365	8.9
70	5.033	5.131	5.531	6.297	6.969	7.574	8.132	8.(
80	4.918	5.014	5.404	6.153	6.809	7.400	7.946	8.4
90	4.824	4.917	5.300	6.035	6.678	7.258	7.793	8.3
100	4.744	4.837	5.213	5.936	6.569	7.139	7.665	8.2

A = 1.90 Alpha = 0.
B = -0.24 Beta = 1.(
C = 0.057 Gamma = 1.

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3/s

Basin : [21] Parana Panema-4
River : Parana Panema-4
Site : PP-4
C.A. = 4,144 km2

TR ears] \ Duration[days]	7	15	30	60	90	120	150	180
2	22.425	21.705	22.521	24.897	27.189	29.325	31.332	33.236
3	19.511	18.884	19.594	21.661	23.655	25.514	27.261	28.916
4	17.820	17.248	17.896	19.784	21.605	23.303	24.898	26.410
5	16.649	16.114	16.720	18.484	20.185	21.772	23.262	24.675
6	15.763	15.257	15.830	17.501	19.112	20.614	22.024	23.362
7	15.058	14.574	15.121	16.717	18.256	19.691	21.038	22.316
8	14.474	14.009	14.536	16.069	17.549	18.928	20.223	21.451
9	13.979	13.530	14.039	15.520	16.949	18.281	19.532	20.718
10	13.551	13.116	13.609	15.045	16.430	17.721	18.934	20.084
15	12.019	11.632	12.070	13.343	14.571	15.716	16.792	17.812
20	11.028	10.674	11.075	12.243	13.370	14.421	15.408	16.344
25	10.308	9.977	10.352	11.444	12.498	13.480	14.403	15.278
30	9.749	9.436	9.791	10.824	11.820	12.749	13.621	14.449
35	9.295	8.997	9.335	10.320	11.270	12.156	12.987	13.776
40	8.916	8.629	8.954	9.898	10.810	11.659	12.457	13.214
45	8.591	8.315	8.627	9.537	10.415	11.234	12.003	12.732
50	8.308	8.041	8.343	9.223	10.072	10.864	11.607	12.312
60	7.834	7.582	7.867	8.697	9.498	10.244	10.945	11.610
70	7.448	7.209	7.480	8.269	9.031	9.740	10.407	11.039
80	7.126	6.897	7.156	7.911	8.639	9.318	9.956	10.561
90	6.849	6.629	6.878	7.604	8.304	8.956	9.569	10.151
100	6.608	6.396	6.636	7.336	8.012	8.641	9.233	9.793

A = 2.10 Alpha = -0.16
B = -0.35 Beta = 1.120
C = 0.066 Gamma = 4.50

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3/s

Basin : [22] Piguiri
River : Piguiri
Site : PQ-1
C.A. = 8,745 km2

TR ears] \ Duration[days]	7	15	30	60	90	120	150	180
2	55.633	54.201	56.803	63.672	70.225	76.337	82.095	87.572
3	45.330	44.163	46.283	51.879	57.218	62.199	66.890	71.353
4	40.141	39.107	40.985	45.941	50.669	55.079	59.233	63.185
5	36.874	35.925	37.650	42.202	46.546	50.597	54.413	58.044
6	34.578	33.688	35.305	39.575	43.647	47.447	51.025	54.430
7	32.853	32.007	33.544	37.600	41.469	45.079	48.479	51.713
8	31.496	30.685	32.158	36.047	39.757	43.217	46.477	49.577
9	30.393	29.611	31.032	34.785	38.365	41.704	44.849	47.842
10	29.475	28.716	30.094	33.734	37.205	40.444	43.494	46.396
15	26.449	25.768	27.005	30.271	33.386	36.292	39.029	41.633
20	24.707	24.071	25.226	28.277	31.187	33.902	36.459	38.891
25	23.543	22.937	24.038	26.945	29.718	32.304	34.741	37.059
30	22.697	22.112	23.174	25.976	28.649	31.143	33.492	35.727
35	22.046	21.479	22.510	25.232	27.828	30.251	32.532	34.703
40	21.527	20.973	21.979	24.637	27.173	29.538	31.766	33.885
45	21.100	20.556	21.543	24.148	26.634	28.952	31.136	33.213
50	20.741	20.207	21.177	23.738	26.181	28.459	30.606	32.648
60	20.167	19.648	20.591	23.081	25.457	27.672	29.760	31.745
70	19.726	19.218	20.140	22.576	24.899	27.066	29.108	31.050
80	19.372	18.873	19.779	22.171	24.453	26.581	28.586	30.493
90	19.081	18.590	19.482	21.838	24.086	26.182	28.157	30.036
100	18.836	18.352	19.232	21.558	23.777	25.846	27.796	29.650

A = 2.34 Alpha = 0.25
B = -0.36 Beta = 1.100
C = 0.070 Gamma = 1.85

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3/

Basin : [23] Piguiri
River : Piguiri
Site : PQ-2
C.A. = 18,969 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	1
2	172.121	186.966	214.585	261.402	301.606	337.981	371.809	403.7
3	146.046	158.641	182.076	221.801	255.914	286.779	315.482	342.6
4	133.232	144.723	166.101	202.341	233.461	261.618	287.803	312.5
5	125.298	136.104	156.209	190.291	219.558	246.037	270.663	293.8
6	119.790	130.121	149.343	181.926	209.907	235.223	258.766	281.0
7	115.692	125.670	144.235	175.703	202.727	227.177	249.915	271.4
8	112.498	122.200	140.252	170.851	197.129	220.903	243.013	263.9
9	109.921	119.401	137.039	166.937	192.613	215.843	237.446	257.8
10	107.788	117.084	134.380	163.698	188.875	211.655	232.839	252.8
15	100.861	109.560	125.744	153.178	176.738	198.053	217.876	236.6
20	96.952	105.313	120.870	147.241	169.887	190.376	209.431	227.4
25	94.377	102.517	117.660	143.331	165.376	185.321	203.870	221.4
30	92.526	100.506	115.353	140.520	162.132	181.686	199.871	217.0
35	91.117	98.975	113.596	138.380	159.663	178.919	196.827	213.7
40	90.000	97.762	112.204	136.684	157.707	176.727	194.415	211.1
45	89.089	96.772	111.068	135.300	156.110	174.937	192.446	209.0
50	88.328	95.945	110.119	134.144	154.776	173.442	190.802	207.2
60	87.121	94.634	108.614	132.311	152.661	171.072	188.194	204.3
70	86.200	93.634	107.466	130.912	151.047	169.264	186.205	202.2
80	85.468	92.840	106.554	129.802	149.766	167.828	184.626	200.5
90	84.871	92.191	105.809	128.894	148.719	166.655	183.335	199.1
100	84.371	91.648	105.186	128.135	147.843	165.673	182.255	197.9

A = 2.38 Alpha = 0.4
B = -0.18 Beta = 1.6
C = 0.062 Gamma = 1.8

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3

Basin : [24] Piguiri
River : Piguiri
Site : PQ-3
C.A. = 24,708 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	
2	139.698	145.589	165.362	204.589	241.090	275.722	309.096	341.
3	120.974	126.076	143.198	177.168	208.776	238.767	267.667	295.
4	110.741	115.411	131.086	162.182	191.116	218.570	245.026	270.
5	103.934	108.318	123.028	152.213	179.369	205.135	229.965	254.
6	98.945	103.118	117.122	144.906	170.758	195.288	218.925	241.
7	95.065	99.074	112.530	139.224	164.063	187.630	210.341	232.
8	91.926	95.802	108.814	134.626	158.645	181.434	203.395	224.
9	89.311	93.077	105.718	130.797	154.132	176.273	197.609	218.
10	87.084	90.757	103.083	127.536	150.290	171.879	192.683	212.
15	79.391	82.740	93.976	116.270	137.013	156.695	175.661	194.
20	74.657	77.805	88.372	109.336	128.842	147.350	165.186	182.
25	71.337	74.345	84.442	104.474	123.113	140.798	157.840	174.
30	68.829	71.731	81.473	100.800	118.784	135.847	152.290	168.
35	66.840	69.659	79.119	97.888	115.352	131.922	147.890	163.
40	65.208	67.958	77.188	95.498	112.536	128.701	144.279	159.
45	63.835	66.527	75.562	93.487	110.166	125.991	141.241	156.
50	62.657	65.299	74.168	91.762	108.133	123.666	138.634	153.
60	60.723	63.284	71.879	88.930	104.796	119.850	134.357	148.
70	59.187	61.684	70.061	86.681	102.145	116.818	130.958	144.
80	57.925	60.368	68.567	84.832	99.967	114.327	128.165	141.
90	56.862	59.260	67.308	83.275	98.132	112.229	125.813	139.
100	55.949	58.308	66.227	81.938	96.556	110.426	123.792	136.

A = 2.10 Alpha = 0.2
B = -0.36 Beta = 1.1
C = 0.089 Gamma = 2.6

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [25] Pirapo
River : Pirapo
Site : PR-1
C.A. = 5,006 km2

TR	Duration[days]							
years]	7	15	30	60	90	120	150	180
2	29.065	28.930	30.636	34.401	37.829	40.961	43.872	46.614
3	25.321	25.204	26.690	29.970	32.956	35.685	38.221	40.609
4	23.149	23.041	24.400	27.399	30.129	32.624	34.942	37.125
5	21.644	21.544	22.814	25.618	28.171	30.503	32.671	34.712
6	20.507	20.412	21.615	24.272	26.690	28.900	30.954	32.888
7	19.600	19.509	20.659	23.198	25.510	27.622	29.585	31.434
8	18.850	18.763	19.869	22.311	24.534	26.566	28.454	30.232
9	18.215	18.130	19.199	21.559	23.707	25.670	27.494	29.212
10	17.665	17.583	18.620	20.908	22.991	24.895	26.664	28.330
15	15.696	15.623	16.544	18.577	20.428	22.120	23.692	25.172
20	14.423	14.356	15.203	17.071	18.772	20.327	21.771	23.131
25	13.499	13.436	14.228	15.977	17.569	19.024	20.376	21.649
30	12.780	12.721	13.471	15.127	16.634	18.011	19.291	20.497
35	12.197	12.141	12.857	14.437	15.875	17.190	18.411	19.562
40	11.710	11.655	12.343	13.860	15.240	16.502	17.675	18.780
45	11.292	11.240	11.903	13.365	14.697	15.914	17.045	18.110
50	10.928	10.878	11.519	12.935	14.223	15.401	16.496	17.526
60	10.320	10.272	10.877	12.214	13.431	14.543	15.577	16.550
70	9.825	9.779	10.356	11.629	12.787	13.846	14.830	15.757
80	9.410	9.366	9.919	11.138	12.247	13.262	14.204	15.092
90	9.055	9.013	9.544	10.717	11.785	12.761	13.668	14.522
100	8.745	8.704	9.218	10.350	11.382	12.324	13.200	14.025

A = 2.07 Alpha = -0.15
B = -0.29 Beta = 1.122
C = 0.061 Gamma = 4.50

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [26] Ribeira
River : Ribeira
Site : RB-1
C.A. = 4,016 km2

TR	Duration[days]							
[years]	7	15	30	60	90	120	150	180
2	27.122	26.908	27.536	29.002	30.298	31.440	32.467	33.404
3	24.603	24.409	24.979	26.309	27.485	28.521	29.452	30.302
4	23.263	23.079	23.618	24.876	25.988	26.967	27.848	28.652
5	22.387	22.211	22.729	23.940	25.009	25.952	26.799	27.573
6	21.754	21.582	22.086	23.262	24.302	25.218	26.041	26.793
7	21.267	21.099	21.592	22.742	23.758	24.653	25.458	26.193
8	20.876	20.712	21.195	22.324	23.322	24.201	24.991	25.712
9	20.554	20.392	20.868	21.979	22.961	23.827	24.604	25.315
10	20.281	20.121	20.591	21.687	22.657	23.511	24.278	24.979
15	19.353	19.201	19.649	20.695	21.620	22.435	23.167	23.836
20	18.794	18.646	19.081	20.098	20.996	21.787	22.498	23.148
25	18.408	18.263	18.690	19.685	20.565	21.340	22.036	22.673
30	18.121	17.978	18.397	19.377	20.243	21.006	21.692	22.318
35	17.895	17.754	18.168	19.136	19.991	20.744	21.421	22.040
40	17.711	17.571	17.981	18.939	19.785	20.531	21.201	21.813
45	17.557	17.419	17.826	18.775	19.614	20.353	21.018	21.624
50	17.427	17.289	17.693	18.635	19.468	20.202	20.861	21.463
60	17.214	17.078	17.477	18.408	19.230	19.955	20.606	21.201
70	17.046	16.912	17.307	18.229	19.043	19.761	20.406	20.995
80	16.910	16.777	17.168	18.083	18.891	19.603	20.243	20.827
90	16.796	16.664	17.053	17.961	18.763	19.471	20.106	20.687
100	16.699	16.567	16.954	17.857	18.655	19.358	19.990	20.567

A = 2.10 Alpha = 0.53
B = -0.15 Beta = 1.064
C = 0.030 Gamma = 2.40

Probability Drought Discharge [Return Period ' Duration Time] Unit:m

Basin : [27] Ribeira
River : Ribeira
Site : RB-2
C.A. = 9,129 km2

Duration(days)

TR (years)	7	15	30	60	90	120	150	
2	66.917	69.323	73.415	79.638	84.456	88.489	92.012	95
3	60.567	62.745	66.448	72.081	76.441	80.092	83.281	86
4	57.557	59.627	63.146	68.499	72.642	76.112	79.142	81
5	55.738	57.742	61.150	66.334	70.347	73.706	76.641	79
6	54.498	56.458	59.790	64.859	68.782	72.067	74.936	77
7	53.590	55.517	58.793	63.777	67.635	70.866	73.687	76
8	52.890	54.792	58.026	62.945	66.752	69.941	72.725	75
9	52.332	54.214	57.413	62.280	66.048	69.202	71.958	74
10	51.874	53.740	56.911	61.736	65.470	68.597	71.328	73
15	50.419	52.232	55.314	60.003	63.633	66.672	69.327	71
20	49.621	51.405	54.439	59.054	62.626	65.617	68.230	70
25	49.107	50.872	53.875	58.442	61.977	64.937	67.523	69
30	48.743	50.496	53.476	58.009	61.518	64.456	67.023	69
35	48.470	50.213	53.176	57.684	61.174	64.095	66.647	68
40	48.256	49.991	52.942	57.430	60.904	63.813	66.353	68
45	48.084	49.812	52.752	57.224	60.686	63.584	66.116	68
50	47.941	49.664	52.595	57.054	60.505	63.395	65.919	68
60	47.716	49.432	52.350	56.787	60.222	63.099	65.611	67
70	47.548	49.257	52.165	56.587	60.010	62.876	65.379	67
80	47.415	49.120	52.019	56.429	59.843	62.701	65.197	67
90	47.308	49.009	51.902	56.302	59.707	62.559	65.050	67
100	47.220	48.917	51.805	56.196	59.595	62.442	64.928	67

A = 2.09 Alpha = (
B = -0.07 Beta = 1
C = 0.025 Gamma = 1

Probability Drought Discharge [Return Period ' Duration Time] Unit:r

Basin : [28] Tibagi
River : Tibagi
Site : TB-1
C.A. = 5,148 km2

Duration(days)

TR (years)	7	15	30	60	90	120	150	
2	17.008	17.971	20.483	25.211	29.501	33.511	37.331	4
3	13.717	14.495	16.521	20.334	23.794	27.028	30.109	3
4	12.050	12.733	14.512	17.862	20.901	23.742	26.449	2
5	10.996	11.619	13.243	16.300	19.073	21.665	24.135	2
6	10.252	10.833	12.347	15.198	17.783	20.200	22.503	2
7	9.692	10.241	11.673	14.367	16.812	19.097	21.274	2
8	9.250	9.775	11.141	13.713	16.046	18.227	20.305	2
9	8.891	9.395	10.708	13.180	15.422	17.518	19.516	2
10	8.591	9.078	10.347	12.735	14.902	16.927	18.857	2
15	7.599	8.030	9.152	11.265	13.182	14.973	16.681	1
20	7.025	7.424	8.461	10.414	12.186	13.843	15.421	1
25	6.641	7.017	7.998	9.844	11.519	13.084	14.576	1
30	6.360	6.720	7.659	9.428	11.032	12.531	13.960	1
35	6.144	6.492	7.399	9.107	10.657	12.105	13.485	1
40	5.970	6.309	7.191	8.850	10.356	11.764	13.105	1
45	5.828	6.158	7.019	8.639	10.109	11.483	12.792	1
50	5.708	6.031	6.874	8.461	9.901	11.247	12.529	1
60	5.516	5.828	6.643	8.176	9.568	10.868	12.107	1
70	5.367	5.672	6.464	7.957	9.310	10.576	11.782	1
80	5.249	5.546	6.321	7.780	9.104	10.341	11.520	1
90	5.150	5.442	6.203	7.635	8.934	10.148	11.305	1
100	5.068	5.355	6.103	7.512	8.791	9.985	11.124	1

A = 1.54 Alpha =
B = -0.30 Beta =
C = 0.080 Gamma =

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3/s

Basin : [29] Tibagi
River : Tibagi
Site : TB-2
C.A. = 16,475 km2

TR [years] \ Duration[days]	7	15	30	60	90	120	150	180
2	46.656	55.175	71.159	101.126	129.924	158.362	186.778	215.343
3	37.268	44.072	56.840	80.778	103.781	126.496	149.195	172.012
4	33.024	39.054	50.368	71.580	91.964	112.093	132.207	152.426
5	30.540	36.116	46.579	66.196	85.046	103.661	122.262	140.960
6	28.888	34.162	44.059	62.614	80.445	98.053	115.647	133.334
7	27.700	32.758	42.248	60.040	77.138	94.022	110.893	127.853
8	26.801	31.694	40.876	58.091	74.633	90.969	107.292	123.701
9	26.093	30.858	39.797	56.557	72.663	88.567	104.460	120.435
10	25.520	30.180	38.923	55.315	71.068	86.623	102.166	117.791
15	23.747	28.083	36.219	51.472	66.130	80.604	95.068	109.607
20	22.812	26.977	34.793	49.445	63.526	77.430	91.325	105.291
25	22.226	26.284	33.899	48.175	61.894	75.441	88.978	102.586
30	21.820	25.805	33.280	47.296	60.764	74.064	87.355	100.714
35	21.521	25.451	32.824	46.648	59.932	73.050	86.158	99.334
40	21.291	25.179	32.473	46.148	59.290	72.267	85.235	98.270
45	21.107	24.961	32.192	45.750	58.778	71.643	84.499	97.422
50	20.957	24.783	31.963	45.424	58.360	71.133	83.897	96.728
60	20.725	24.509	31.609	44.921	57.714	70.346	82.969	95.658
70	20.553	24.306	31.348	44.550	57.236	69.764	82.282	94.866
80	20.421	24.150	31.146	44.262	56.867	69.314	81.751	94.254
90	20.315	24.024	30.984	44.033	56.572	68.955	81.328	93.766
100	20.228	23.922	30.852	43.845	56.331	68.661	80.981	93.366

A = 1.28 Alpha = 0.36
B = -0.25 Beta = 1.044
C = 0.101 Gamma = 1.28

Probability Drought Discharge [Return Period ' Duration Time] Unit:m3/s

Basin : [30] Tibagi
River : Tibagi
Site : TB-3
C.A. = 24,635 km2

TR [years] \ Duration[days]	7	15	30	60	90	120	150	180
2	67.294	66.193	70.474	80.794	90.572	99.738	108.430	116.754
3	52.943	52.077	55.445	63.564	71.256	78.468	85.306	91.855
4	46.212	45.456	48.396	55.483	62.198	68.493	74.462	80.178
5	42.174	41.484	44.167	50.634	56.762	62.507	67.954	73.171
6	39.436	38.791	41.300	47.348	53.078	58.450	63.543	68.421
7	37.439	36.826	39.208	44.949	50.389	55.489	60.325	64.955
8	35.906	35.319	37.603	43.109	48.326	53.217	57.855	62.297
9	34.687	34.120	36.326	41.646	46.686	51.411	55.891	60.182
10	33.691	33.140	35.283	40.450	45.345	49.934	54.286	58.453
15	30.541	30.041	31.984	36.667	41.105	45.265	49.210	52.988
20	28.829	28.357	30.191	34.612	38.801	42.728	46.452	50.018
25	27.732	27.279	29.043	33.296	37.325	41.103	44.685	48.115
30	26.961	26.520	28.235	32.369	36.287	39.959	43.442	46.777
35	26.384	25.952	27.631	31.677	35.510	39.104	42.512	45.775
40	25.934	25.509	27.159	31.136	34.904	38.437	41.786	44.994
45	25.571	25.152	26.779	30.701	34.416	37.899	41.202	44.365
50	25.271	24.858	26.466	30.341	34.013	37.455	40.720	43.845
60	24.804	24.398	25.976	29.780	33.384	36.762	39.966	43.034
70	24.453	24.053	25.609	29.359	32.912	36.243	39.401	42.426
80	24.179	23.783	25.322	29.030	32.543	35.836	38.959	41.950
90	23.958	23.566	25.090	28.764	32.245	35.509	38.603	41.567
100	23.775	23.386	24.899	28.545	31.999	35.238	38.309	41.250

A = 1.58 Alpha = 0.28
B = -0.38 Beta = 1.056
C = 0.077 Gamma = 1.43

II. DATA FOR SECTORAL REPORT VOL. G, WATER UTILIZATION PLAN

II-1 Drought Discharge (Return Period 10 years)

Drought Discharge [Return Period(10years)～ Duration Time(7days)] Unit:m3/s

No.	Basin	River	Site Name		Area [km2]	Q10.7 [m3/s]	Q10.7 [m3/s/100km2]
[1]	Cascavel	Rio Andradas (	Sao Sebastiao	[65979	1,309	2.403	0.184
[2]	Ponta Grossa	Rio Pitangui (	Sumidouro	[64450	523	0.458	0.088
[3]	Londrina	Rio Tibagi	Apertados	[64504	290	0.216	0.075
[4]	Apucarana	Rio Tibagi	Sete Casa	[64504	290	0.195	0.067
[5]	Maringa	Rio Pirapo	Vula Silva Jardim	[64550	4,627	20.842	0.450
[6]	Umuarama	Rio Goio-Ere (	Balsa do Goto-Ere	[64810	320	1.795	0.561

Table-2.20 (2) Probability Drought Discharge

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s
Basin : [1] Cascavel
River : Rio Andradas (Iguacu)
Site : Sao Sebastiao [65979000]
C.A. = 1,309 km2

TR	Duration[days]							
[years]	7	15	30	60	90	120	150	180
2	5.454	5.947	7.053	9.128	11.053	12.893	14.680	16.432
3	4.222	4.604	5.459	7.066	8.556	9.980	11.363	12.720
4	3.615	3.941	4.674	6.049	7.325	8.544	9.728	10.890
5	3.238	3.530	4.186	5.418	6.561	7.653	8.714	9.754
6	2.976	3.245	3.848	4.980	6.030	7.034	8.008	8.964
7	2.780	3.032	3.595	4.653	5.634	6.572	7.483	8.376
8	2.628	2.865	3.398	4.398	5.326	6.212	7.073	7.917
9	2.505	2.731	3.239	4.192	5.076	5.921	6.742	7.547
10	2.403	2.620	3.107	4.021	4.870	5.680	6.467	7.239
15	2.071	2.259	2.678	3.467	4.198	4.896	5.575	6.241
20	1.884	2.054	2.436	3.153	3.818	4.453	5.070	5.675
25	1.760	1.919	2.276	2.945	3.567	4.160	4.737	5.302
30	1.671	1.822	2.161	2.796	3.386	3.950	4.497	5.034
35	1.603	1.748	2.073	2.683	3.248	3.789	4.314	4.829
40	1.549	1.689	2.003	2.592	3.139	3.662	4.169	4.667
45	1.505	1.641	1.946	2.519	3.050	3.558	4.051	4.534
50	1.468	1.601	1.899	2.457	2.975	3.471	3.952	4.423
60	1.410	1.537	1.823	2.359	2.857	3.333	3.794	4.247
70	1.365	1.489	1.765	2.285	2.767	3.227	3.674	4.113
80	1.330	1.450	1.719	2.225	2.695	3.143	3.579	4.006
90	1.301	1.418	1.682	2.177	2.636	3.075	3.501	3.919
100	1.277	1.392	1.651	2.136	2.587	3.017	3.436	3.846

A = 1.78 Alpha = 0.15
B = -0.31 Beta = 1.093
C = 0.091 Gamma = 1.70

Table-2.20 (3) Probability Drought Discharge

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [2] Ponta Grossa
River : Rio Pitangui (Tibagi)
Site : Sumidouro [64450000]
C.A. = 523 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	3.173	4.453	6.432	9.831	12.937	15.905	18.795	21.636
3	2.060	2.891	4.176	6.383	8.400	10.327	12.203	14.048
4	1.519	2.131	3.078	4.706	6.192	7.613	8.996	10.356
5	1.186	1.664	2.403	3.674	4.834	5.943	7.023	8.084
6	0.956	1.341	1.937	2.961	3.896	4.790	5.660	6.516
7	0.785	1.102	1.592	2.433	3.201	3.936	4.651	5.354
8	0.653	0.916	1.323	2.023	2.661	3.272	3.866	4.451
9	0.546	0.767	1.107	1.692	2.227	2.738	3.236	3.725
10	0.458	0.643	0.929	1.420	1.869	2.297	2.715	3.125
15	0.174	0.245	0.354	0.540	0.711	0.874	1.033	1.189
20	0.015	0.022	0.031	0.048	0.063	0.077	0.092	0.105
25	-0.089	-0.124	-0.180	-0.275	-0.361	-0.444	-0.525	-0.604
30	-0.163	-0.229	-0.331	-0.505	-0.665	-0.818	-0.966	-1.112
35	-0.220	-0.308	-0.445	-0.680	-0.895	-1.101	-1.301	-1.497
40	-0.264	-0.371	-0.536	-0.819	-1.077	-1.324	-1.565	-1.801
45	-0.301	-0.422	-0.609	-0.931	-1.225	-1.506	-1.780	-2.049
50	-0.331	-0.464	-0.670	-1.025	-1.349	-1.658	-1.959	-2.255
60	-0.379	-0.531	-0.767	-1.173	-1.544	-1.898	-2.243	-2.581
70	-0.415	-0.582	-0.841	-1.286	-1.692	-2.080	-2.458	-2.829
80	-0.444	-0.623	-0.899	-1.375	-1.809	-2.224	-2.628	-3.025
90	-0.467	-0.656	-0.947	-1.447	-1.905	-2.342	-2.767	-3.185
100	-0.487	-0.683	-0.987	-1.508	-1.984	-2.440	-2.883	-3.319

A = 1.45 Alpha = -0.20
B = 0.17 Beta = 1.076
C = 0.059 Gamma = 1.62

Table-2.20 (4) Probability Drought Discharge

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [3] Londrina
River : Rio Tibagi
Site : Apertados [64504550]
C.A. = 290 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	0.496	0.487	0.529	0.631	0.730	0.826	0.920	1.011
3	0.364	0.358	0.388	0.463	0.536	0.607	0.676	0.743
4	0.308	0.302	0.328	0.392	0.454	0.513	0.571	0.628
5	0.276	0.271	0.295	0.351	0.407	0.461	0.513	0.564
6	0.256	0.251	0.273	0.325	0.377	0.427	0.475	0.522
7	0.242	0.237	0.258	0.307	0.356	0.403	0.448	0.493
8	0.231	0.227	0.246	0.294	0.340	0.385	0.429	0.471
9	0.223	0.219	0.237	0.283	0.328	0.371	0.413	0.454
10	0.216	0.212	0.230	0.275	0.318	0.360	0.401	0.441
15	0.196	0.193	0.209	0.250	0.289	0.328	0.365	0.401
20	0.187	0.183	0.199	0.237	0.275	0.311	0.346	0.381
25	0.181	0.177	0.193	0.230	0.266	0.301	0.335	0.368
30	0.177	0.173	0.188	0.225	0.260	0.294	0.328	0.360
35	0.174	0.170	0.185	0.221	0.256	0.289	0.322	0.354
40	0.171	0.168	0.183	0.218	0.252	0.286	0.318	0.350
45	0.170	0.167	0.181	0.216	0.250	0.283	0.315	0.346
50	0.168	0.165	0.179	0.214	0.248	0.281	0.312	0.343
60	0.166	0.163	0.177	0.211	0.245	0.277	0.308	0.339
70	0.165	0.162	0.176	0.209	0.243	0.274	0.306	0.336
80	0.163	0.161	0.174	0.208	0.241	0.273	0.303	0.334
90	0.163	0.160	0.173	0.207	0.239	0.271	0.302	0.332
100	0.162	0.159	0.173	0.206	0.238	0.270	0.300	0.330

A = 1.32 Alpha = 0.25
B = -0.48 Beta = 1.020
C = 0.098 Gamma = 1.10

Table-2.20 (5) Probability Drought Discharge

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [4] Apucarana
River : Rio Tibagi
Site : Sete Casa [64504500]
C.A. = 290 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	0.449	0.415	0.431	0.498	0.568	0.638	0.707	0.775
3	0.330	0.305	0.317	0.366	0.417	0.469	0.519	0.569
4	0.279	0.258	0.268	0.309	0.353	0.396	0.439	0.481
5	0.250	0.231	0.240	0.277	0.317	0.356	0.394	0.432
6	0.231	0.214	0.223	0.257	0.293	0.329	0.365	0.400
7	0.218	0.202	0.210	0.242	0.277	0.311	0.344	0.377
8	0.209	0.193	0.201	0.232	0.265	0.297	0.329	0.361
9	0.201	0.186	0.194	0.223	0.255	0.286	0.317	0.348
10	0.195	0.181	0.188	0.217	0.248	0.278	0.308	0.337
15	0.178	0.164	0.171	0.197	0.225	0.253	0.280	0.307
20	0.169	0.156	0.162	0.187	0.214	0.240	0.266	0.291
25	0.163	0.151	0.157	0.181	0.207	0.232	0.257	0.282
30	0.160	0.148	0.153	0.177	0.202	0.227	0.251	0.275
35	0.157	0.145	0.151	0.174	0.199	0.223	0.247	0.271
40	0.155	0.143	0.149	0.172	0.196	0.220	0.244	0.267
45	0.153	0.142	0.147	0.170	0.194	0.218	0.242	0.265
50	0.152	0.141	0.146	0.169	0.193	0.216	0.240	0.263
60	0.150	0.139	0.144	0.167	0.190	0.214	0.237	0.259
70	0.149	0.138	0.143	0.165	0.188	0.212	0.234	0.257
80	0.148	0.137	0.142	0.164	0.187	0.210	0.233	0.255
90	0.147	0.136	0.141	0.163	0.186	0.209	0.231	0.254
100	0.146	0.135	0.141	0.162	0.185	0.208	0.230	0.252

A = 1.43 Alpha = 0.25
B = -0.61 Beta = 1.022
C = 0.109 Gamma = 1.10

Table-2.20 (6) Probability Drought Discharge

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : [5] Maringa
River : Rio Pirapo
Site : Vula Silva Jardim [64550000]
C.A. = 4,627 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	34.771	35.504	38.093	42.925	47.088	50.798	54.191	57.346
3	30.226	30.863	33.114	37.314	40.933	44.158	47.107	49.850
4	27.576	28.157	30.211	34.043	37.345	40.287	42.978	45.480
5	25.735	26.278	28.194	31.770	34.852	37.598	40.109	42.444
6	24.341	24.853	26.666	30.048	32.962	35.560	37.935	40.143
7	23.226	23.715	25.445	28.673	31.454	33.932	36.198	38.306
8	22.304	22.774	24.435	27.534	30.204	32.585	34.761	36.784
9	21.520	21.974	23.577	26.567	29.144	31.440	33.540	35.492
10	20.842	21.281	22.833	25.729	28.225	30.449	32.482	34.373
15	18.406	18.793	20.164	22.722	24.925	26.889	28.685	30.355
20	16.825	17.180	18.433	20.771	22.785	24.581	26.222	27.749
25	15.674	16.004	17.171	19.349	21.226	22.898	24.428	25.850
30	14.777	15.089	16.189	18.243	20.012	21.589	23.031	24.371
35	14.049	14.345	15.391	17.343	19.025	20.524	21.895	23.169
40	13.438	13.721	14.722	16.589	18.198	19.632	20.943	22.162
45	12.914	13.186	14.148	15.943	17.489	18.867	20.127	21.299
50	12.458	12.720	13.648	15.379	16.871	18.200	19.415	20.546
60	11.692	11.939	12.810	14.434	15.834	17.082	18.223	19.284
70	11.069	11.302	12.127	13.665	14.990	16.171	17.251	18.256
80	10.546	10.768	11.554	13.019	14.282	15.407	16.436	17.393
90	10.098	10.310	11.062	12.465	13.674	14.752	15.737	16.653
100	9.706	9.910	10.633	11.982	13.144	14.180	15.126	16.007

A = 2.22 Alpha = -0.22
B = -0.21 Beta = 1.112
C = 0.051 Gamma = 4.72

Table-2.20 (7) Probability Drought Discharge

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s
Basin : [6] Umuarama
River : Rio Goio-Ere (Piquiri)
Site : Balsa do Goto-Ere [64810000]
C.A. = 320 km2

TR	Duration[days]							
[years]	7	15	30	60	90	120	150	180
2	2.722	2.824	3.022	3.341	3.597	3.817	4.012	4.189
3	2.354	2.442	2.613	2.889	3.111	3.300	3.469	3.622
4	2.170	2.251	2.409	2.663	2.867	3.042	3.198	3.339
5	2.054	2.131	2.281	2.521	2.715	2.880	3.027	3.161
6	1.973	2.047	2.191	2.422	2.608	2.767	2.908	3.037
7	1.913	1.984	2.124	2.348	2.528	2.682	2.819	2.943
8	1.865	1.935	2.071	2.289	2.465	2.615	2.749	2.870
9	1.827	1.895	2.028	2.242	2.414	2.561	2.692	2.811
10	1.795	1.862	1.992	2.203	2.372	2.516	2.645	2.762
15	1.689	1.753	1.876	2.074	2.233	2.369	2.490	2.600
20	1.629	1.690	1.809	2.000	2.153	2.284	2.401	2.507
25	1.589	1.649	1.764	1.951	2.100	2.228	2.342	2.445
30	1.560	1.618	1.732	1.915	2.062	2.187	2.299	2.401
35	1.538	1.595	1.707	1.887	2.032	2.156	2.266	2.366
40	1.520	1.577	1.687	1.866	2.009	2.131	2.240	2.339
45	1.505	1.562	1.671	1.848	1.989	2.111	2.219	2.317
50	1.493	1.549	1.658	1.833	1.973	2.094	2.201	2.298
60	1.474	1.529	1.636	1.809	1.948	2.066	2.172	2.268
70	1.459	1.513	1.619	1.791	1.928	2.045	2.150	2.245
80	1.447	1.501	1.606	1.776	1.912	2.029	2.132	2.226
90	1.437	1.491	1.595	1.764	1.899	2.015	2.118	2.211
100	1.429	1.482	1.586	1.754	1.888	2.003	2.106	2.199

A = 2.28 Alpha = 0.45
B = -0.11 Beta = 1.060
C = 0.034 Gamma = 1.80

Drought Discharge [Return Period(10years)～ Duration Time(7days)] Unit:m3/s

No.	Basin	River	Site Name	Area [km2]	Q10,7 [m3/s]	[m3/s/100km2]
	GUARAPUAVA	Guarapuava	Guarapuava	100	0.180	0.180
	MEDIANEIRA	Medianeira	Medianeira	100	0.268	0.268
	DOIS VIZINHOS	Dois Vizinhos	Dois Vizinhos	100	0.125	0.125
	FRANCISCO BELTORAO	Francisco Belt	Francisco Beltorao	100	0.341	0.341
	PATO BRANCO	Pato Branco	Pato Branco	100	0.363	0.363
	PALMAS	Palmas	Palmas	100	0.281	0.281
	CASTRO	Castro	Castro	100	0.179	0.179
	IRATI	Irati	Irati	100	0.151	0.151
	CORNEIRO PROCOPIO	Cornriro Proco	Cornriro Procopio	100	0.086	0.086
	ARAPONGAS	Arapongas	Arapongas	100	0.101	0.101
	IBIPORA	Ibipora	Ibipora	100	0.091	0.091

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : GUARAPUAVA
River : Guarapuava
Site : Guarapuava
C.A. = 100 km2

TR	Duration[days]							
[years]	7	15	30	60	90	120	150	180
2	0.309	0.352	0.433	0.582	0.719	0.851	0.980	1.107
3	0.252	0.287	0.353	0.474	0.586	0.694	0.799	0.902
4	0.226	0.257	0.317	0.425	0.526	0.622	0.716	0.809
5	0.211	0.240	0.295	0.396	0.490	0.580	0.668	0.755
6	0.201	0.228	0.281	0.377	0.467	0.552	0.636	0.718
7	0.193	0.220	0.271	0.364	0.450	0.532	0.613	0.692
8	0.188	0.214	0.263	0.353	0.437	0.517	0.595	0.672
9	0.184	0.209	0.257	0.345	0.426	0.505	0.581	0.656
10	0.180	0.205	0.252	0.338	0.418	0.495	0.570	0.644
15	0.169	0.192	0.236	0.317	0.392	0.464	0.535	0.604
20	0.163	0.185	0.228	0.306	0.379	0.448	0.516	0.583
25	0.159	0.181	0.223	0.299	0.370	0.438	0.505	0.570
30	0.157	0.178	0.220	0.295	0.364	0.431	0.497	0.561
35	0.155	0.176	0.217	0.291	0.360	0.426	0.491	0.554
40	0.153	0.175	0.215	0.288	0.357	0.422	0.486	0.549
45	0.152	0.173	0.213	0.286	0.354	0.419	0.482	0.545
50	0.151	0.172	0.212	0.284	0.352	0.416	0.479	0.541
60	0.150	0.170	0.210	0.282	0.348	0.412	0.475	0.536
70	0.149	0.169	0.208	0.280	0.346	0.409	0.471	0.532
80	0.148	0.168	0.207	0.278	0.344	0.407	0.469	0.529
90	0.147	0.168	0.206	0.277	0.342	0.405	0.466	0.527
100	0.147	0.167	0.205	0.276	0.341	0.404	0.465	0.525

A = 1.40 Alpha = 0.40
B = -0.25 Beta = 1.040
C = 0.090 Gamma = 1.30

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : MEDIANEIRA
River : Medianeira
Site : Medianeira
C.A. = 100 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	0.538	0.581	0.696	0.925	1.145	1.362	1.578	1.793
3	0.430	0.465	0.557	0.740	0.916	1.090	1.262	1.435
4	0.376	0.407	0.487	0.647	0.802	0.954	1.105	1.256
5	0.343	0.371	0.444	0.590	0.730	0.869	1.006	1.144
6	0.319	0.345	0.414	0.549	0.680	0.809	0.937	1.065
7	0.302	0.326	0.391	0.519	0.643	0.765	0.886	1.007
8	0.288	0.312	0.373	0.495	0.614	0.730	0.845	0.961
9	0.277	0.299	0.359	0.476	0.590	0.702	0.813	0.924
10	0.268	0.289	0.347	0.460	0.570	0.678	0.785	0.893
15	0.237	0.257	0.307	0.408	0.505	0.601	0.696	0.791
20	0.220	0.238	0.285	0.378	0.469	0.557	0.645	0.734
25	0.208	0.225	0.270	0.358	0.444	0.528	0.612	0.695
30	0.200	0.216	0.259	0.344	0.426	0.507	0.587	0.667
35	0.194	0.209	0.251	0.333	0.413	0.491	0.568	0.646
40	0.189	0.204	0.244	0.324	0.402	0.478	0.553	0.629
45	0.184	0.199	0.239	0.317	0.393	0.467	0.541	0.615
50	0.181	0.196	0.234	0.311	0.385	0.458	0.531	0.603
60	0.175	0.190	0.227	0.302	0.374	0.444	0.515	0.585
70	0.171	0.185	0.221	0.294	0.364	0.433	0.502	0.571
80	0.168	0.181	0.217	0.288	0.357	0.425	0.492	0.559
90	0.165	0.178	0.213	0.283	0.351	0.418	0.484	0.550
100	0.162	0.176	0.210	0.279	0.346	0.412	0.477	0.542

A = 2.10 Alpha = 0.22
B = -0.40 Beta = 1.120
C = 0.108 Gamma = 1.78

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : DOIS VIZINHOS
River : Dois Vizinhos
Site : Dois Vizinhos
C.A. = 100 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	0.339	0.380	0.462	0.614	0.755	0.890	1.023	1.153
3	0.253	0.283	0.344	0.457	0.562	0.663	0.761	0.859
4	0.210	0.235	0.286	0.379	0.467	0.551	0.632	0.713
5	0.183	0.205	0.249	0.331	0.408	0.481	0.552	0.623
6	0.165	0.185	0.224	0.298	0.367	0.432	0.497	0.560
7	0.151	0.169	0.206	0.273	0.336	0.396	0.455	0.513
8	0.140	0.157	0.191	0.254	0.312	0.368	0.423	0.477
9	0.132	0.147	0.179	0.238	0.293	0.346	0.397	0.448
10	0.125	0.139	0.169	0.225	0.277	0.327	0.375	0.423
15	0.101	0.113	0.138	0.183	0.225	0.265	0.305	0.344
20	0.088	0.098	0.120	0.159	0.196	0.231	0.265	0.299
25	0.079	0.089	0.108	0.143	0.176	0.208	0.239	0.269
30	0.073	0.082	0.099	0.132	0.162	0.191	0.220	0.248
35	0.068	0.076	0.093	0.123	0.152	0.179	0.205	0.232
40	0.064	0.072	0.088	0.116	0.143	0.169	0.194	0.219
45	0.061	0.069	0.083	0.111	0.136	0.161	0.185	0.208
50	0.059	0.066	0.080	0.106	0.131	0.154	0.177	0.199
60	0.055	0.061	0.074	0.099	0.121	0.143	0.164	0.185
70	0.051	0.058	0.070	0.093	0.114	0.135	0.155	0.175
80	0.049	0.055	0.067	0.088	0.109	0.128	0.147	0.166
90	0.047	0.052	0.064	0.085	0.104	0.123	0.141	0.159
100	0.045	0.051	0.062	0.082	0.100	0.119	0.136	0.154

A = 1.51 Alpha = 0.05
B = -0.28 Beta = 1.120
C = 0.092 Gamma = 1.70

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : FRANCISCO BELTORAO
River : Francisco Beltorao
Site : Francisco Beltorao
C.A. = 100 km2

TR	Duration[days]							
[years]	7	15	30	60	90	120	150	180
2	0.562	0.581	0.674	0.875	1.075	1.272	1.470	1.668
3	0.463	0.479	0.556	0.722	0.886	1.049	1.212	1.376
4	0.419	0.433	0.503	0.653	0.802	0.949	1.096	1.244
5	0.393	0.407	0.472	0.613	0.752	0.891	1.029	1.168
6	0.376	0.389	0.452	0.586	0.720	0.852	0.984	1.117
7	0.364	0.376	0.437	0.567	0.696	0.824	0.952	1.081
8	0.355	0.367	0.426	0.553	0.679	0.803	0.928	1.053
9	0.347	0.359	0.417	0.541	0.665	0.787	0.909	1.031
10	0.341	0.353	0.410	0.532	0.653	0.773	0.893	1.014
15	0.323	0.334	0.388	0.504	0.619	0.732	0.846	0.960
20	0.314	0.325	0.377	0.489	0.600	0.711	0.821	0.932
25	0.308	0.318	0.369	0.480	0.589	0.697	0.805	0.914
30	0.304	0.314	0.365	0.473	0.581	0.688	0.795	0.902
35	0.301	0.311	0.361	0.469	0.575	0.681	0.787	0.893
40	0.298	0.309	0.358	0.465	0.571	0.676	0.781	0.886
45	0.296	0.307	0.356	0.462	0.567	0.672	0.776	0.880
50	0.295	0.305	0.354	0.460	0.564	0.668	0.772	0.876
60	0.293	0.303	0.351	0.456	0.560	0.663	0.766	0.869
70	0.291	0.301	0.349	0.453	0.557	0.659	0.761	0.864
80	0.290	0.300	0.348	0.451	0.554	0.656	0.758	0.860
90	0.288	0.298	0.346	0.450	0.552	0.654	0.755	0.857
100	0.288	0.298	0.345	0.448	0.550	0.652	0.753	0.854

A = 2.35 Alpha = 0.45
B = -0.50 Beta = 1.065
C = 0.117 Gamma = 1.26

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : PATO BRANCO
River : Pato Branco
Site : Pato Branco
C.A. = 100 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	0.594	0.653	0.792	1.067	1.332	1.594	1.854	2.115
3	0.487	0.535	0.649	0.875	1.092	1.307	1.520	1.734
4	0.441	0.484	0.587	0.791	0.988	1.182	1.375	1.568
5	0.414	0.455	0.552	0.743	0.928	1.111	1.292	1.474
6	0.397	0.436	0.529	0.712	0.890	1.064	1.238	1.412
7	0.385	0.422	0.513	0.690	0.862	1.032	1.200	1.369
8	0.375	0.412	0.500	0.674	0.842	1.007	1.172	1.336
9	0.368	0.404	0.491	0.661	0.826	0.988	1.149	1.311
10	0.363	0.398	0.483	0.651	0.813	0.973	1.132	1.291
15	0.345	0.379	0.460	0.620	0.775	0.927	1.078	1.230
20	0.337	0.370	0.449	0.604	0.755	0.903	1.051	1.198
25	0.331	0.364	0.442	0.595	0.743	0.889	1.034	1.179
30	0.328	0.360	0.437	0.588	0.735	0.879	1.022	1.166
35	0.325	0.357	0.433	0.583	0.729	0.872	1.014	1.157
40	0.323	0.355	0.430	0.580	0.724	0.866	1.008	1.150
45	0.321	0.353	0.428	0.577	0.721	0.862	1.003	1.144
50	0.320	0.351	0.427	0.575	0.718	0.859	0.999	1.139
60	0.318	0.349	0.424	0.571	0.713	0.853	0.993	1.132
70	0.317	0.348	0.422	0.569	0.710	0.849	0.988	1.127
80	0.316	0.347	0.421	0.567	0.708	0.846	0.985	1.123
90	0.315	0.346	0.420	0.565	0.706	0.844	0.982	1.120
100	0.314	0.345	0.419	0.564	0.704	0.842	0.980	1.118

A = 2.25 Alpha = 0.45
B = -0.38 Beta = 1.030
C = 0.108 Gamma = 1.15

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : PALMAS
River : Palmas
Site : Palmas
C.A. = 100 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	0.494	0.621	0.836	1.228	1.601	1.967	2.331	2.697
3	0.394	0.495	0.666	0.979	1.276	1.568	1.858	2.149
4	0.351	0.441	0.594	0.872	1.137	1.397	1.656	1.916
5	0.327	0.411	0.553	0.813	1.059	1.301	1.542	1.784
6	0.311	0.391	0.527	0.774	1.009	1.239	1.469	1.699
7	0.301	0.377	0.508	0.747	0.973	1.196	1.417	1.639
8	0.292	0.367	0.495	0.727	0.947	1.163	1.379	1.595
9	0.286	0.359	0.484	0.711	0.927	1.139	1.349	1.561
10	0.281	0.353	0.476	0.698	0.910	1.119	1.326	1.534
15	0.266	0.334	0.450	0.661	0.862	1.059	1.255	1.452
20	0.259	0.325	0.437	0.642	0.837	1.029	1.220	1.411
25	0.254	0.319	0.430	0.631	0.823	1.011	1.198	1.386
30	0.251	0.315	0.424	0.623	0.813	0.998	1.183	1.369
35	0.249	0.312	0.421	0.618	0.805	0.990	1.173	1.357
40	0.247	0.310	0.418	0.614	0.800	0.983	1.165	1.348
45	0.246	0.309	0.416	0.611	0.796	0.978	1.159	1.340
50	0.245	0.307	0.414	0.608	0.792	0.973	1.154	1.335
60	0.243	0.305	0.411	0.604	0.787	0.967	1.146	1.326
70	0.242	0.304	0.409	0.601	0.783	0.962	1.141	1.320
80	0.241	0.303	0.408	0.599	0.780	0.959	1.137	1.315
90	0.240	0.302	0.407	0.597	0.778	0.956	1.133	1.311
100	0.240	0.301	0.406	0.596	0.776	0.954	1.131	1.308

A = 1.66 Alpha = 0.40
B = -0.12 Beta = 1.020
C = 0.090 Gamma = 1.10

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : CASTRO
River : Castro
Site : Castro
C.A. = 100 km2

TR	Duration[days]							
[years]	7	15	30	60	90	120	150	180
2	0.320	0.354	0.409	0.494	0.565	0.628	0.685	0.738
3	0.261	0.288	0.333	0.402	0.460	0.511	0.557	0.600
4	0.232	0.257	0.296	0.359	0.410	0.455	0.497	0.535
5	0.215	0.238	0.275	0.332	0.380	0.422	0.460	0.496
6	0.204	0.225	0.260	0.314	0.359	0.399	0.435	0.469
7	0.195	0.216	0.249	0.301	0.344	0.382	0.417	0.449
8	0.188	0.209	0.240	0.291	0.333	0.369	0.403	0.434
9	0.183	0.203	0.234	0.283	0.323	0.359	0.392	0.422
10	0.179	0.198	0.228	0.276	0.316	0.351	0.382	0.412
15	0.165	0.183	0.211	0.255	0.292	0.324	0.353	0.381
20	0.158	0.175	0.201	0.244	0.278	0.309	0.337	0.363
25	0.153	0.169	0.195	0.236	0.270	0.300	0.327	0.352
30	0.150	0.165	0.191	0.231	0.264	0.293	0.320	0.344
35	0.147	0.163	0.187	0.227	0.259	0.288	0.314	0.338
40	0.145	0.160	0.185	0.224	0.256	0.284	0.310	0.334
45	0.143	0.159	0.183	0.221	0.253	0.281	0.306	0.330
50	0.142	0.157	0.181	0.219	0.250	0.278	0.303	0.327
60	0.140	0.155	0.178	0.216	0.247	0.274	0.299	0.322
70	0.138	0.153	0.176	0.213	0.244	0.271	0.296	0.319
80	0.137	0.152	0.175	0.212	0.242	0.269	0.293	0.316
90	0.136	0.151	0.174	0.210	0.240	0.267	0.291	0.313
100	0.135	0.150	0.173	0.209	0.239	0.265	0.289	0.311

A = 1.27 Alpha = 0.35
B = -0.10 Beta = 1.060
C = 0.050 Gamma = 1.48

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : IRATI
River : Irati
Site : Irati
C.A. = 100 km2

TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	0.344	0.377	0.448	0.581	0.704	0.821	0.935	1.047
3	0.270	0.295	0.351	0.455	0.552	0.643	0.733	0.820
4	0.232	0.253	0.301	0.391	0.473	0.552	0.629	0.704
5	0.207	0.227	0.270	0.350	0.424	0.494	0.563	0.630
6	0.190	0.208	0.247	0.321	0.388	0.453	0.516	0.577
7	0.177	0.194	0.230	0.298	0.362	0.422	0.480	0.538
8	0.166	0.182	0.217	0.281	0.340	0.397	0.452	0.506
9	0.158	0.173	0.206	0.267	0.323	0.377	0.429	0.480
10	0.151	0.165	0.196	0.255	0.309	0.360	0.410	0.459
15	0.127	0.139	0.166	0.215	0.260	0.304	0.346	0.387
20	0.114	0.124	0.148	0.192	0.232	0.271	0.309	0.345
25	0.104	0.114	0.136	0.176	0.213	0.249	0.283	0.317
30	0.097	0.107	0.127	0.165	0.199	0.233	0.265	0.296
35	0.092	0.101	0.120	0.156	0.189	0.220	0.251	0.280
40	0.088	0.096	0.115	0.148	0.180	0.210	0.239	0.268
45	0.084	0.092	0.110	0.143	0.173	0.202	0.229	0.257
50	0.082	0.089	0.106	0.138	0.167	0.194	0.221	0.248
60	0.077	0.084	0.100	0.130	0.157	0.183	0.209	0.233
70	0.073	0.080	0.095	0.123	0.149	0.174	0.199	0.222
80	0.070	0.077	0.091	0.118	0.143	0.167	0.190	0.213
90	0.068	0.074	0.088	0.114	0.138	0.161	0.184	0.206
100	0.066	0.072	0.085	0.111	0.134	0.156	0.178	0.199

A = 1.54 Alpha = 0.08
B = -0.30 Beta = 1.115
C = 0.090 Gamma = 2.00

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : CORNEIRO PROCOPIO
River : Cornrfro Procopio
Site : Cornrfro Procopio
C.A. = 100 km2

TR	Duration[days]							
[years]	7	15	30	60	90	120	150	180
2	0.197	0.205	0.232	0.287	0.338	0.386	0.433	0.478
3	0.145	0.150	0.170	0.211	0.248	0.283	0.318	0.351
4	0.123	0.127	0.144	0.178	0.210	0.240	0.269	0.297
5	0.110	0.114	0.129	0.160	0.188	0.215	0.241	0.267
6	0.102	0.106	0.120	0.148	0.174	0.199	0.223	0.247
7	0.096	0.100	0.113	0.140	0.164	0.188	0.211	0.233
8	0.092	0.095	0.108	0.133	0.157	0.180	0.202	0.223
9	0.089	0.092	0.104	0.129	0.152	0.173	0.194	0.215
10	0.086	0.089	0.101	0.125	0.147	0.168	0.189	0.208
15	0.078	0.081	0.092	0.114	0.134	0.153	0.171	0.189
20	0.074	0.077	0.087	0.108	0.127	0.145	0.163	0.180
25	0.072	0.075	0.085	0.104	0.123	0.141	0.158	0.174
30	0.070	0.073	0.083	0.102	0.120	0.137	0.154	0.170
35	0.069	0.072	0.081	0.100	0.118	0.135	0.152	0.167
40	0.068	0.071	0.080	0.099	0.117	0.133	0.150	0.165
45	0.068	0.070	0.079	0.098	0.116	0.132	0.148	0.164
50	0.067	0.070	0.079	0.097	0.115	0.131	0.147	0.162
60	0.066	0.069	0.078	0.096	0.113	0.129	0.145	0.160
70	0.066	0.068	0.077	0.095	0.112	0.128	0.144	0.159
80	0.065	0.068	0.077	0.095	0.111	0.127	0.143	0.158
90	0.065	0.067	0.076	0.094	0.111	0.127	0.142	0.157
100	0.064	0.067	0.076	0.094	0.110	0.126	0.141	0.156

A = 1.28 Alpha = 0.25
B = -0.37 Beta = 1.020
C = 0.090 Gamma = 1.10

Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

Basin : ARAPONGAS
River : Araponga s
Site : Araponga s
C.A. = 100 km2

TR	Duration[days]							
[years]	7	15	30	60	90	120	150	180
2	0.197	0.187	0.201	0.241	0.282	0.323	0.363	0.403
3	0.153	0.146	0.156	0.188	0.220	0.251	0.283	0.314
4	0.134	0.127	0.137	0.164	0.192	0.220	0.247	0.274
5	0.123	0.117	0.126	0.151	0.176	0.202	0.227	0.252
6	0.116	0.110	0.118	0.142	0.166	0.190	0.214	0.237
7	0.111	0.105	0.113	0.135	0.159	0.181	0.204	0.227
8	0.107	0.102	0.109	0.131	0.153	0.175	0.197	0.219
9	0.104	0.099	0.106	0.127	0.149	0.170	0.191	0.213
10	0.101	0.096	0.104	0.124	0.145	0.166	0.187	0.208
15	0.094	0.089	0.096	0.115	0.135	0.154	0.174	0.193
20	0.090	0.086	0.092	0.111	0.129	0.148	0.167	0.185
25	0.088	0.084	0.090	0.108	0.126	0.144	0.162	0.180
30	0.086	0.082	0.088	0.106	0.124	0.142	0.159	0.177
35	0.085	0.081	0.087	0.104	0.122	0.140	0.157	0.175
40	0.084	0.080	0.086	0.103	0.121	0.138	0.156	0.173
45	0.084	0.080	0.085	0.102	0.120	0.137	0.154	0.171
50	0.083	0.079	0.085	0.102	0.119	0.136	0.153	0.170
60	0.082	0.078	0.084	0.101	0.118	0.135	0.152	0.168
70	0.082	0.078	0.083	0.100	0.117	0.134	0.151	0.167
80	0.081	0.077	0.083	0.099	0.116	0.133	0.150	0.166
90	0.081	0.077	0.082	0.099	0.116	0.132	0.149	0.165
100	0.080	0.076	0.082	0.098	0.115	0.132	0.148	0.165

A = 1.58 Alpha = 0.33
B = -0.60 Beta = 1.030
C = 0.115 Gamma = 1.18

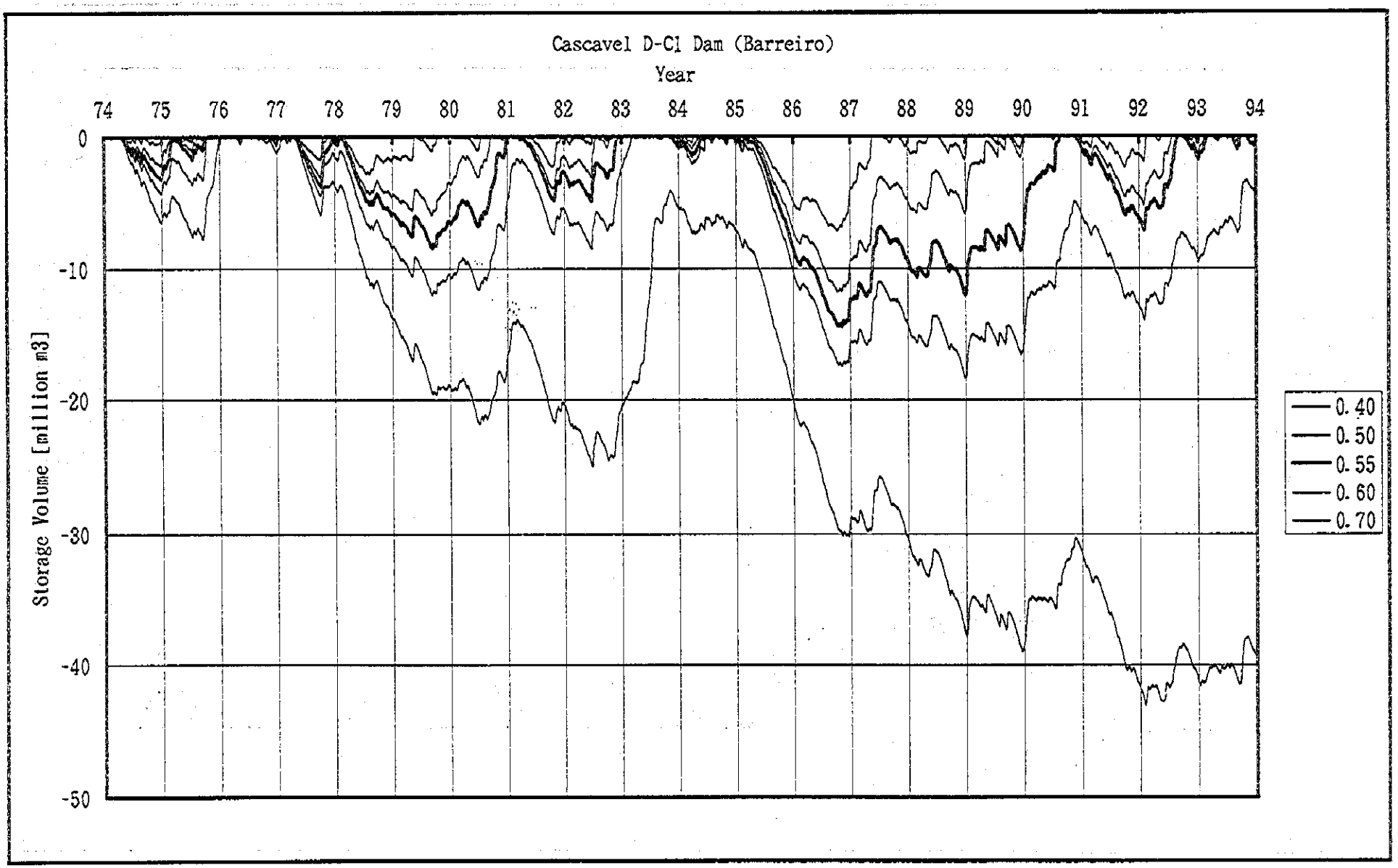
Probability Drought Discharge [Return Period ~ Duration Time] Unit:m3/s

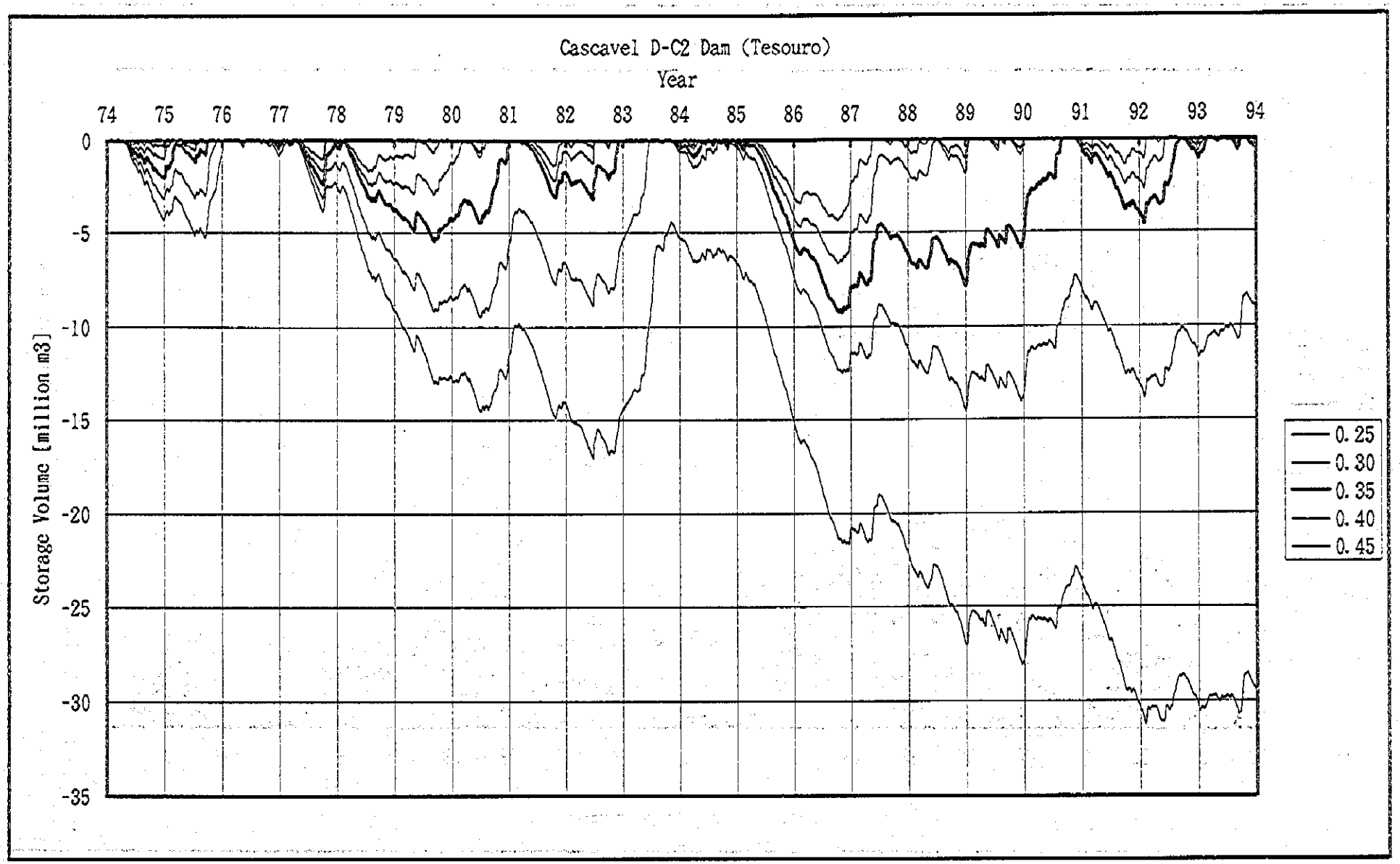
Basin : IBIPORA
River : Ibipora
Site : Ibipora
C.A. = 100 km2

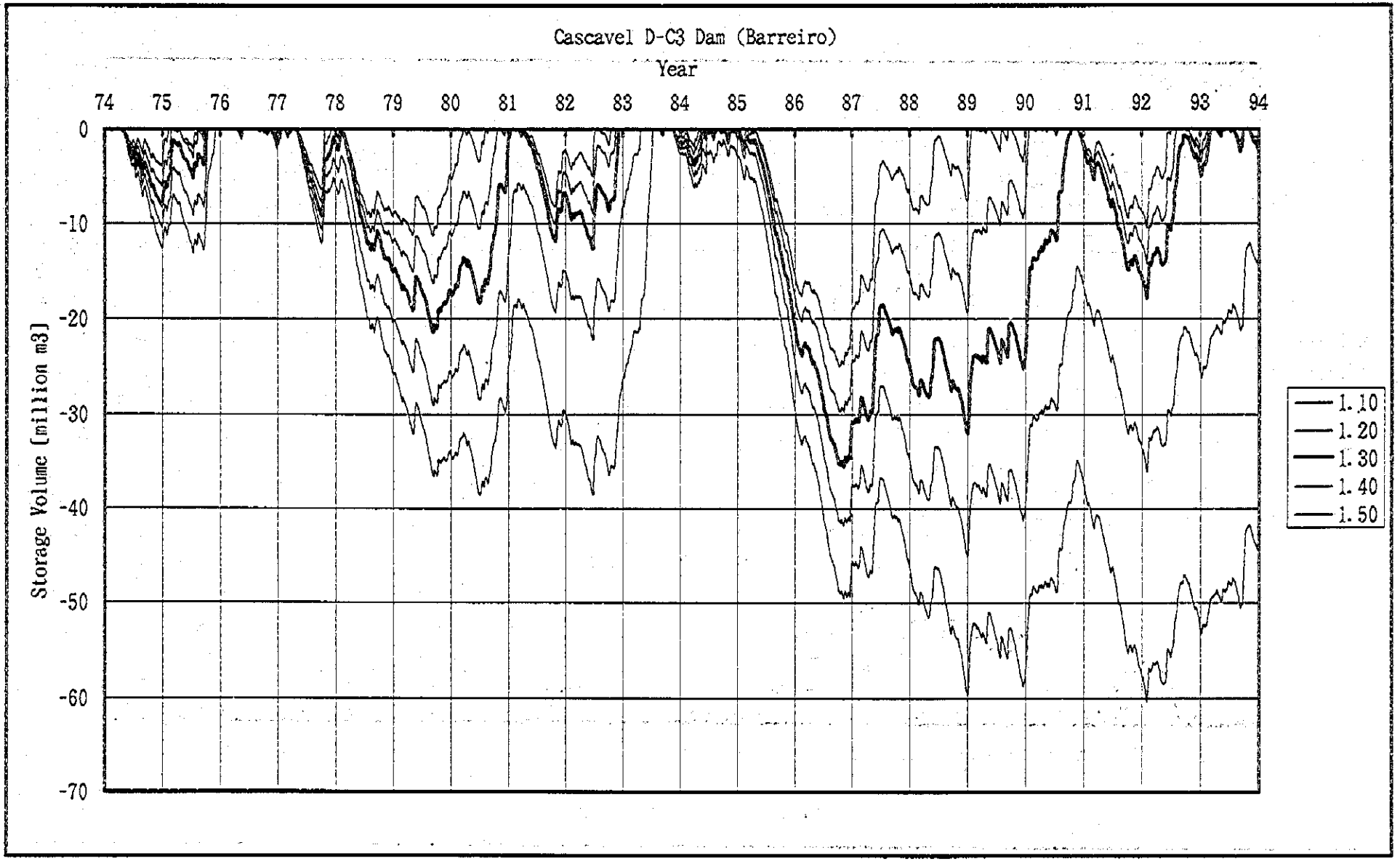
TR [years]	Duration[days] 7	15	30	60	90	120	150	180
2	0.178	0.169	0.177	0.205	0.233	0.260	0.286	0.311
3	0.138	0.131	0.137	0.159	0.180	0.201	0.221	0.241
4	0.120	0.114	0.120	0.139	0.157	0.176	0.193	0.211
5	0.110	0.105	0.110	0.127	0.144	0.161	0.177	0.193
6	0.104	0.099	0.104	0.120	0.136	0.152	0.167	0.182
7	0.099	0.094	0.099	0.114	0.130	0.145	0.160	0.174
8	0.096	0.091	0.096	0.111	0.126	0.140	0.154	0.168
9	0.093	0.089	0.093	0.107	0.122	0.136	0.150	0.163
10	0.091	0.087	0.091	0.105	0.119	0.133	0.146	0.160
15	0.085	0.080	0.085	0.098	0.111	0.124	0.136	0.148
20	0.081	0.077	0.081	0.094	0.107	0.119	0.131	0.143
25	0.079	0.075	0.079	0.091	0.104	0.116	0.128	0.139
30	0.078	0.074	0.078	0.090	0.102	0.114	0.125	0.137
35	0.077	0.073	0.077	0.089	0.101	0.112	0.124	0.135
40	0.076	0.072	0.076	0.088	0.100	0.111	0.123	0.134
45	0.076	0.072	0.076	0.087	0.099	0.111	0.122	0.133
50	0.075	0.071	0.075	0.087	0.098	0.110	0.121	0.132
60	0.074	0.071	0.074	0.086	0.097	0.109	0.120	0.130
70	0.074	0.070	0.074	0.085	0.097	0.108	0.119	0.129
80	0.074	0.070	0.073	0.085	0.096	0.107	0.118	0.129
90	0.073	0.069	0.073	0.084	0.096	0.107	0.118	0.128
100	0.073	0.069	0.073	0.084	0.095	0.106	0.117	0.128

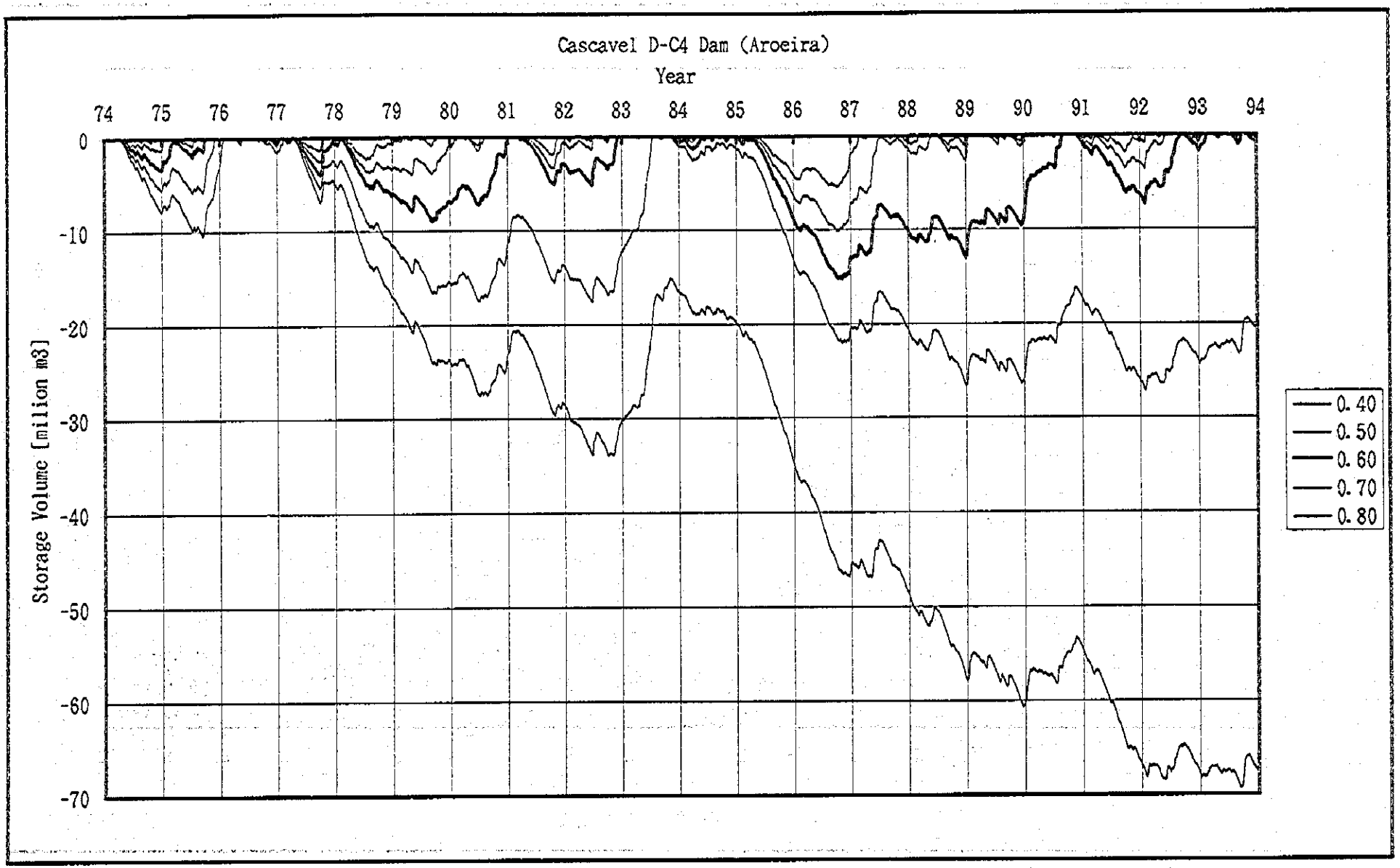
A = 1.40 Alpha = 0.33
B = -0.52 Beta = 1.025
C = 0.097 Gamma = 1.15

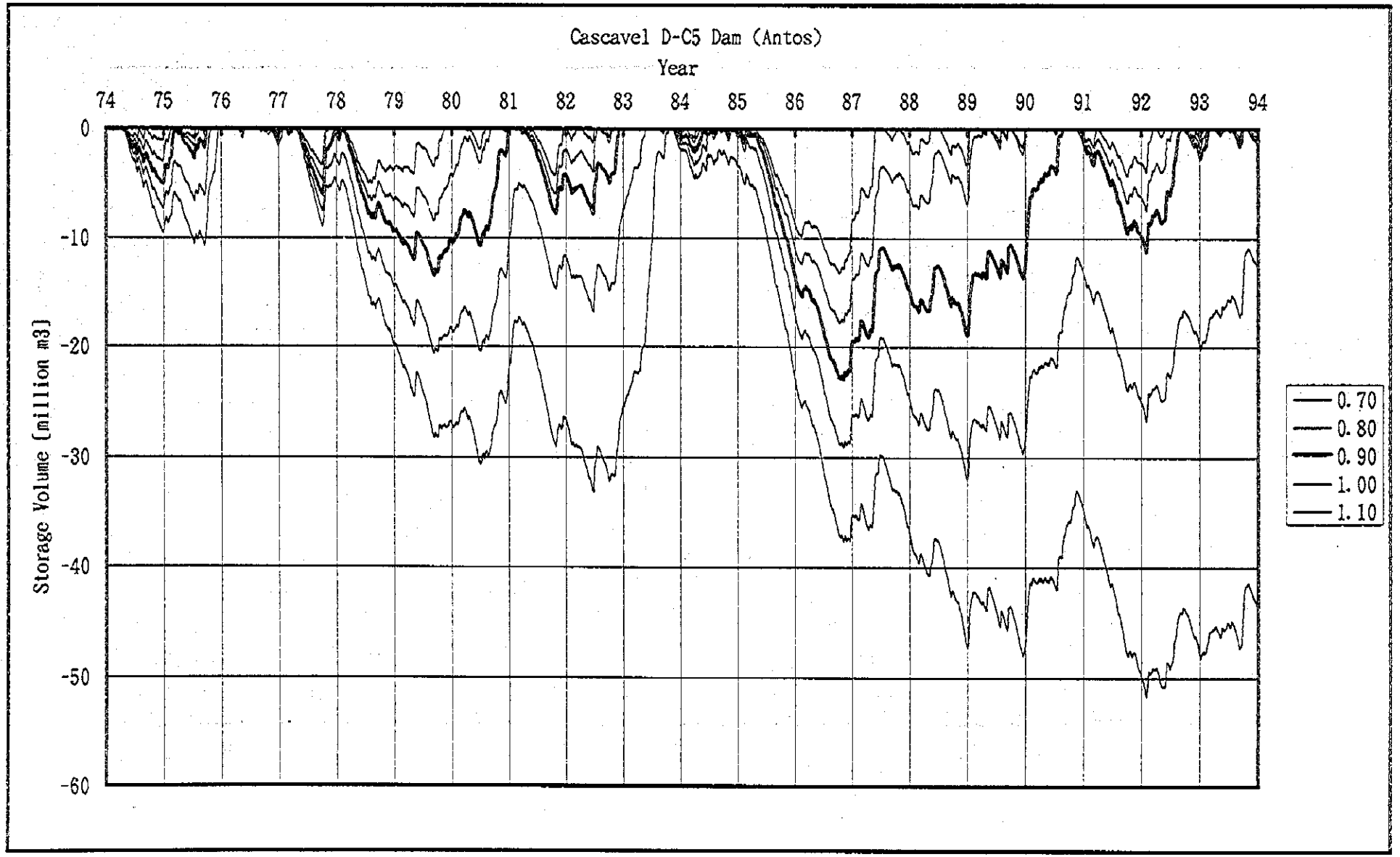
II-2 Dam Reservoir Operation Curve

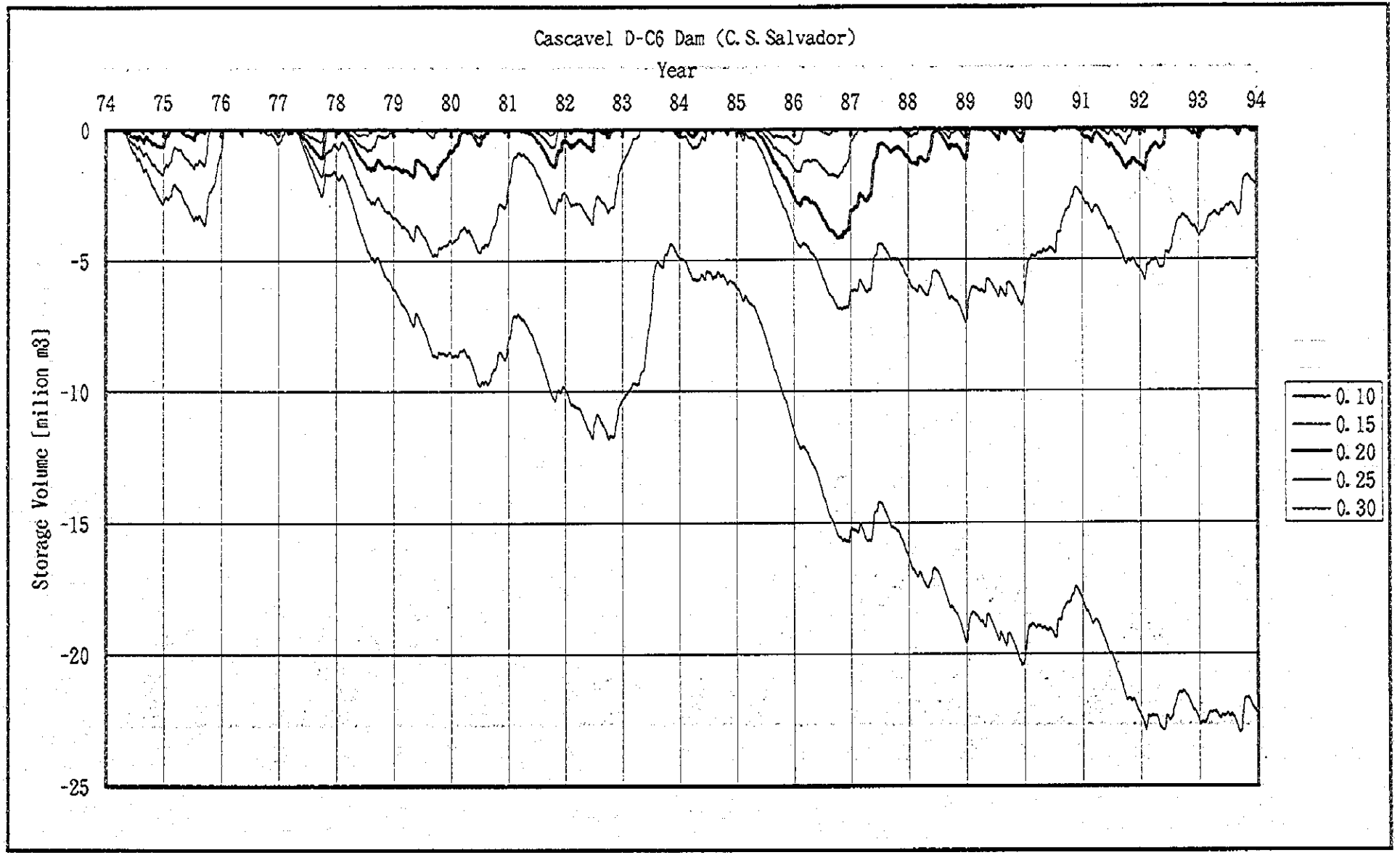

Cascavel D-Cl Dam (Barreiro)
Year
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
0
-10
-20
-30
-40
-50
Storage Volume [million m3]
0.40
0.50
0.55
0.60
0.70

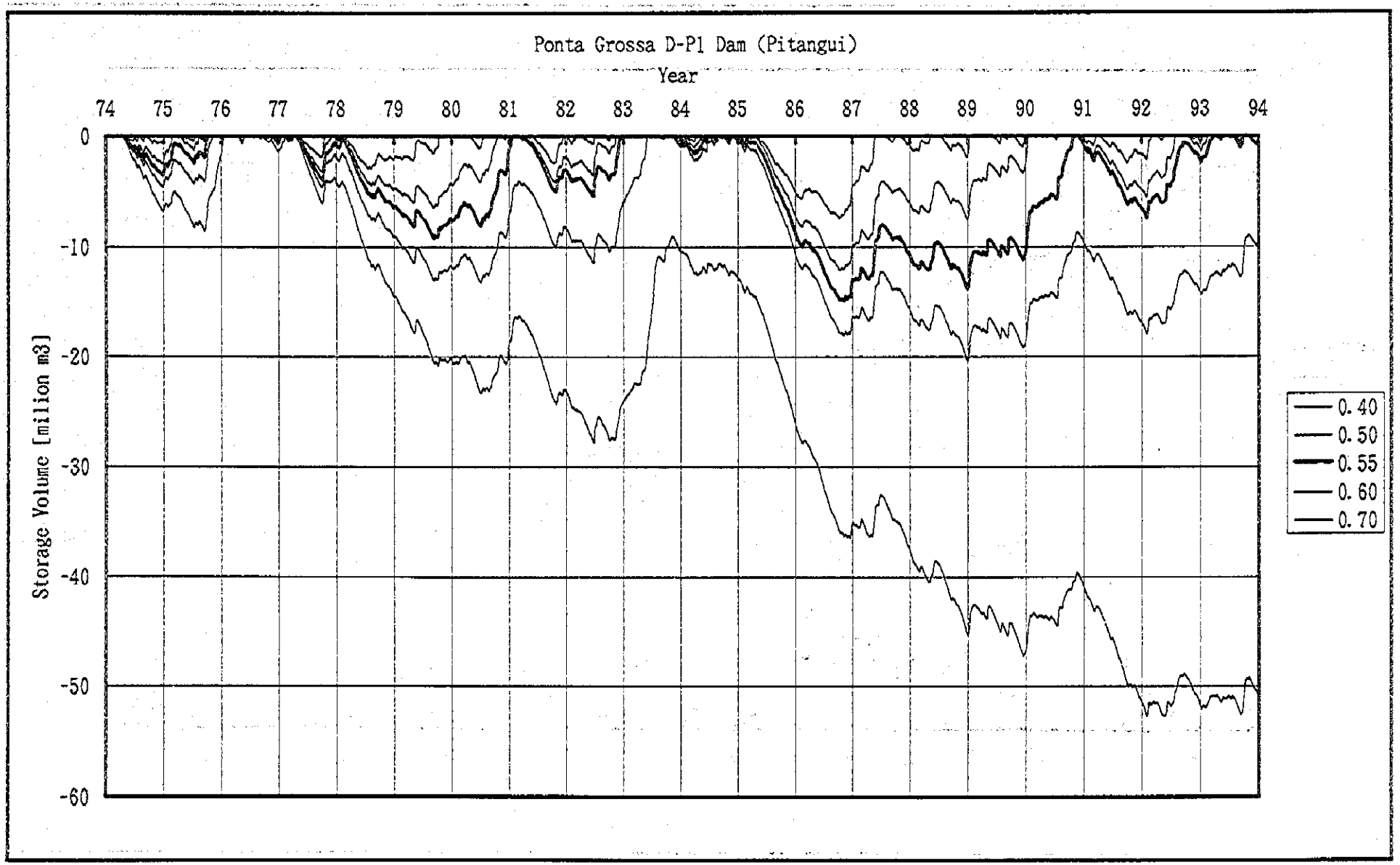

Cascavel D-C2 Dam (Tesouro)
Year
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
0
-5
-10
-15
-20
-25
-30
-35
Storage Volume [million m3]
0.25
0.30
0.35
0.40
0.45

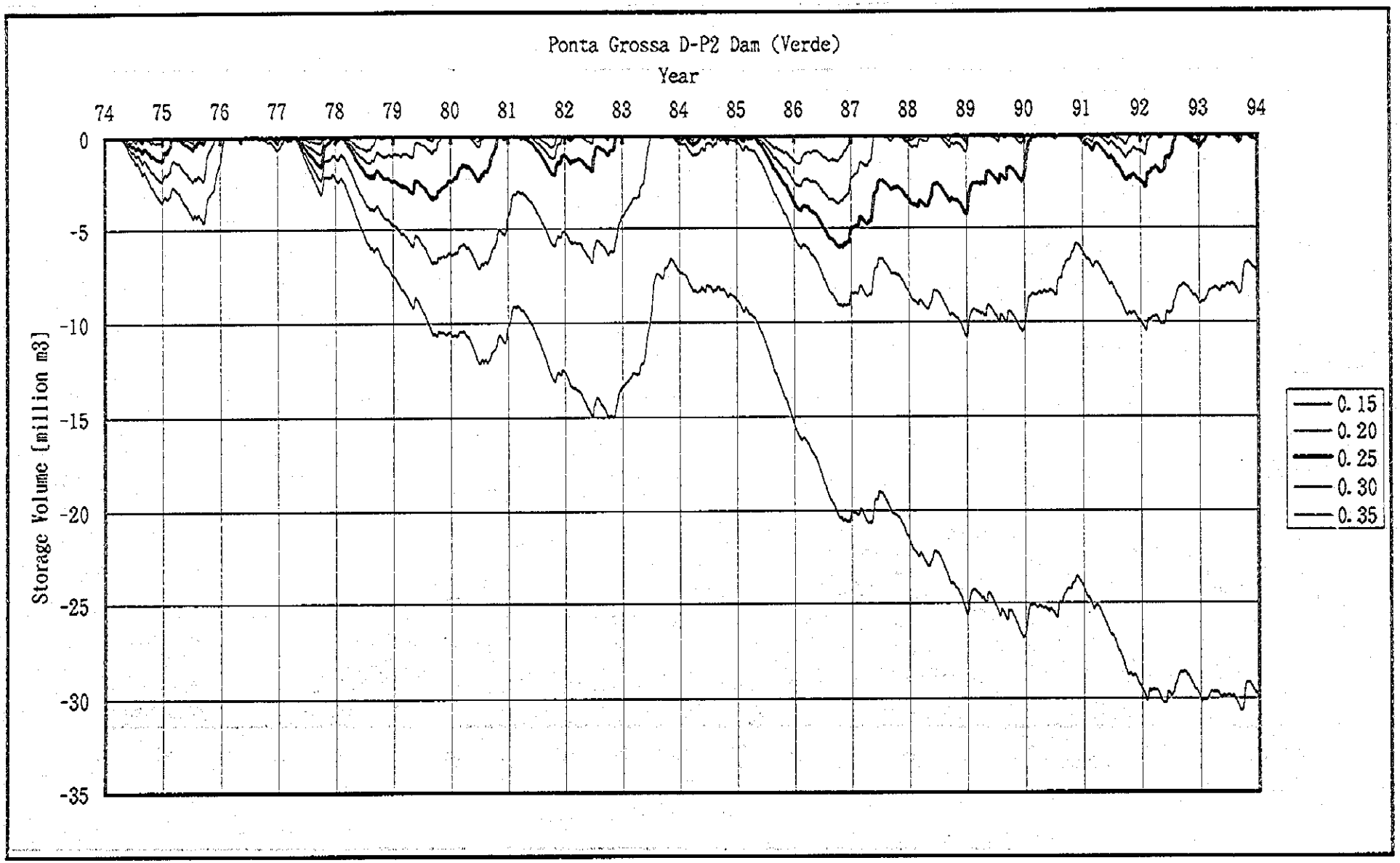

Cascavel D-C3 Dam (Barreiro)
Year
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
0
-10
-20
-30
-40
-50
-60
-70
Storage Volume (million m3)
1.10
1.20
1.30
1.40
1.50

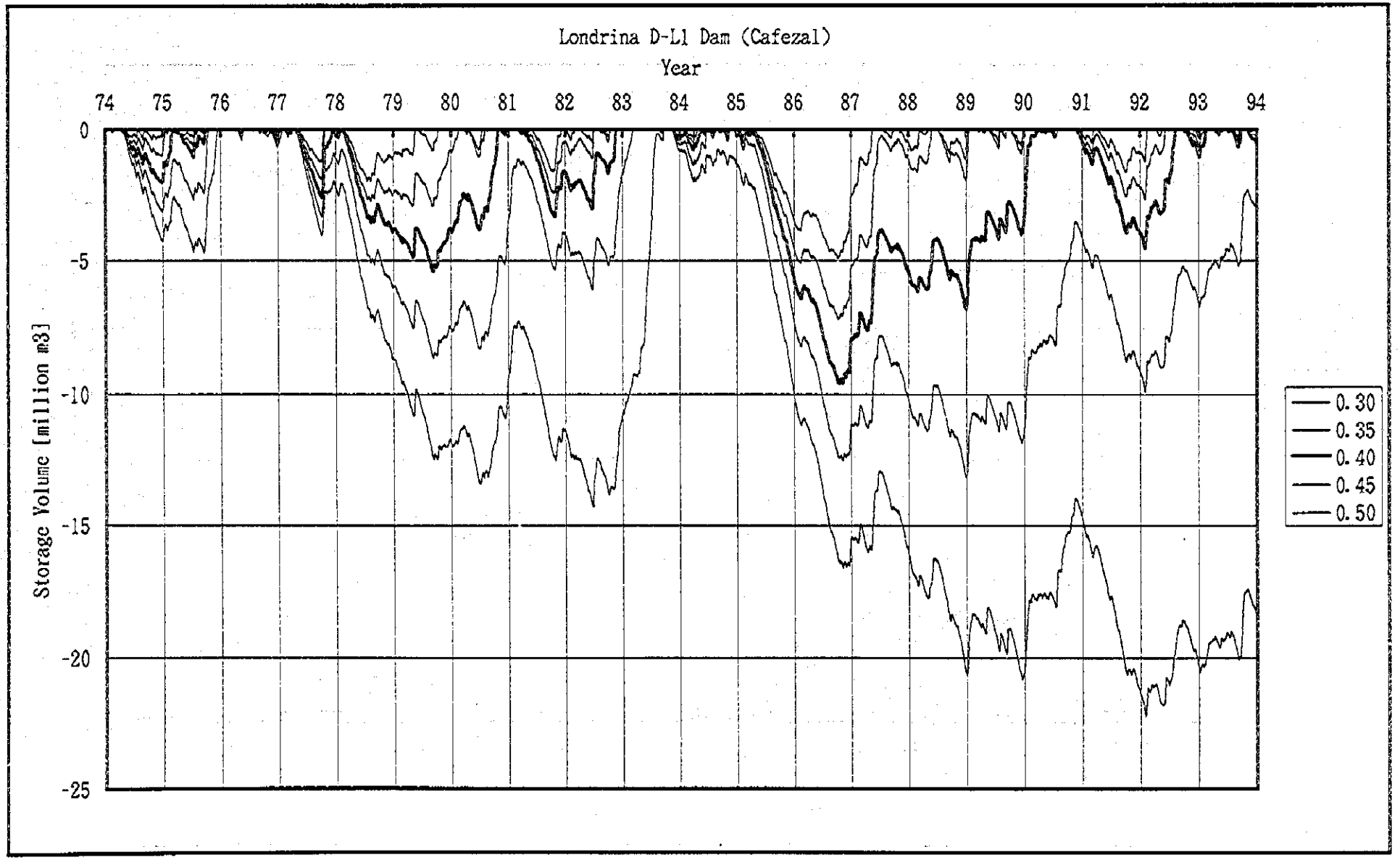

Cascavel D-C4 Dam (Aroeira)
Year
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
0
-10
-20
-30
-40
-50
-60
-70
Storage Volume [milion m3]
0.40
0.50
0.60
0.70
0.80

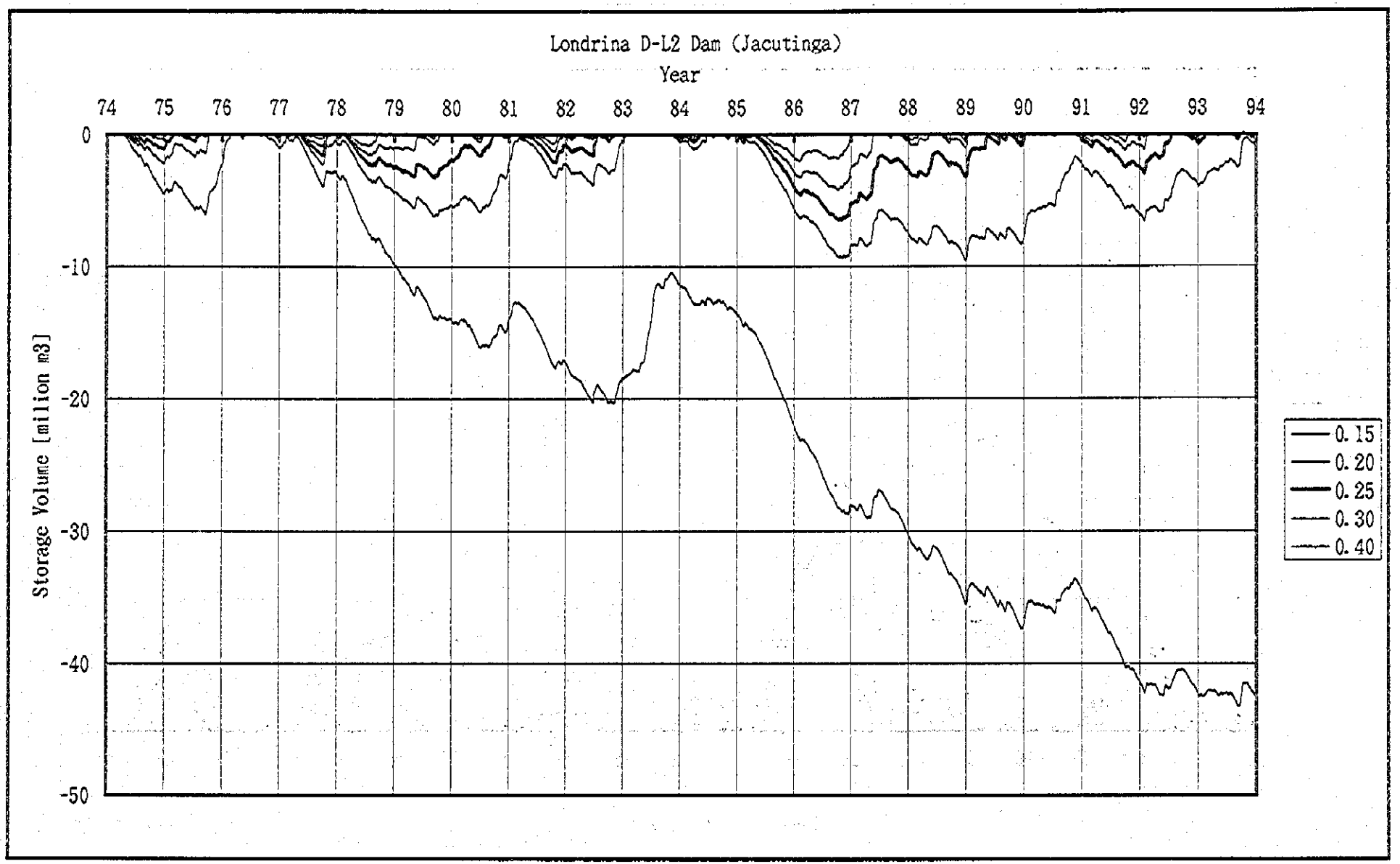

Cascavel D-C5 Dam (Antos)
Year
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
0
-10
-20
-30
-40
-50
-60
Storage Volume (million m3)
0.70
0.80
0.90
1.00
1.10

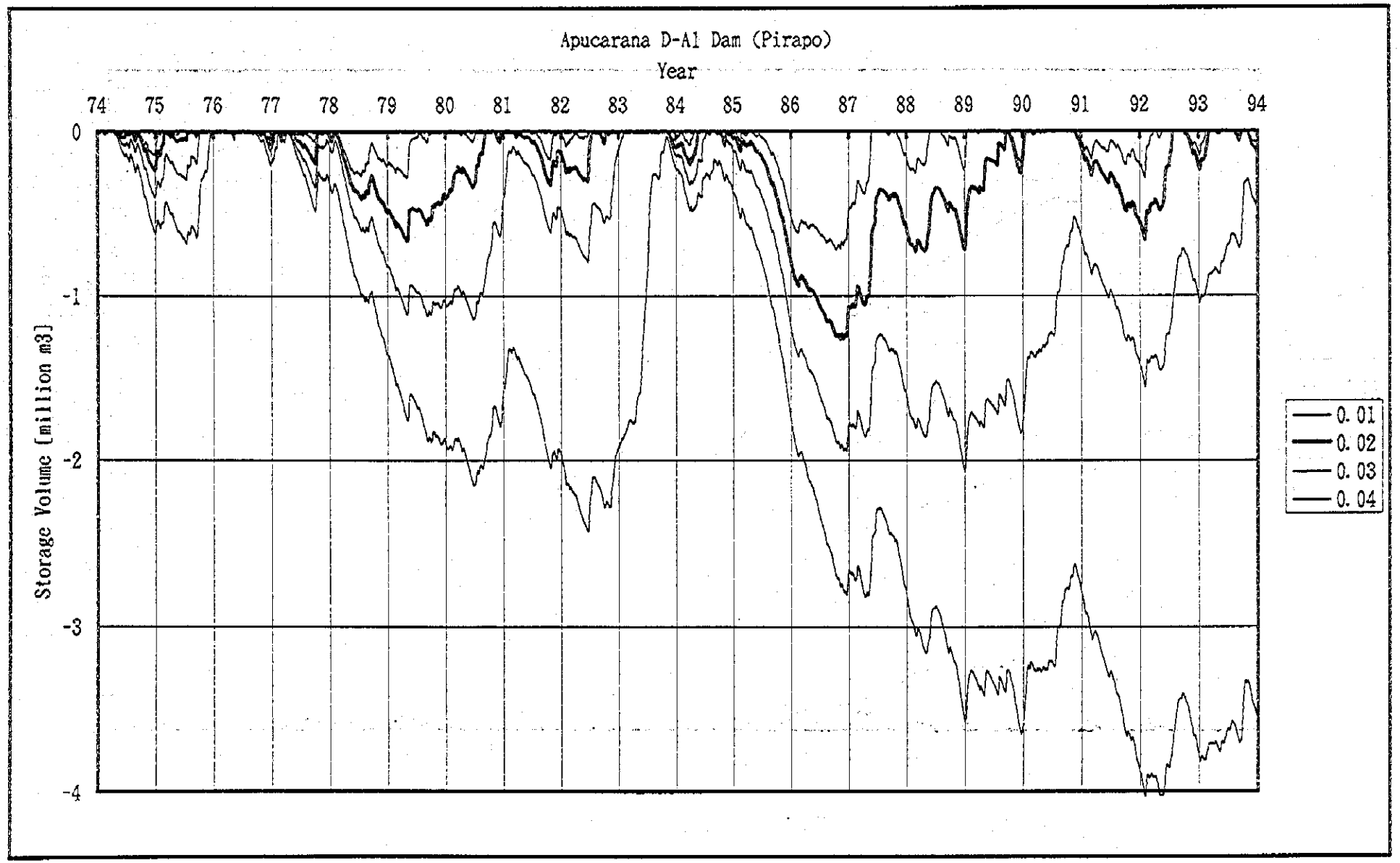

Cascavel D-C6 Dam (C.S.Salvador)
Year
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
0
-5
-10
-15
-20
-25
Storage Volume [milion m3]
0.10
0.15
0.20
0.25
0.30

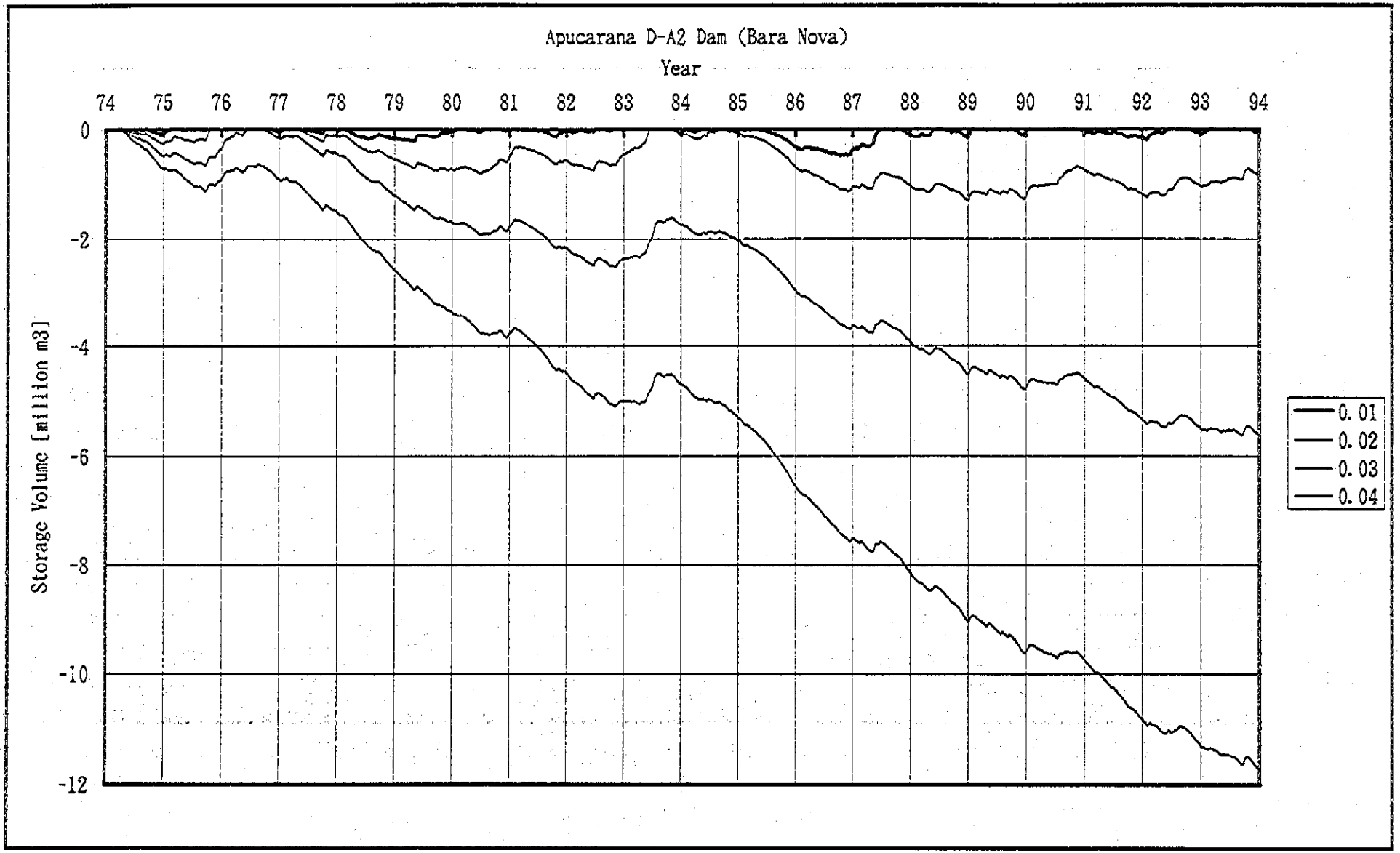

Ponta Grossa D-P1 Dam (Pitangui)
Year
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
0
-10
-20
-30
-40
-50
-60
Storage Volume [milion m3]
0.40
0.50
0.55
0.60
0.70

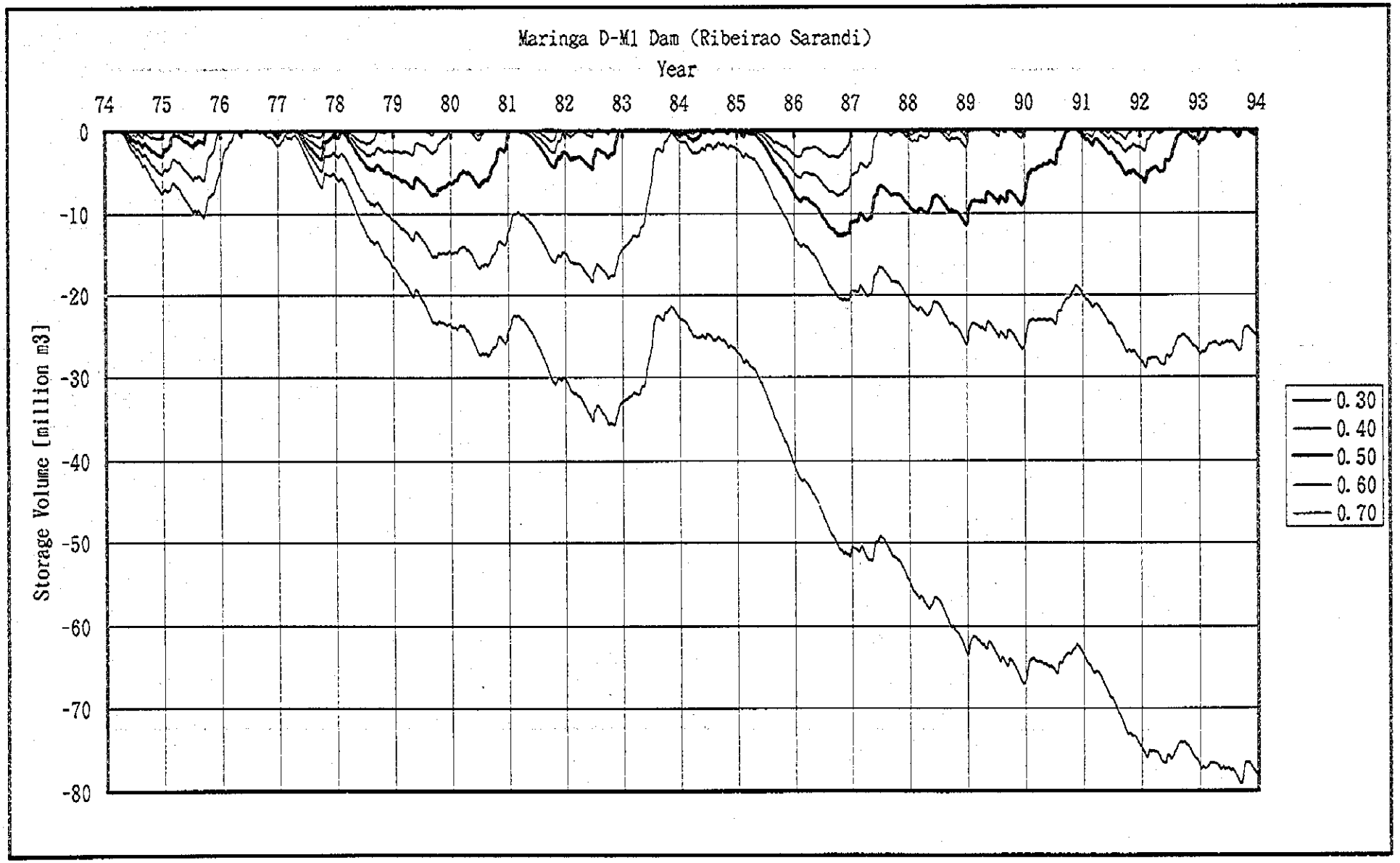

Ponta Grossa D-P2 Dam (Verde)
Year
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
0
-5
-10
-15
-20
-25
-30
-35
Storage Volume [million m3]
0.15
0.20
0.25
0.30
0.35

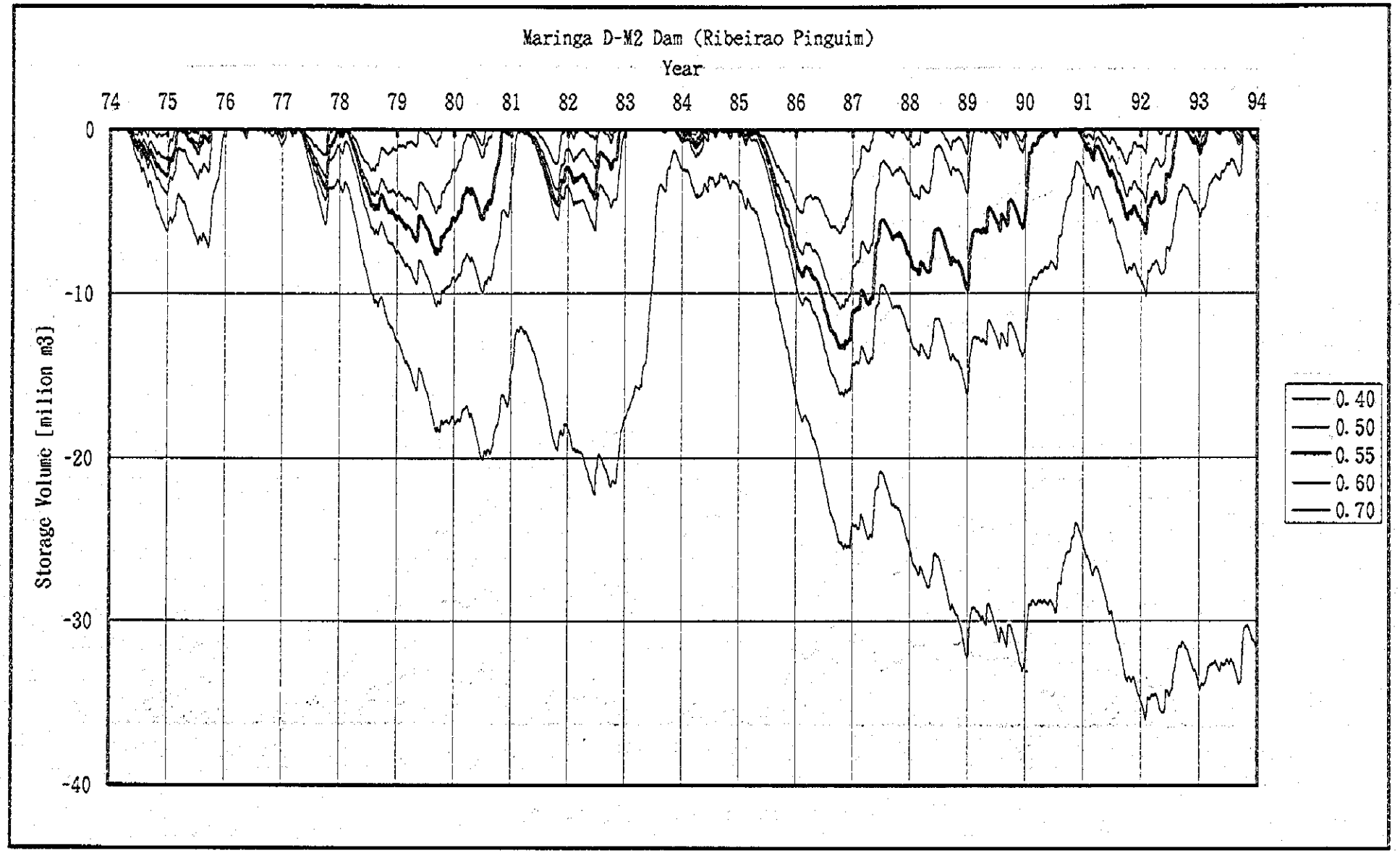

Londrina D-L1 Dam (Cafezal)
Year
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
0
-5
-10
-15
-20
-25
Storage Volume [million m3]
0.30
0.35
0.40
0.45
0.50

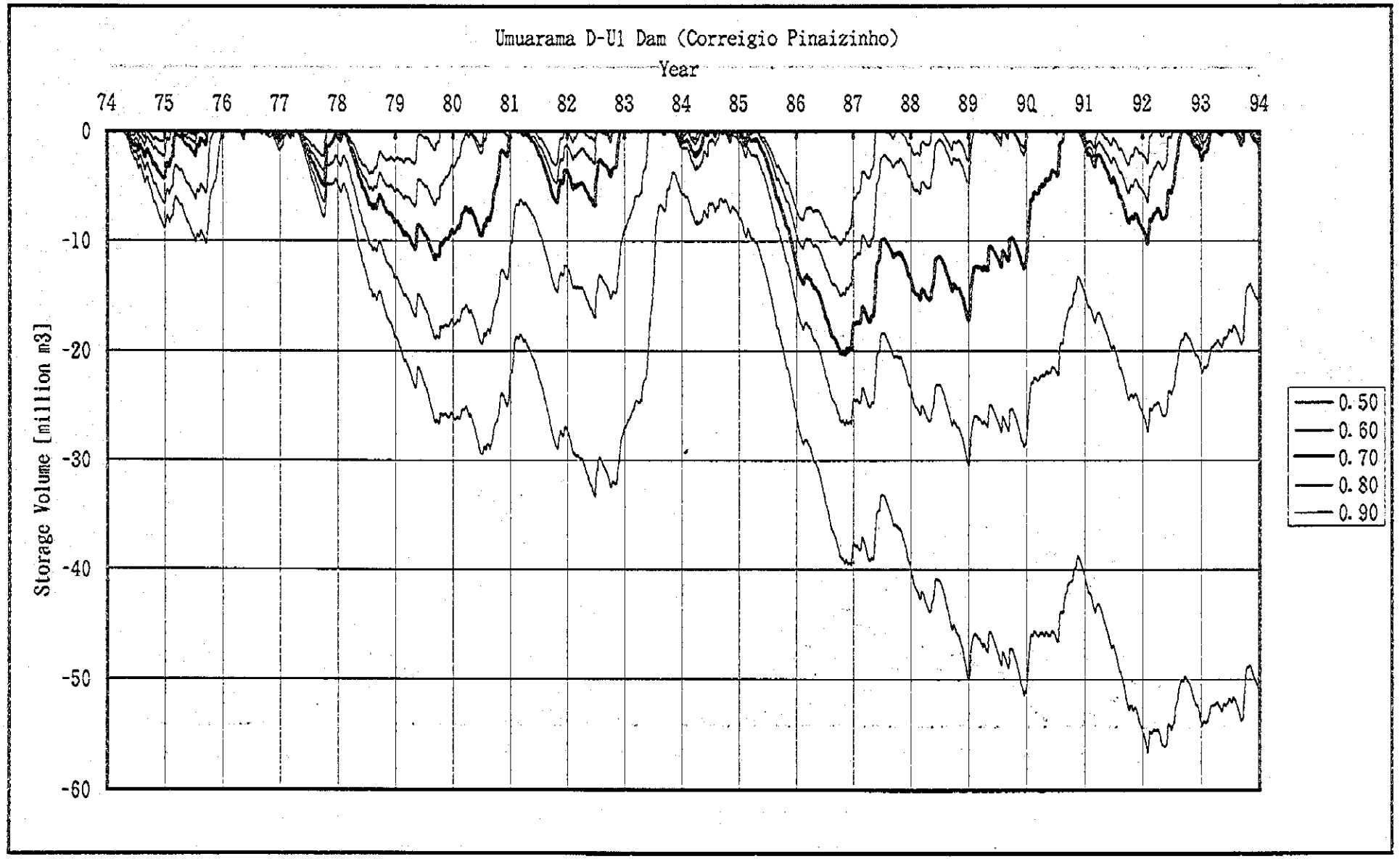

Londrina D-L2 Dam (Jacutinga)
Year
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
0
-10
-20
-30
-40
-50
Storage Volume [million m3]
0.15
0.20
0.25
0.30
0.40

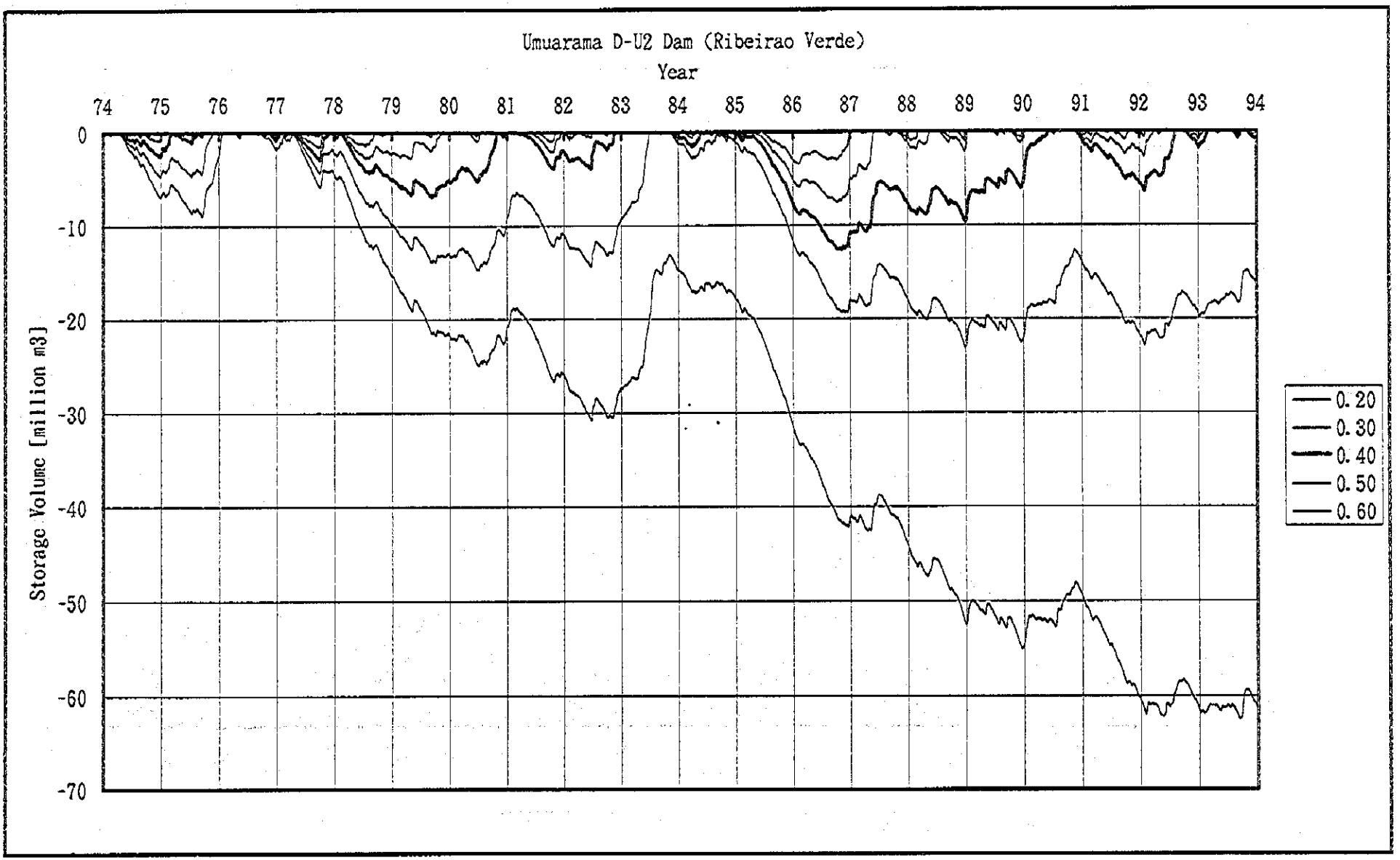

Apucarana D-A1 Dam (Pirapo)
Year
74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94
0
-1
-2
-3
-4
Storage Volume [million m3]
0.01
0.02
0.03
0.04


Apucarana D-A2 Dam (Bara Nova)
Year
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
0
-2
-4
-6
-8
-10
-12
Storage Volume [million m3]
0.01
0.02
0.03
0.04


Maringa D-M1 Dam (Ribeirao Sarandi)
Year
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
0
-10
-20
-30
-40
-50
-60
-70
-80
Storage Volume [million m3]
0.30
0.40
0.50
0.60
0.70

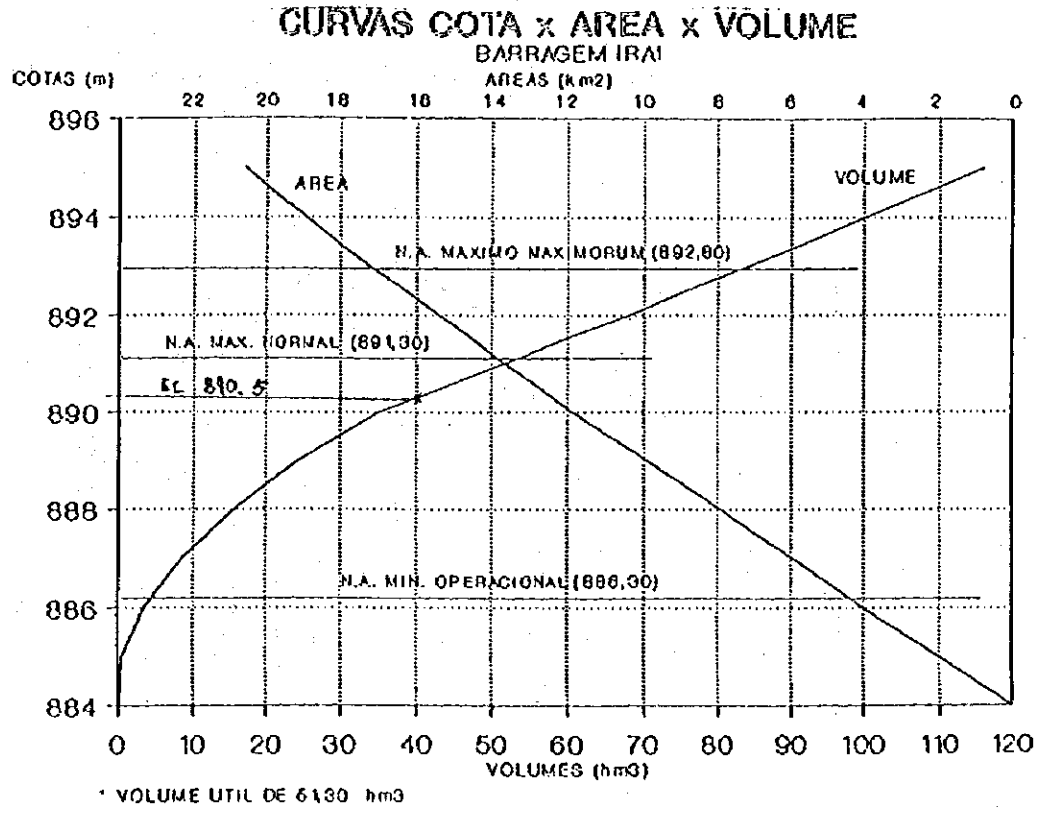

Maringa D-M2 Dam (Ribeirao Pinguim)
Year
74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94
0
-10
-20
-30
-40
Storage Volume [million m3]
0.40
0.50
0.55
0.60
0.70


Umuarama D-U1 Dam (Correigio Pinaizinho)
Year
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
0
-10
-20
-30
-40
-50
-60
Storage Volume [million m3]
0.50
0.60
0.70
0.80
0.90

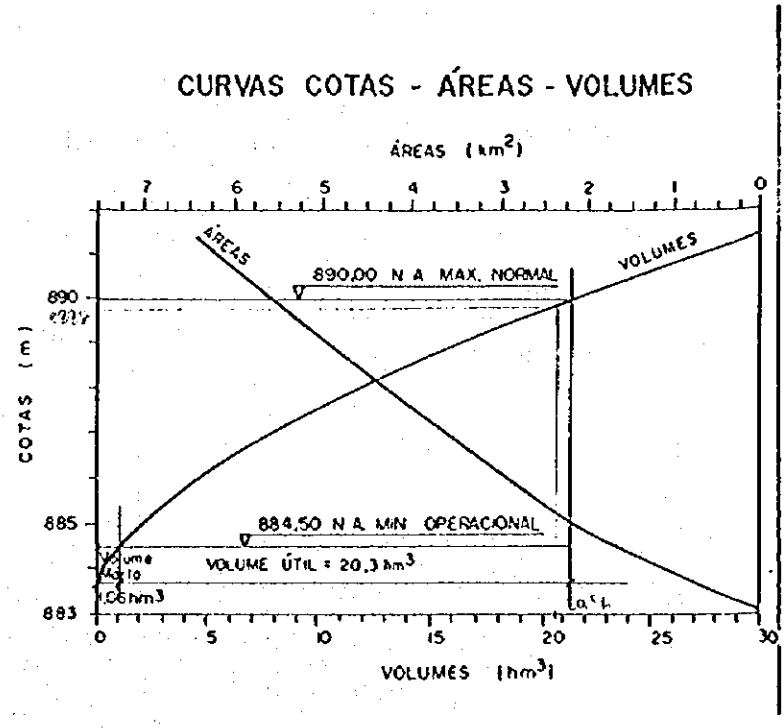

Umuarama D-U2 Dam (Ribeirao Verde)
Year
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
0
-10
-20
-30
-40
-50
-60
-70
Storage Volume [million m3]
0.20
0.30
0.40
0.50
0.60

II-3 Storage Capacity Curve

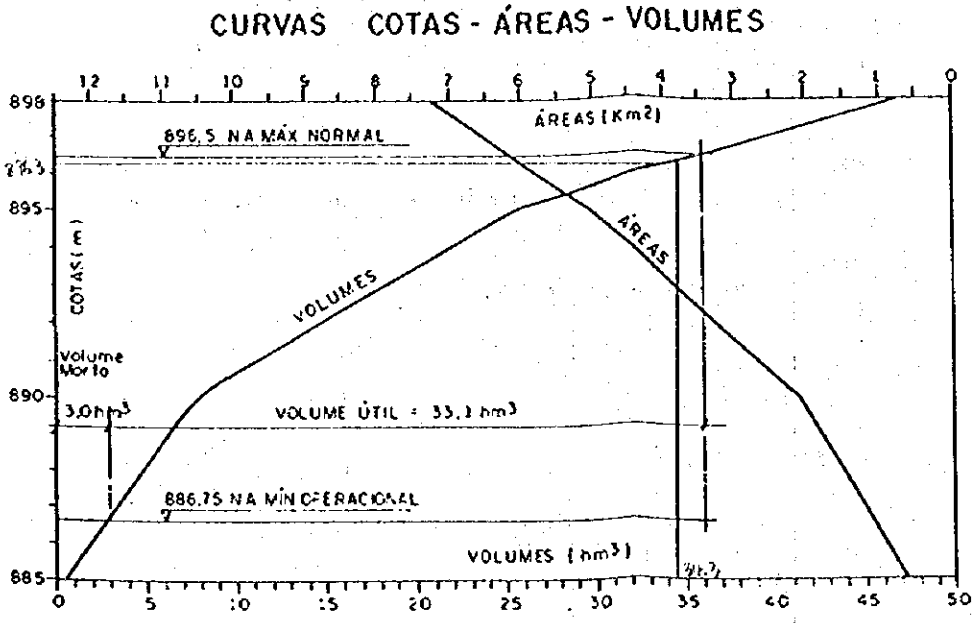
1. Irai



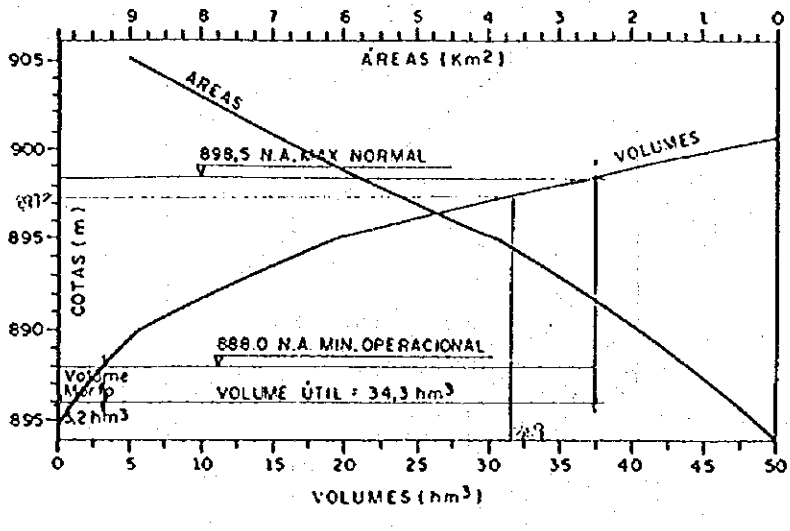
2. Piraquara II



3. Pequeno

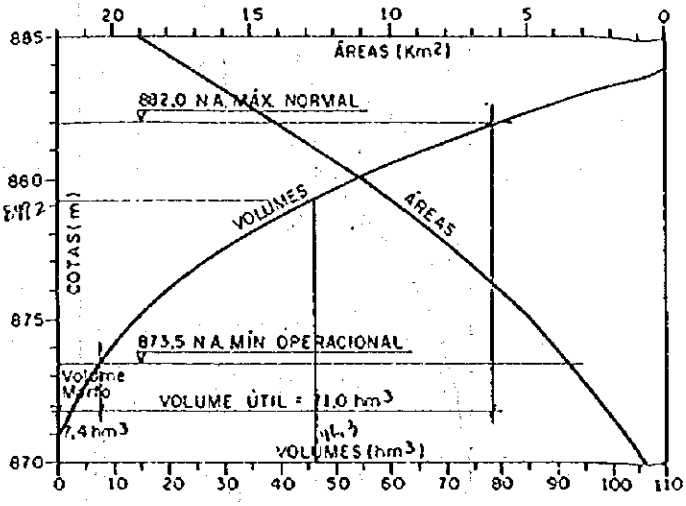


4. Alto Miringuava



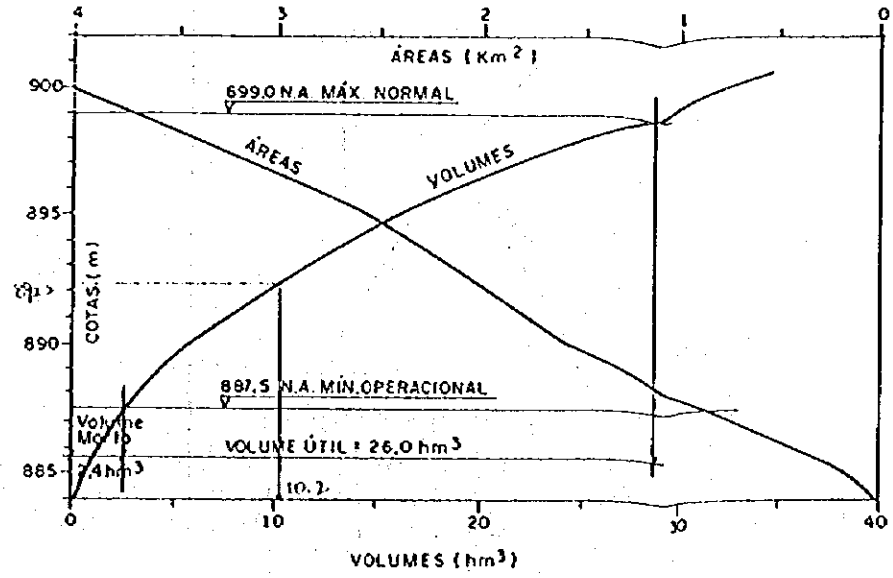
5. Cotia Desplque

CURVAS COTAS - ÁREAS - VOLUMES



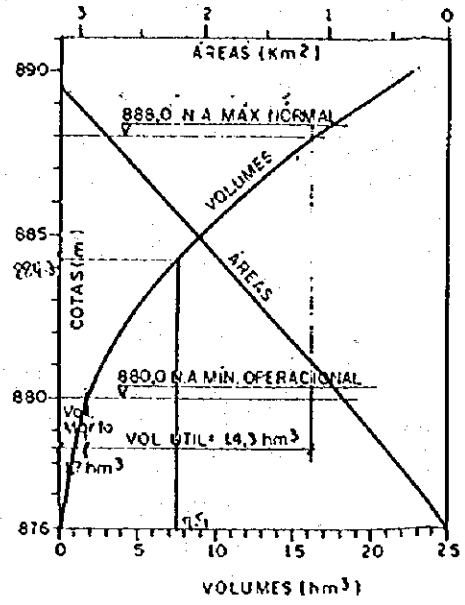
6. Alto Mauricio

CURVAS COTAS - ÁREAS - VOLUMES



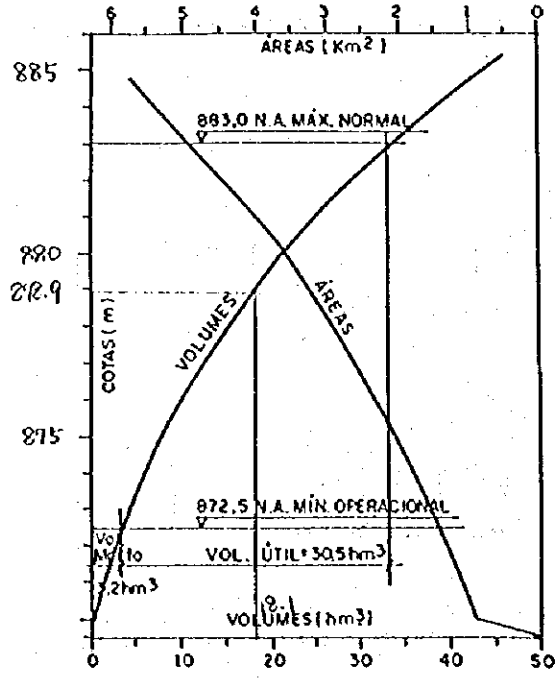
7. Das Onças (Mandirituba)

CURVAS COTAS - ÁREAS - VOLUMES



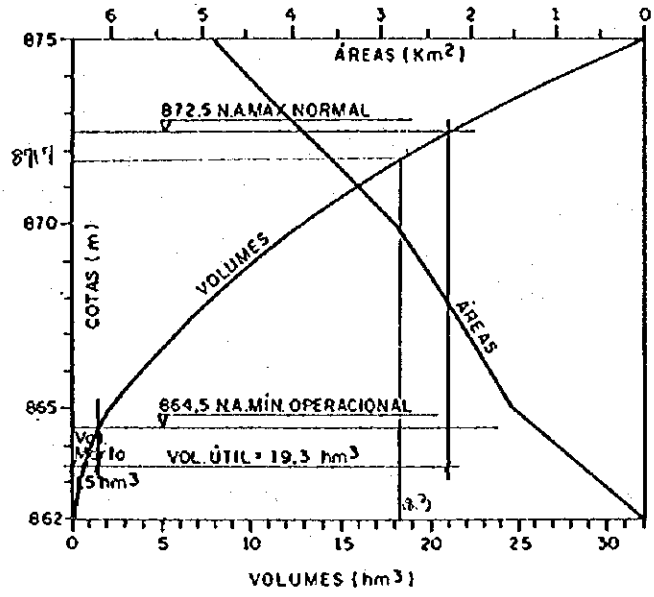
8. Faxinal

CURVAS COTAS - ÁREAS - VOLUMES



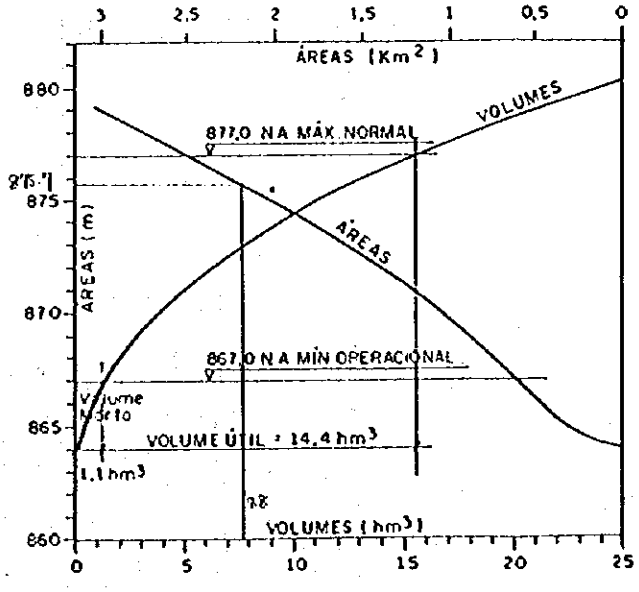
9. Das Onças (Contenda)

CURVAS COTAS - ÁREAS - VOLUMES

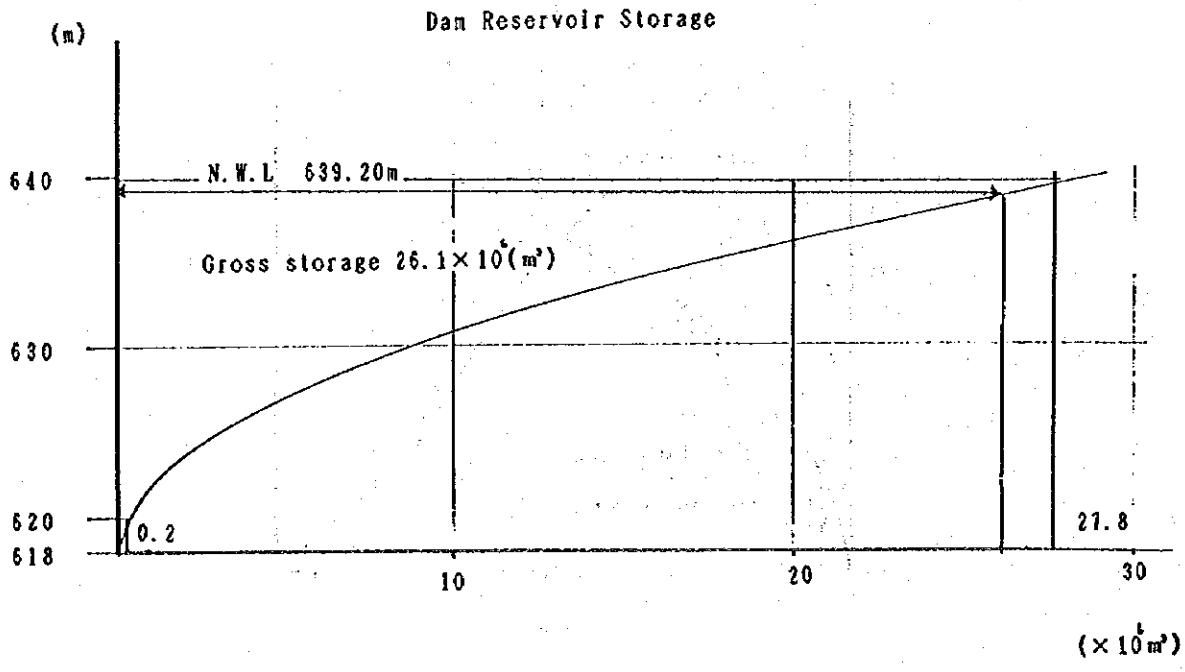


10. Piunduva

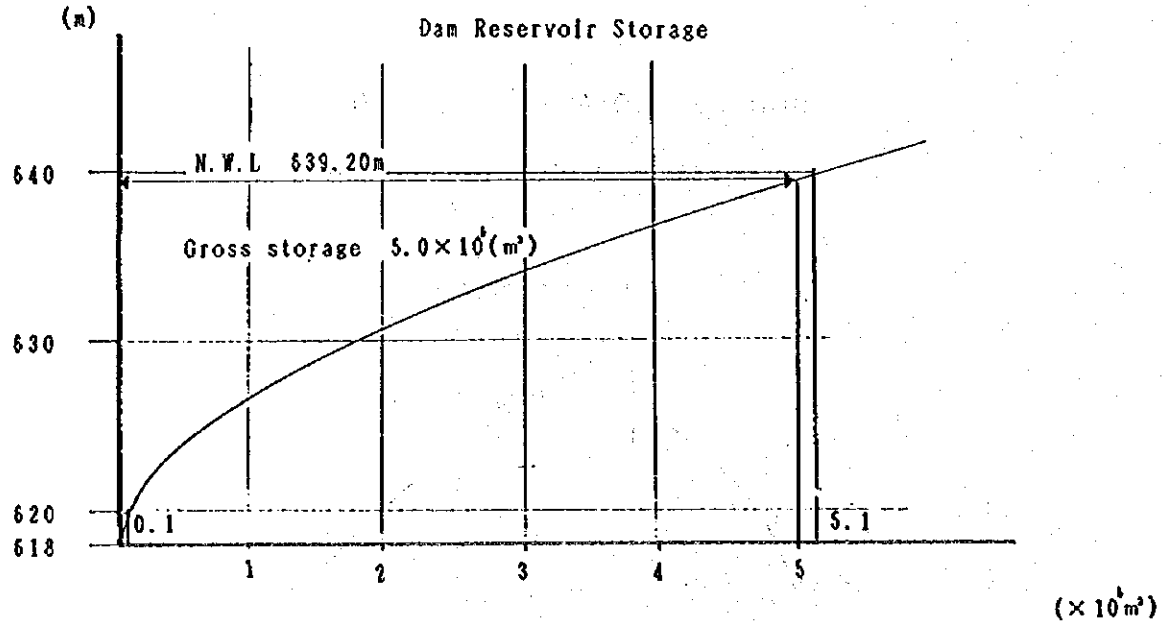
CURVAS COTAS - ÁREAS - VOLUMES



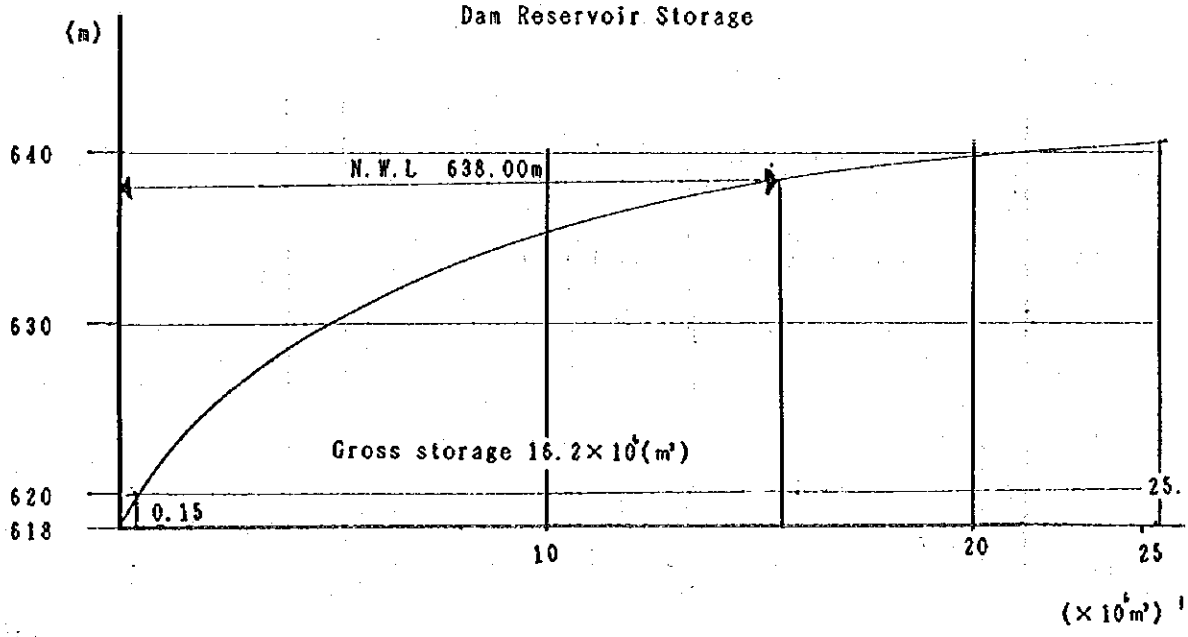
C. Antos Dam



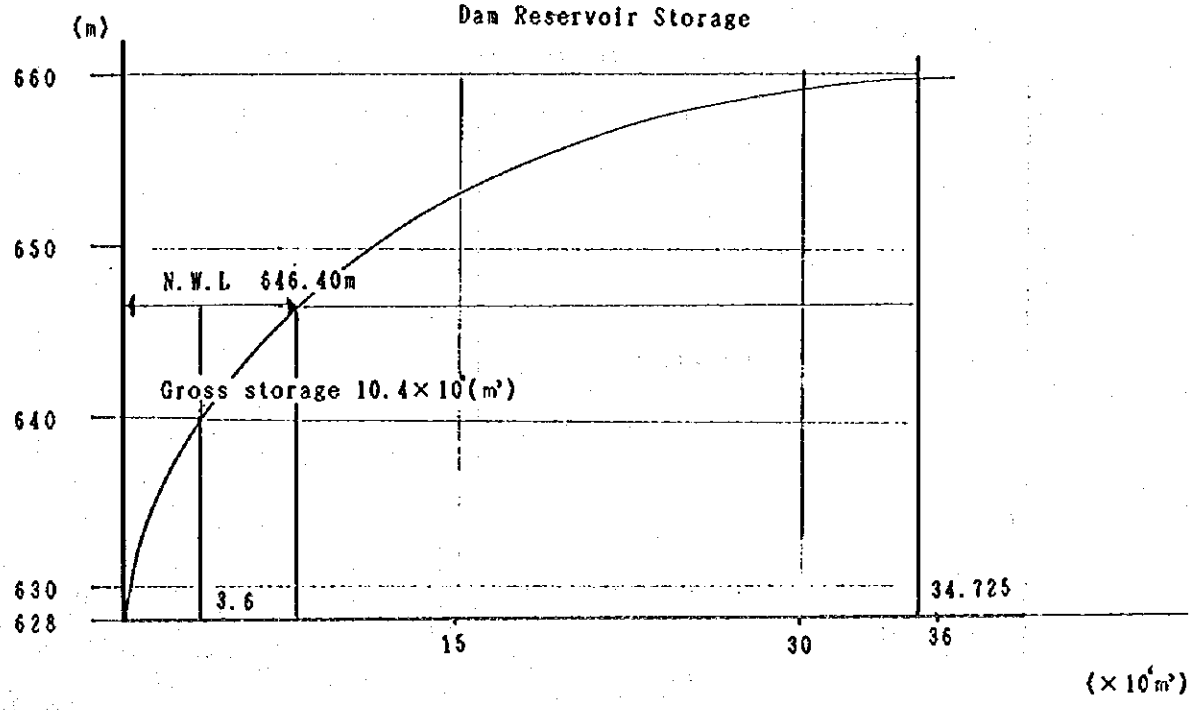
C. C.S Salvador Dam



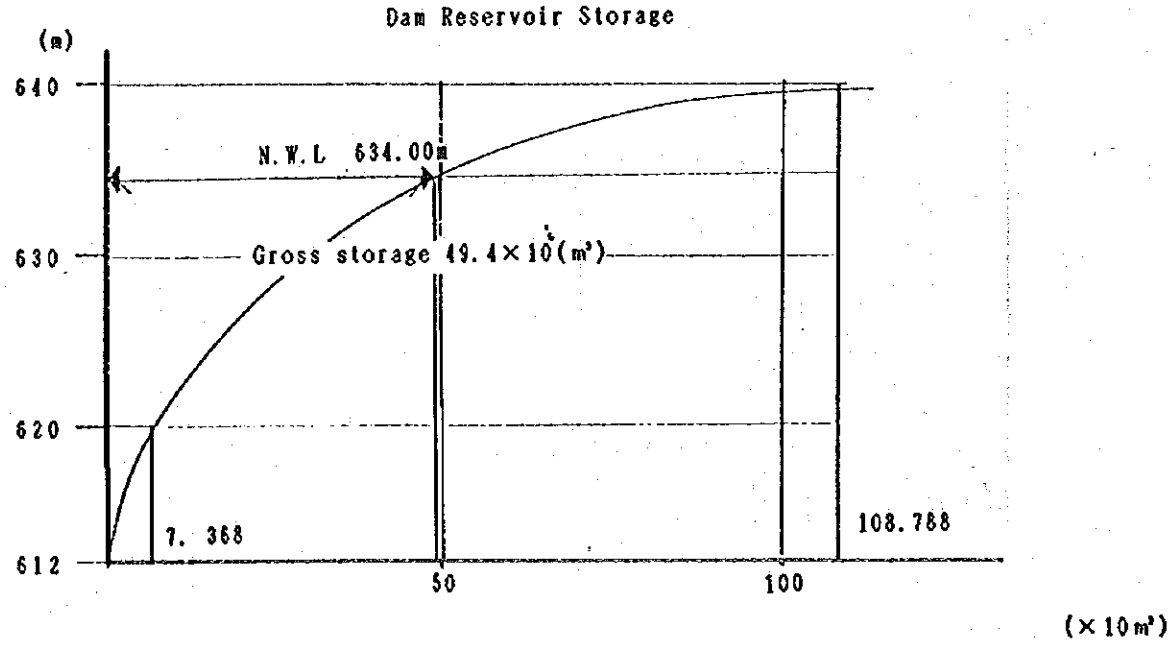
C. Bameiro Dam



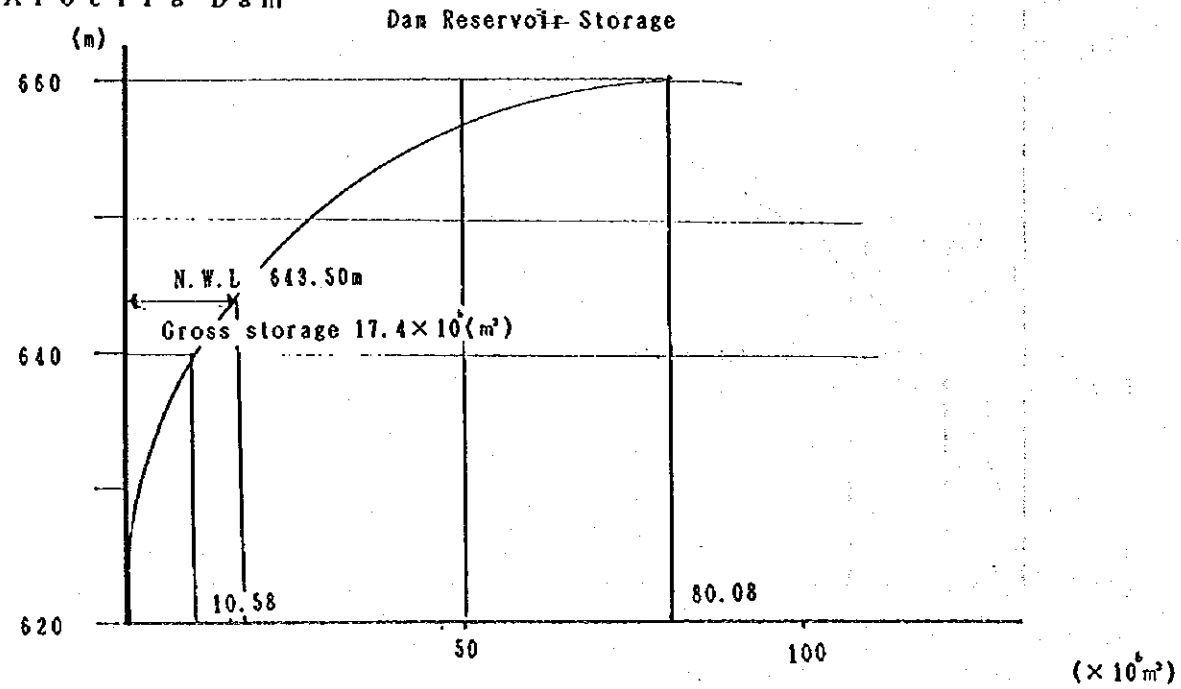
C. Tesouro Dam



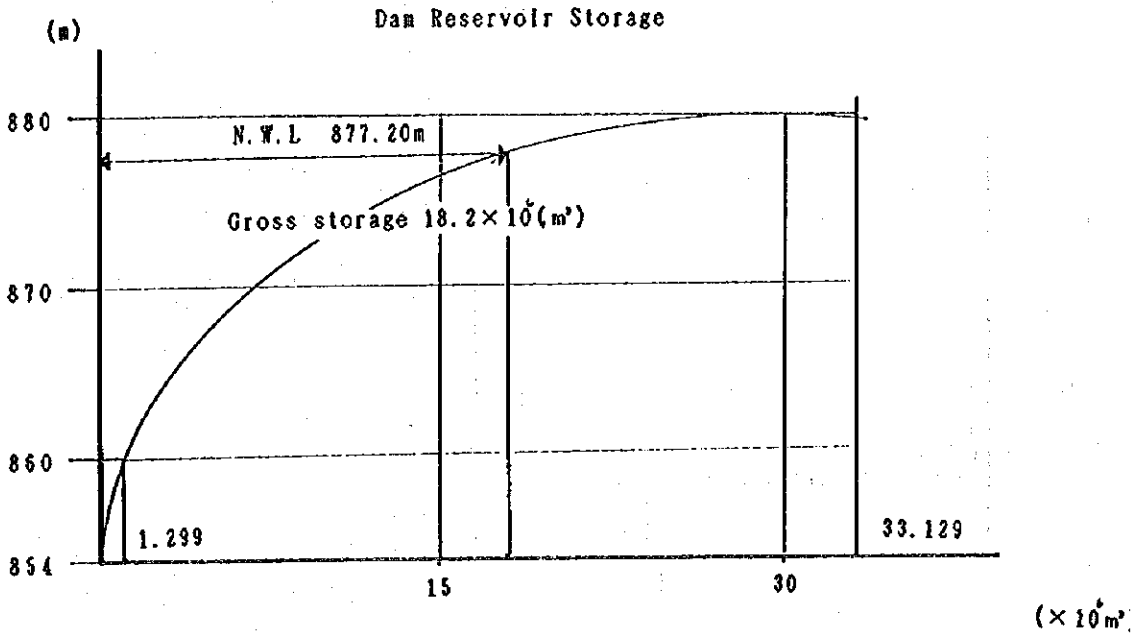
C. Bameiro Dam



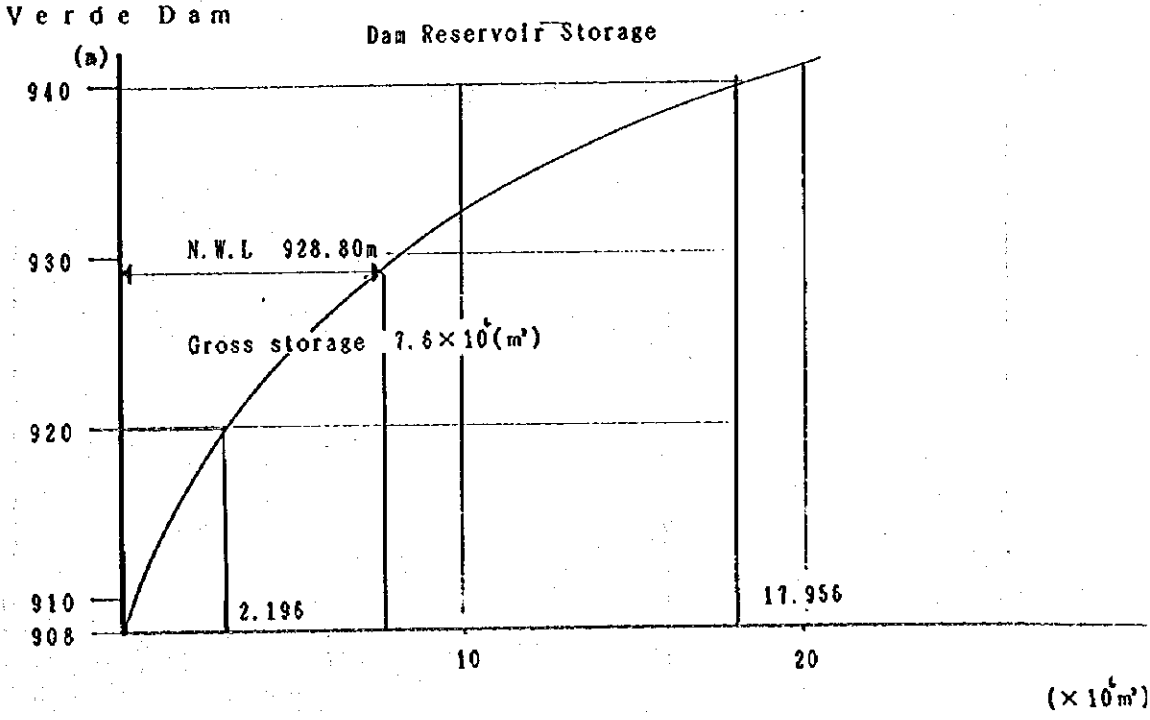
. Aroeira Dam



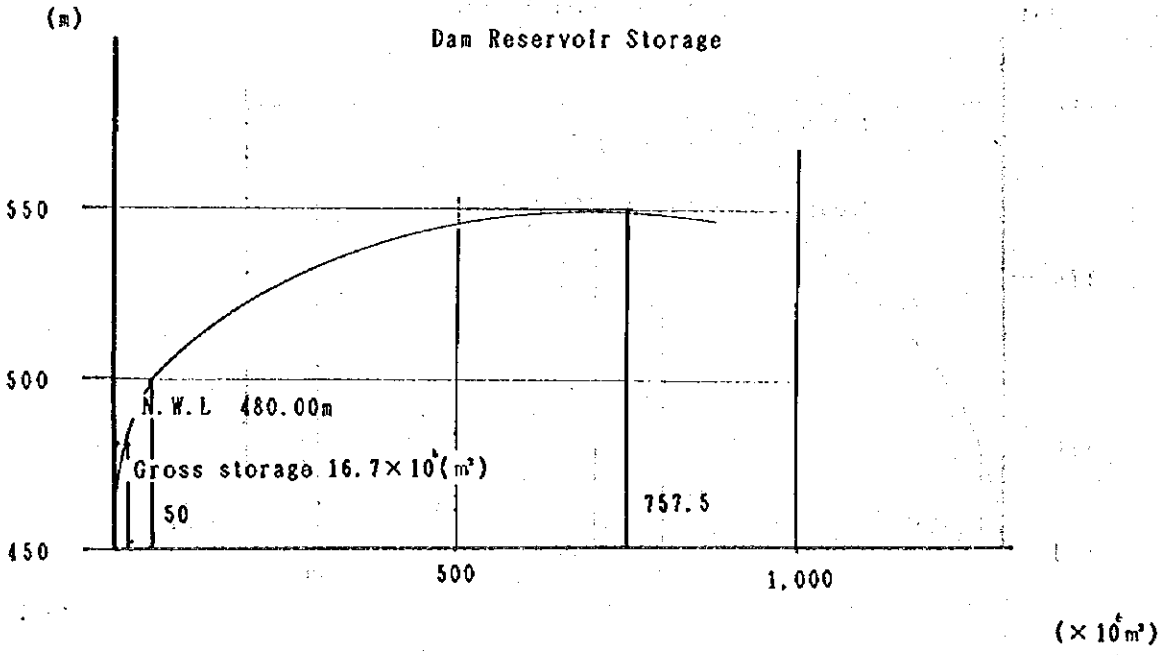
P. Pitangui Dam



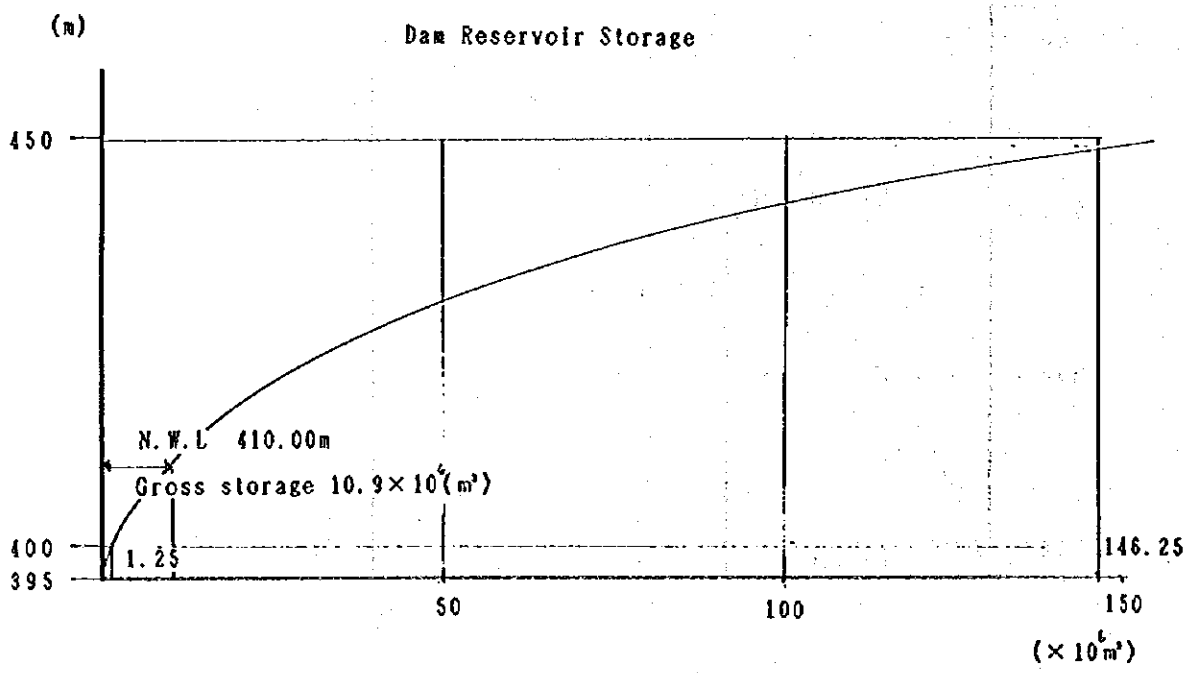
P. Verde Dam



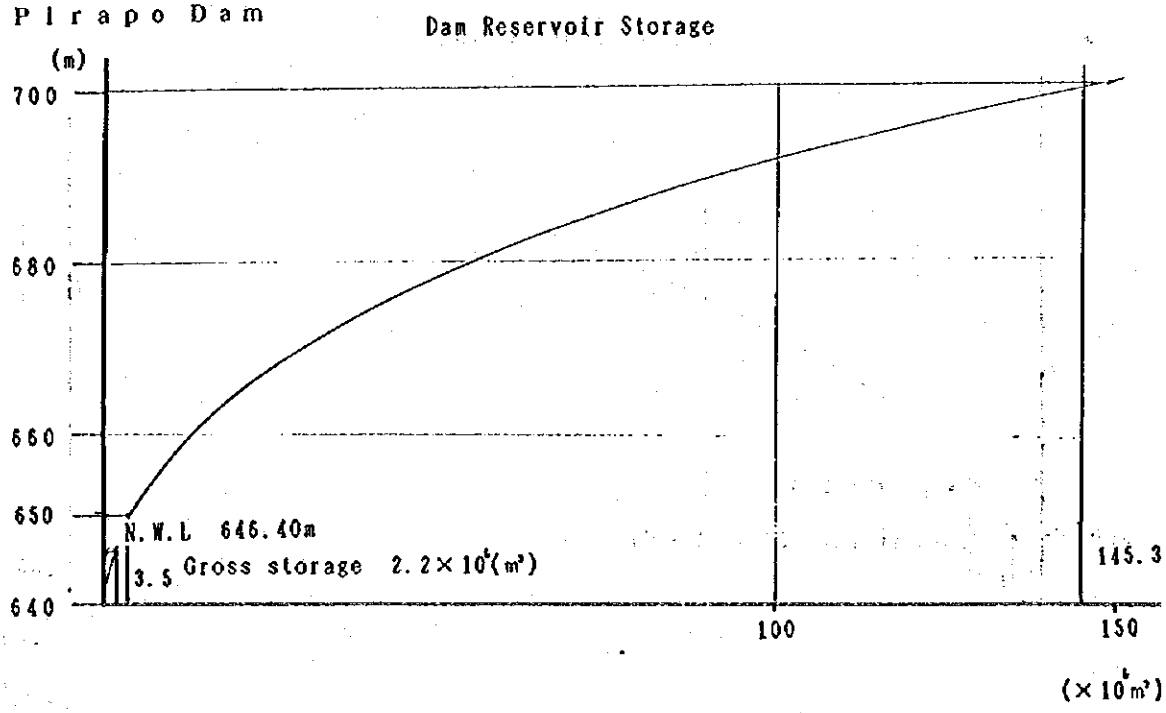
Cafezal Dam



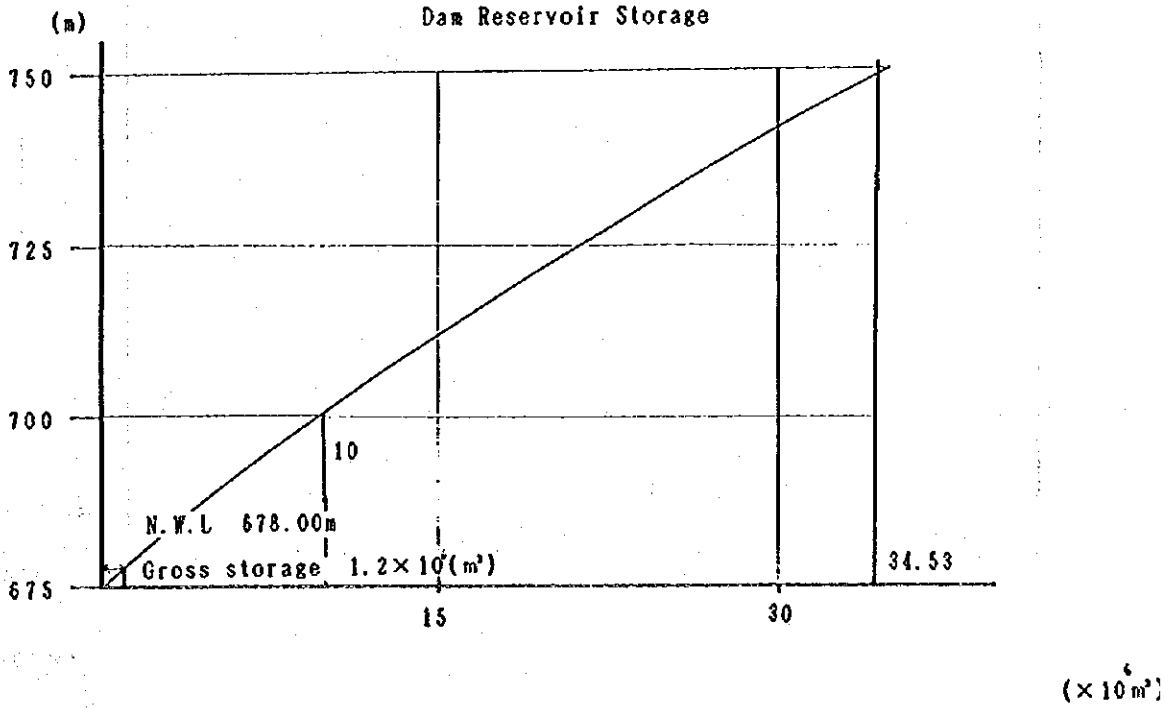
Jacutinga Dam



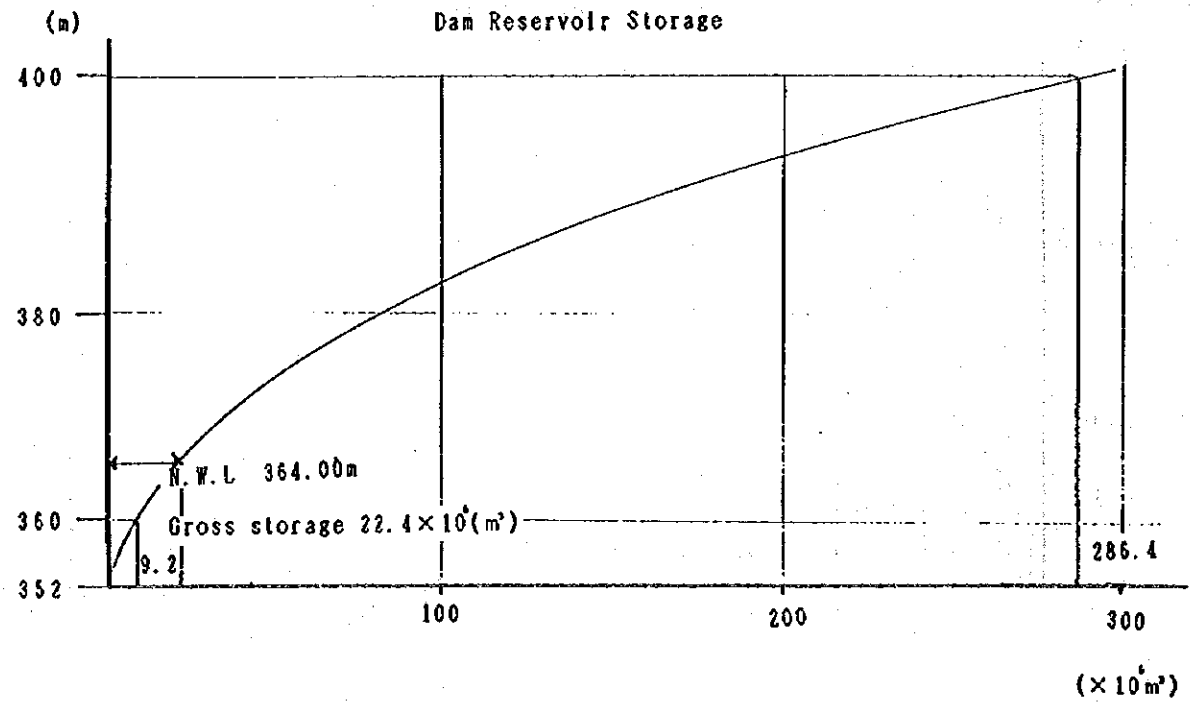
A. Pirapo Dam



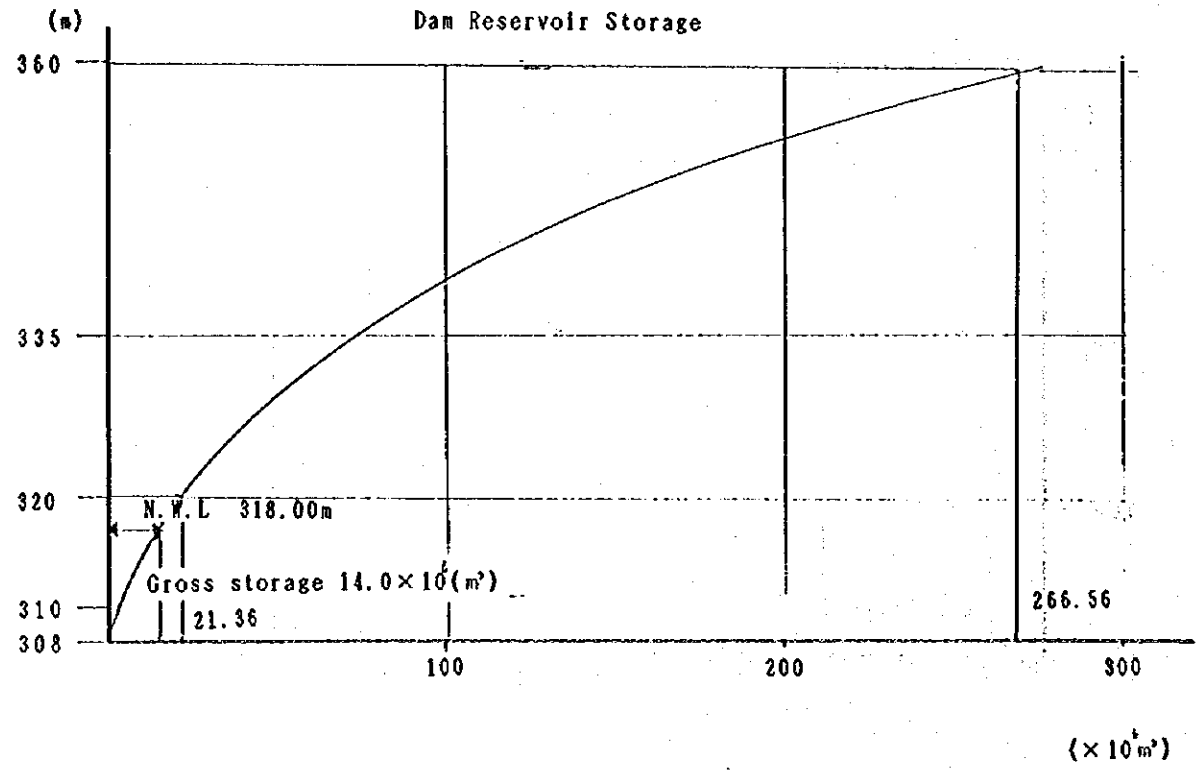
A. Bara Nova Dam



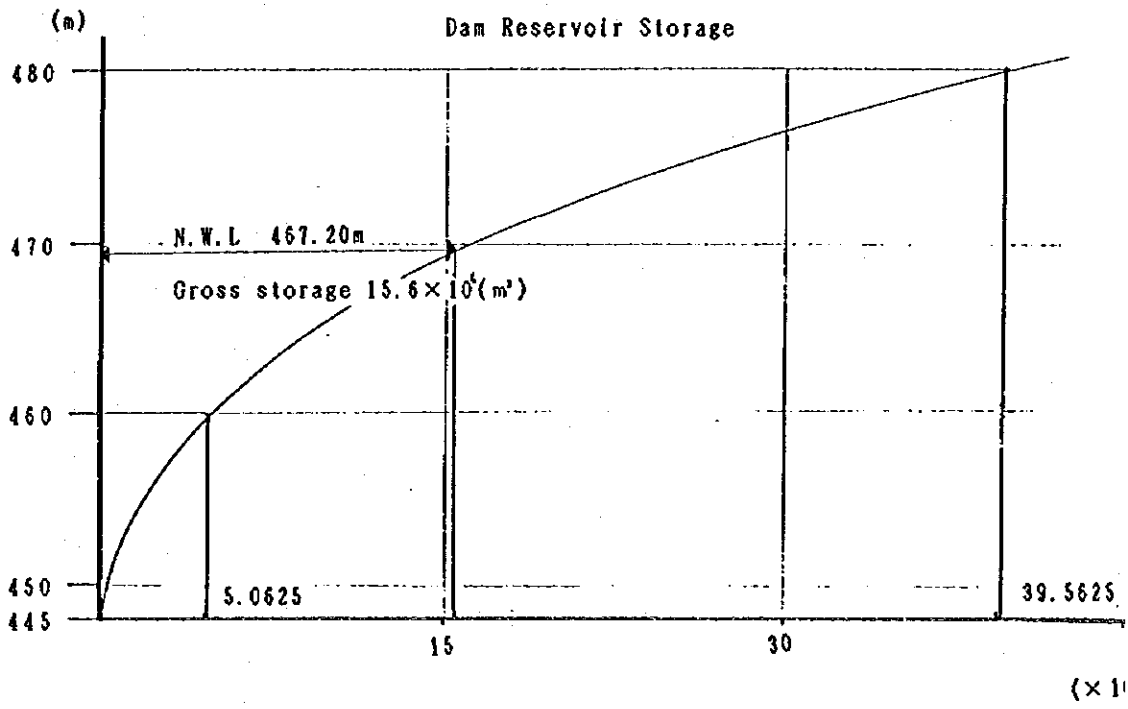
. Comegio Pinaizinho Dam



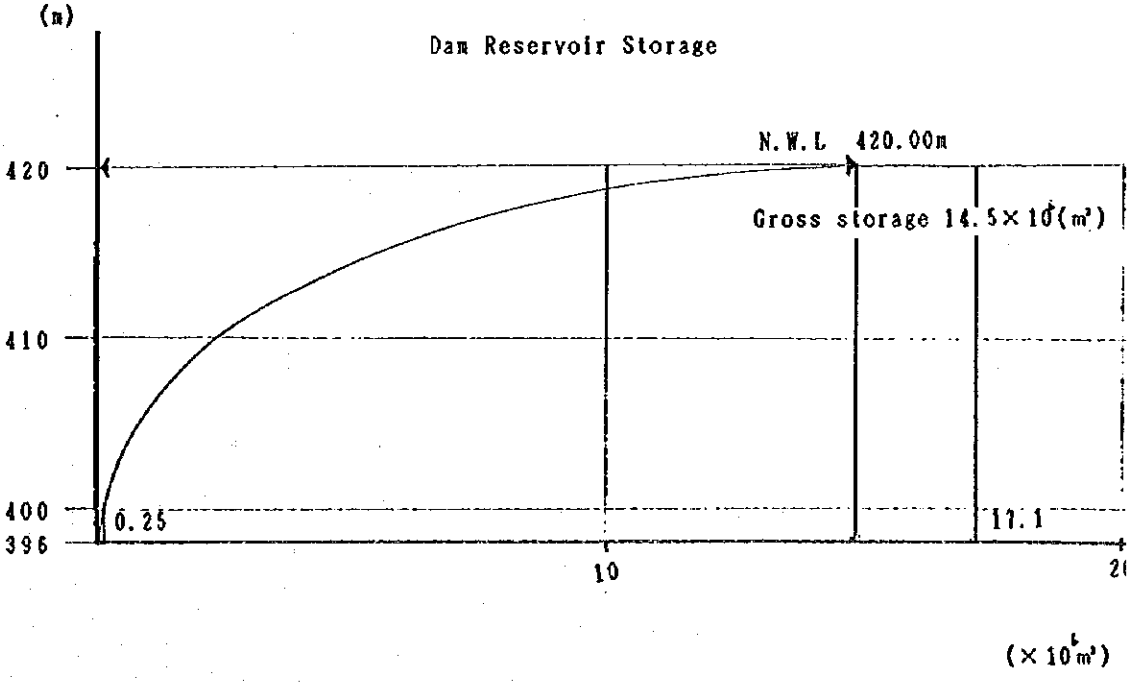
I. Riberao Verde Dam



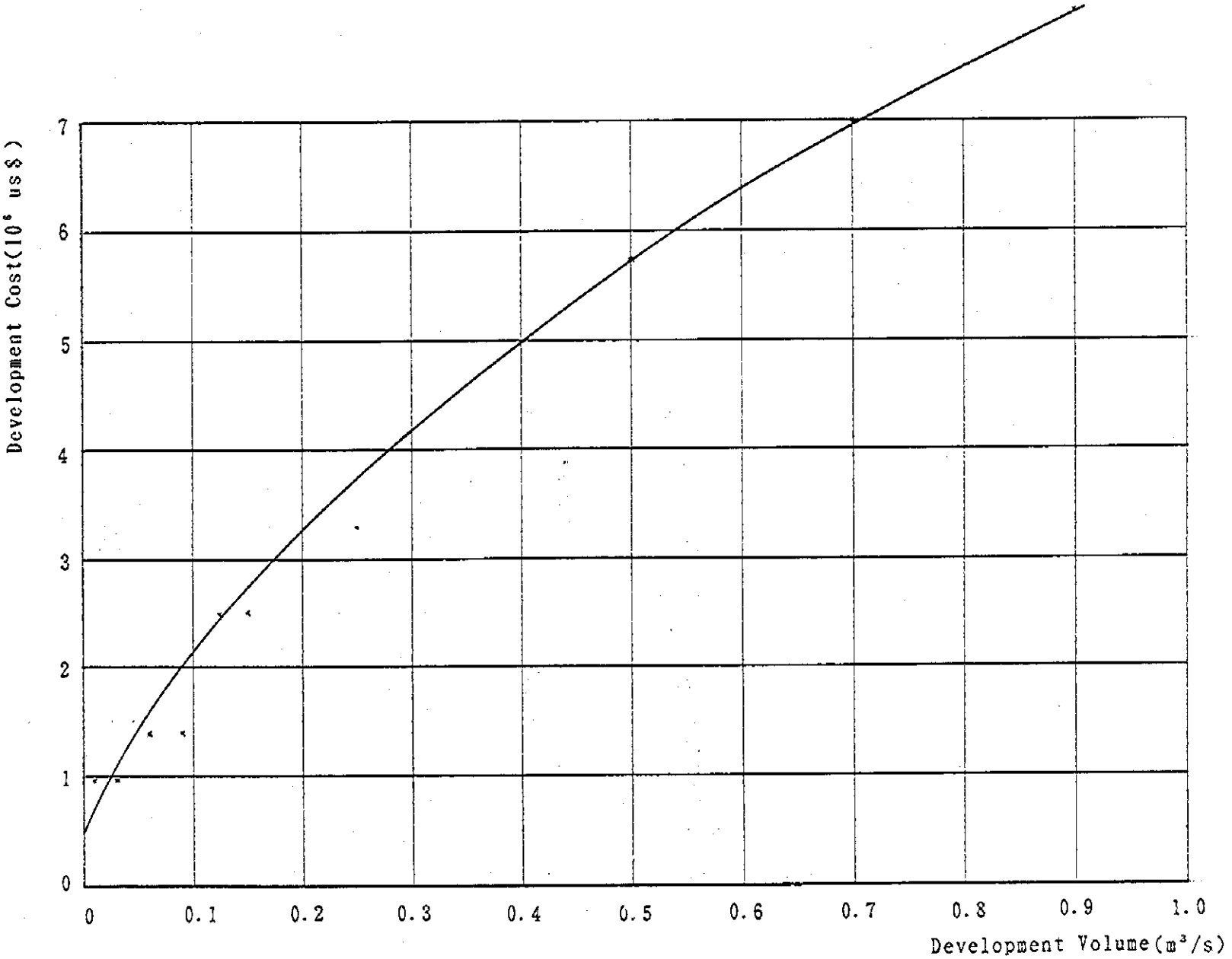
M. Ribeirao Sarandi Dam



M. Ribeirao Pinguim Dam



II-4 Cost Estimation of Other Urban Area


Development Cost(10⁶ us$)
7
6
5
4
3
2
1
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Development Volume(m³/s)

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial

MRH Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
MRH-268	0.369	0.713	0.344	10.15
MRH-269	0.376	0.585	0.209	6.26
MRH-270	0.033	0.055	0.022	1.86
MRH-271	0.034	0.074	0.040	2.66
MRH-272	0.243	0.424	0.181	5.50
MRH-273	0.486	0.848	0.362	7.98
MRH-274	0.206	0.729	0.523	8.81
MRH-275	0.067	0.110	0.043	2.22
MRH-276	0.246	0.408	0.162	6.17
MRH-277	0.090	0.140	0.050	3.34
MRH-278	0.258	0.427	0.169	11.79
MRH-279	0.676	1.065	0.389	16.43
MRH-280	0.149	0.210	0.061	5.02
MRH-281	1.071	1.874	0.803	27.70
MRH-282	0.550	1.103	0.553	16.01
MRH-283	0.556	0.870	0.314	20.30
MRH-284	0.390	0.658	0.268	14.93
MRH-285	0.519	0.805	0.286	19.25
MRH-286	0.713	1.219	0.506	19.51
MRH-287	0.127	0.313	0.186	7.06
MRH-288	1.947	4.172	2.225	52.00
MRH-289	0.815	1.485	0.670	27.63
MRH-290	0.700	1.358	0.658	13.97
MRH-291	0.394	0.676	0.282	10.16
Total	11.015	20.321	9.306	316.71

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-268

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Mandirituba	0.039	0.076	0.037	1.11
Rio Blanco do Sul	0.094	0.182	0.088	1.95
Bocaiuva do Sul	0.011	0.021	0.010	0.67
Campinha Grande do Sul	0.110	0.213	0.103	2.18
Quatro Barras	0.054	0.103	0.049	1.31
Contenda	0.021	0.040	0.019	0.81
Balsa Nova	0.013	0.026	0.013	0.71
Tunas do Parana	0.003	0.006	0.003	0.55
Itaperucu	0.024	0.046	0.022	0.86
MRH-268	0.369	0.713	0.344	10.15

Required Supply Water in Each Municipal Urban (Surface Water)/ Domestic & Industrial / MRH-269

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Guaraquesaba	0.005	0.007	0.002	0.53
Antonina	0.031	0.048	0.017	0.78
Mprretes	0.013	0.021	0.008	0.63
Paranagua	0.239	0.372	0.133	2.51
Guaratuba	0.045	0.070	0.025	0.91
Matinhos	0.043	0.067	0.024	0.90
MRH-269	0.376	0.585	0.209	6.26

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-270

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Cervo Azul	0.021	0.034	0.013	0.71
Adrianpolis	0.010	0.017	0.007	0.62
Doutor Ulysses	0.002	0.004	0.002	0.53
MRH-270	0.033	0.055	0.022	1.86

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-271

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Tijucas do Sul	0.005	0.011	0.006	0.60
Agudos do Sul	0.003	0.006	0.003	0.55
Pien	0.016	0.035	0.019	0.81
Quitandinha	0.010	0.022	0.012	0.70
MRH-271	0.034	0.074	0.040	2.66

Required Supply Water in Each Municipal Urban (Surface Water)/ Domestic & Industrial / MRH-272

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Campo de Tenente	0.011	0.020	0.009	0.65
Rio Negro	0.081	0.141	0.060	1.49
Lapa	0.081	0.142	0.061	1.51
Palmeira	0.060	0.104	0.044	1.23
Porto Amazonas	0.010	0.017	0.007	0.62
MRH-272	0.243	0.424	0.181	5.50

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-273

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Castro	0.163	0.283	0.120	2.37
Piraí do Sul	0.045	0.079	0.034	1.06
Tibagi	0.034	0.060	0.026	0.93
Telemaco Borba	0.228	0.398	0.170	2.92
Ventania	0.016	0.028	0.012	0.70
MRH-273	0.486	0.848	0.362	7.98

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-274

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Jaguariaiva	0.102	0.361	0.259	3.81
Senges	0.041	0.145	0.104	2.19
Arapoti	0.063	0.223	0.160	2.81
MRH-274	0.206	0.729	0.523	8.81

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-275

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Antonio Olinto	0.003	0.004	0.001	0.52
Sao Mateus do Sul	0.054	0.089	0.035	1.08
Sao Joao do Triunto	0.010	0.017	0.007	0.62
MRH-275	0.067	0.110	0.043	2.22

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-276

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Prudentopolis	0.039	0.064	0.025	0.91
Imbituba	0.027	0.045	0.018	0.80
Texeira Soares	0.017	0.028	0.011	0.68
Irati	0.110	0.183	0.073	1.70
Reboucas	0.019	0.032	0.013	0.71
Rio Azul	0.011	0.018	0.007	0.62
Mallet	0.023	0.038	0.015	0.75
MRH-276	0.246	0.408	0.162	6.17

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-277

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Ortigueira	0.017	0.027	0.010	0.67
Reserva	0.032	0.049	0.017	0.78
Candido de Abreu	0.017	0.026	0.009	0.65
Ivai	0.012	0.019	0.007	0.62
Ipiranga	0.012	0.019	0.007	0.62
MRH-277	0.090	0.140	0.050	3.34

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-278

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Carlopolis	0.016	0.027	0.011	0.68
Salto do Itarare	0.008	0.013	0.005	0.58
Santana do Itarare	0.007	0.012	0.005	0.58
Sao Jose da Boa Vista	0.010	0.016	0.006	0.60
Wenceslau Braz	0.036	0.059	0.023	0.88
Siqueira Campos	0.021	0.035	0.014	0.73
Tomazina	0.010	0.017	0.007	0.62
Quatigua	0.012	0.020	0.008	0.63
Joaquin Tavora	0.016	0.025	0.009	0.65
Guapirama	0.008	0.014	0.006	0.60
Conselheiro Marink	0.006	0.010	0.004	0.57
Jaboti	0.005	0.008	0.003	0.55
Japira	0.005	0.009	0.004	0.57
Ibaiti	0.038	0.063	0.025	0.91
Pinhalao	0.007	0.012	0.005	0.58
Curiuva	0.014	0.023	0.009	0.65
Sapopema	0.010	0.016	0.006	0.60
Figueira	0.029	0.048	0.019	0.81
MRH-278	0.258	0.427	0.169	11.79

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-279

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Jacarezinho	0.093	0.147	0.054	1.39
Ribeirao Claro	0.019	0.030	0.011	0.68
Santo Antonio da Planita	0.085	0.133	0.048	1.29
Barra do Jacare	0.004	0.007	0.003	0.55
Cambara	0.050	0.079	0.029	0.98
Andira	0.053	0.083	0.030	1.00
Itambaraca	0.024	0.038	0.014	0.73
Bandeirantes	0.077	0.120	0.043	1.21
Santa Amelia	0.007	0.011	0.004	0.57
Abatia	0.019	0.030	0.011	0.68
Ribeirao do Pinhal	0.026	0.041	0.015	0.75
Jundiai do Sul	0.006	0.010	0.004	0.57
Congonhinhas	0.014	0.023	0.009	0.65
Santo Antpnio do Paraiso	0.003	0.005	0.002	0.53
Nova Fatima	0.019	0.029	0.010	0.67
Nova America do Colina	0.006	0.010	0.004	0.57
Cornelio Procopio	0.125	0.196	0.071	1.67
Santa Mariana	0.024	0.037	0.013	0.71
Leopolis	0.008	0.013	0.005	0.58
Sertaneja	0.014	0.023	0.009	0.65
MRH-279	0.676	1.065	0.389	16.43

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-280

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Urai	0.027	0.039	0.012	0.70
Rancho Alegre	0.010	0.014	0.004	0.57
Jataizinho	0.025	0.035	0.010	0.67
Assai	0.039	0.055	0.016	0.76
Sao Sebastiao da Amoreira	0.017	0.024	0.007	0.62
Santa Cecilia do Pavao	0.007	0.010	0.003	0.55
Sao Jeronimo da Serra	0.018	0.025	0.007	0.62
Nova Santa Barbara	0.006	0.008	0.002	0.53
MRH-280	0.149	0.210	0.061	5.02

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-281

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Primeiro de Maio	0.028	0.049	0.021	0.85
Sertanopolis	0.029	0.051	0.022	0.86
Ibipora	0.105	0.183	0.078	1.79
Cambe	0.223	0.391	0.168	2.90
Bela Vista do Paraiso	0.036	0.062	0.026	0.93
Alvorada do Sul	0.016	0.028	0.012	0.70
Miraselva	0.010	0.017	0.007	0.62
Flovestopolis	0.027	0.047	0.020	0.83
Porecatu	0.027	0.048	0.021	0.85
Jaguapita	0.024	0.043	0.019	0.81
Centenario do Sul	0.030	0.052	0.022	0.86
Guaraci	0.012	0.020	0.008	0.63
Nussa Senhora dos Gracas	0.007	0.012	0.005	0.58
Cafera	0.005	0.009	0.004	0.57
Lupinopolis	0.010	0.018	0.008	0.63
Colorado	0.053	0.093	0.040	1.16
Santo Inacio	0.013	0.022	0.009	0.65
Santa Ines	0.003	0.005	0.002	0.53
Itaguaje	0.009	0.017	0.008	0.63
Rolandia	0.102	0.179	0.077	1.77
Arapongas	0.174	0.305	0.131	2.49
Sabaudia	0.010	0.018	0.008	0.63
Astoroga	0.056	0.098	0.042	1.19
Munhoz de Melo	0.006	0.010	0.004	0.57
Iguaracu	0.010	0.018	0.008	0.63
Santa Fe	0.020	0.034	0.014	0.73
Florida	0.006	0.010	0.004	0.57
Lobato	0.010	0.018	0.008	0.63
Pitangueiras	0.004	0.006	0.002	0.53
Angulo	0.006	0.011	0.005	0.58
MRH-281	1.071	1.874	0.803	27.70

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-282

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Mandaguari	0.065	0.131	0.066	1.59
Marialva	0.049	0.098	0.049	1.31
Itambe	0.014	0.029	0.015	0.75
Floresta	0.012	0.023	0.011	0.68
Ivatuba	0.005	0.010	0.005	0.58
Doutor Camargo	0.013	0.025	0.012	0.70
Paicandu	0.095	0.191	0.096	2.08
Ourizona	0.008	0.016	0.008	0.63
Mangaguacu	0.036	0.073	0.037	1.11
Sao Jorge do Ivai	0.012	0.023	0.011	0.68
Floraí	0.010	0.021	0.011	0.68
Atalaia	0.009	0.017	0.008	0.63
Uniflor	0.005	0.010	0.005	0.58
Sao Carlos do Ivai	0.010	0.021	0.011	0.68
Sarandi	0.207	0.415	0.208	3.33
MRH-282	0.550	1.103	0.553	16.01

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-283

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Presidente Castero Branco	0.007	0.011	0.004	0.57
Nova Esperanca	0.046	0.072	0.026	0.93
Cruzeiro do Sul	0.009	0.015	0.006	0.60
Paranacity	0.015	0.024	0.009	0.65
Inaja	0.006	0.009	0.003	0.55
Paranapoema	0.007	0.011	0.004	0.57
Jardim Olinda	0.003	0.005	0.002	0.53
Alto Parana	0.023	0.036	0.013	0.71
Sao Joao do Caiua	0.013	0.020	0.007	0.62
Santo Antonio do Caiua	0.004	0.006	0.002	0.53
Tambora	0.008	0.012	0.004	0.57
Paraiso do Norte	0.022	0.034	0.012	0.70
Nova Alianca do Ivai	0.002	0.004	0.002	0.53
Mirador	0.005	0.008	0.003	0.55
Paranavai	0.171	0.268	0.097	2.10
Amapora	0.011	0.017	0.006	0.60
Planaltina do Parana	0.006	0.009	0.003	0.55
Guairaca	0.008	0.013	0.005	0.58
Terra Rica	0.030	0.047	0.017	0.78
Diamante de Norte	0.014	0.022	0.008	0.63
Itauna do Sul	0.011	0.017	0.006	0.60
Nova Londrina	0.029	0.045	0.016	0.76
Loanda	0.037	0.058	0.021	0.85
Santa Izabel do Ivai	0.012	0.019	0.007	0.62
Santa Cruz do Monte Castelo	0.018	0.028	0.010	0.67
Querencia do Norte	0.019	0.029	0.010	0.67
Sao Pedro do Parana	0.003	0.005	0.002	0.53
Porto Rico	0.004	0.007	0.003	0.55
Marilena	0.011	0.017	0.006	0.60
Santa Monica	0.002	0.002	0.000	0.60
MRH-283	0.556	0.870	0.314	20.30

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-284

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Grandes Rios	0.015	0.024	0.009	0.65
California	0.015	0.025	0.010	0.67
Rio Bom	0.005	0.008	0.003	0.55
Marilandia do Sul	0.016	0.027	0.011	0.68
Faxinal	0.035	0.060	0.025	0.91
Borrazopolis	0.016	0.027	0.011	0.68
Cambira	0.010	0.018	0.008	0.63
Jandaia do Sul	0.048	0.081	0.033	1.04
Bom Sucesso	0.015	0.026	0.011	0.68
Sao Pedro do Ivai	0.025	0.042	0.017	0.78
Marumbi	0.009	0.016	0.007	0.62
Kalore	0.009	0.015	0.006	0.60
Sao Joao do Ivai	0.032	0.053	0.021	0.85
Jardim Alegre	0.019	0.033	0.014	0.73
Ivaipora	0.081	0.136	0.055	1.41
Novo Itacolomi	0.003	0.005	0.002	0.53
Maua da Serra	0.010	0.017	0.007	0.62
Lidianopolis	0.006	0.009	0.003	0.55
Godoy Moreira	0.003	0.006	0.003	0.55
Rosario do Ivai	0.008	0.013	0.005	0.58
Lunardelli	0.010	0.017	0.007	0.62
MRH-284	0.390	0.658	0.268	14.93

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-285

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Alto Piquiri	0.024	0.037	0.013	0.71
Ipora	0.035	0.055	0.020	0.83
Xambre	0.007	0.010	0.003	0.55
Icaraima	0.018	0.028	0.010	0.67
Maria Helena	0.007	0.011	0.004	0.57
Cidade Gaucha	0.022	0.034	0.012	0.70
Cruzeiro do Oeste	0.043	0.067	0.024	0.90
Cauporema	0.003	0.005	0.002	0.53
Rondon	0.013	0.020	0.007	0.62
Tapejara	0.026	0.041	0.015	0.75
Tuneiras do Oeste	0.015	0.024	0.009	0.65
Japura	0.013	0.020	0.007	0.62
Sao Tome	0.008	0.012	0.004	0.57
Cianorte	0.113	0.175	0.062	1.52
Jussara	0.017	0.026	0.009	0.65
Terra Boa	0.026	0.040	0.014	0.73
Altonia	0.035	0.054	0.019	0.81
Perola	0.019	0.030	0.011	0.68
Indianapolis	0.005	0.008	0.003	0.55
Tapira	0.008	0.012	0.004	0.57
Nova Olimpia	0.010	0.015	0.005	0.58
Francisco Alves	0.010	0.015	0.005	0.58
Vila Alta	0.006	0.009	0.003	0.55
Sao Manoel do Parana	0.002	0.004	0.002	0.53
Cafezal do Sul	0.006	0.009	0.003	0.55
Brasilandia do Sul	0.006	0.010	0.004	0.57
Ivate	0.006	0.010	0.004	0.57
Douradina	0.008	0.012	0.004	0.57
Sao Jorge do Patrocinio	0.008	0.012	0.004	0.57
MRH-285	0.519	0.805	0.286	19.25

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-286

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Campo Mourao	0.232	0.397	0.165	2.87
Ara Una	0.017	0.028	0.011	0.68
Peabiru	0.024	0.042	0.018	0.80
Engenheiro Beltrao	0.026	0.045	0.019	0.81
Quinta do Sol	0.009	0.016	0.007	0.62
Fenix	0.011	0.018	0.007	0.62
Barbora Ferraz	0.028	0.049	0.021	0.85
Iretama	0.021	0.037	0.016	0.76
Roncador	0.022	0.037	0.015	0.75
Nova Cantu	0.013	0.023	0.010	0.67
Campina da Lagoa	0.035	0.060	0.025	0.91
Ubirata	0.054	0.092	0.038	1.13
Mambore	0.025	0.043	0.018	0.80
Boa Esperanca	0.008	0.013	0.005	0.58
Janiopolis	0.012	0.021	0.009	0.65
Goio-Ere	0.083	0.142	0.059	1.47
Moreira Sies	0.031	0.053	0.022	0.86
Mariluz	0.021	0.035	0.014	0.73
Rancho Alegre do Oeste	0.006	0.010	0.004	0.57
Farol	0.006	0.010	0.004	0.57
Luiziana	0.012	0.020	0.008	0.63
Corumbatai do Sul	0.005	0.008	0.003	0.55
Juranda	0.012	0.020	0.008	0.63
MRH-286	0.713	1.219	0.506	19.51

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-287

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Pitanga	0.064	0.157	0.093	2.03
Palmital	0.017	0.043	0.026	0.93
Manoel Ribas	0.018	0.044	0.026	0.93
Santa Maria D'Oeste	0.005	0.013	0.008	0.63
Mato Rico	0.001	0.003	0.002	0.53
Laranjal	0.003	0.007	0.004	0.57
Nova Tebas	0.013	0.032	0.019	0.81
Altamira do Parana	0.006	0.014	0.008	0.63
MRH-287	0.127	0.313	0.186	7.06

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-288

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Guaraniacu	0.024	0.051	0.027	0.95
Catanduvas	0.015	0.033	0.018	0.80
Corbelia	0.031	0.068	0.037	1.11
Capitao Leonidas Marques	0.015	0.033	0.018	0.80
Formosa do Oeste	0.015	0.031	0.016	0.76
Assis Chateaubriand	0.082	0.175	0.093	2.03
Palotina	0.060	0.129	0.069	1.64
Terra Roxa	0.031	0.067	0.036	1.09
Guaira	0.062	0.134	0.072	1.69
Marechal Candido Rondon	0.056	0.120	0.064	1.56
Toledo	0.273	0.587	0.314	4.31
Matelandia	0.025	0.053	0.028	0.96
Medianeira	0.091	0.195	0.104	2.19
Sao Miguel do Iguacu	0.032	0.068	0.036	1.09
Foz do Iguacu	0.782	1.679	0.897	7.99
Ceu Azul	0.017	0.036	0.019	0.81
Nova Aurora	0.026	0.055	0.029	0.98
Santa Helena	0.018	0.038	0.020	0.83
Nova Santa Rosa	0.012	0.026	0.014	0.73
Sao Pedro do Iguacu	0.009	0.020	0.011	0.68
Santa Lucia	0.005	0.010	0.005	0.58
Ramilandia	0.006	0.012	0.006	0.60
Quatro Pontes	0.003	0.006	0.003	0.55
Pato Bragado	0.004	0.008	0.004	0.57
Mercedes	0.002	0.004	0.002	0.53
Maripa	0.007	0.015	0.008	0.63
Itaipulandia	0.003	0.006	0.003	0.55
Iracema do Oeste	0.007	0.014	0.007	0.62
Iguatu	0.003	0.006	0.003	0.55
Entre Rios do Oeste	0.003	0.006	0.003	0.55
Diamante so Sul	0.002	0.005	0.003	0.55
Anahy	0.004	0.009	0.005	0.58
Santa Tereza do Oeste	0.010	0.021	0.011	0.68
Ouro Verde do Oeste	0.010	0.021	0.011	0.68
Lindoeste	0.002	0.003	0.001	0.52
Ibema	0.021	0.044	0.023	0.88
Sao Jose des Palmeiras	0.007	0.015	0.008	0.63
Diamante D'Oeste	0.012	0.026	0.014	0.73
Campo Bonito	0.005	0.011	0.006	0.60
Boa Vista da Aparecida	0.008	0.017	0.009	0.65
Missal	0.014	0.030	0.016	0.76
Santa Terezinhodo do Itaipu	0.039	0.084	0.045	1.24
Iesuitas	0.016	0.034	0.018	0.80
Braganey	0.010	0.021	0.011	0.68
Vera Cruz d Oeate	0.015	0.032	0.017	0.78
Tres Barras do Parana	0.011	0.023	0.012	0.70
Catelandia	0.027	0.059	0.032	1.03
Tupassi	0.015	0.032	0.017	0.78
MRH-288	1.947	4.172	2.225	52.00

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-289

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Chopinznho	0.027	0.050	0.023	0.88
Coronal	0.040	0.073	0.033	1.04
Sao Joao	0.016	0.030	0.014	0.73
Itapejara D'Oeste	0.013	0.024	0.011	0.68
Pato Branco	0.151	0.275	0.124	2.41
Mariopolis	0.009	0.017	0.008	0.63
Vitorino	0.009	0.016	0.007	0.62
Renascenca	0.006	0.011	0.005	0.58
Marmeleiro	0.025	0.045	0.020	0.83
Francisco Beltrao	0.183	0.333	0.150	2.70
Vere	0.010	0.018	0.008	0.63
Dois Vizinhos	0.087	0.158	0.071	1.67
Sao Jorge D'Oeste	0.011	0.019	0.008	0.63
Salgado Filho	0.006	0.011	0.005	0.58
Barracao	0.019	0.034	0.015	0.75
Santo Antonio do Sudoeste	0.027	0.050	0.023	0.88
Eneas Marques	0.005	0.008	0.003	0.55
Salto do Lontra	0.017	0.031	0.014	0.73
Santa Izabel do Oeste	0.014	0.025	0.011	0.68
Ampere	0.019	0.035	0.016	0.76
Realeza	0.027	0.049	0.022	0.86
Perolaza	0.010	0.018	0.008	0.63
Planalto	0.012	0.022	0.010	0.67
Capanema	0.022	0.041	0.019	0.81
Saudade do Iguacu	0.006	0.012	0.006	0.60
Pinhal do Sao Bento	0.002	0.003	0.001	0.52
Nova Esperanca do Sudoeste	0.002	0.004	0.002	0.53
Flor da Serra do Sul	0.001	0.002	0.001	0.52
Cruzeiro do Iguacu	0.008	0.015	0.007	0.62
Bom Sucesso do Sul	0.004	0.007	0.003	0.55
Boa Esperanca do Iguacu	0.002	0.004	0.002	0.53
Sulina	0.003	0.005	0.002	0.53
Pranchita	0.010	0.018	0.008	0.63
Nova Prata do Iguacu	0.012	0.022	0.010	0.67
MRH-289	0.815	1.485	0.670	27.63

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-290

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Guarapuava	0.462	0.894	0.432	5.24
Inacio Martins	0.009	0.018	0.009	0.65
Pinhao	0.029	0.057	0.028	0.96
Laranjeiras do Sul	0.067	0.129	0.062	1.52
Quedas do Iguacu	0.061	0.118	0.057	1.44
Virmond	0.002	0.004	0.002	0.53
Rio Bonito do Iguacu	0.002	0.005	0.003	0.55
Nova Laranjeiras	0.001	0.002	0.001	0.52
Candoi	0.007	0.014	0.007	0.62
Turvo	0.014	0.027	0.013	0.71
Cantagalo	0.046	0.090	0.044	1.23
MRH-290	0.700	1.358	0.658	13.97

Required Supply Water in Each Municipal Urban [Surface Water]/ Domestic & Industrial / MRH-291

Municipio Name	1993 m3/s	2015 m3/s	2015-'93 m3/s	Cost million US$
Uniao da Vitoria	0.133	0.229	0.096	2.08
Paula Freitas	0.008	0.014	0.006	0.60
Paulo Frontin	0.007	0.011	0.004	0.57
Cruz Mavhado	0.010	0.017	0.007	0.62
Bituruna	0.024	0.042	0.018	0.80
Porto Vitoria	0.007	0.011	0.004	0.57
General Carneiro	0.031	0.054	0.023	0.88
Palmas	0.102	0.175	0.073	1.70
Mangueirinha	0.024	0.041	0.017	0.78
Clevelandia	0.044	0.075	0.031	1.01
Honorio Serpa	0.004	0.007	0.003	0.55
MRH-291	0.394	0.676	0.282	10.16

Type-C-Cost

Municipality Name	Type	Zone	2005-1993 Urban Total	2015-1993 Urban Total	Cost 2005	Cost 2015	Remark
Quitandinha	C	a	0.002	0.003	0.22	0.33	S
Campo do Tenente	C	a	0.003	0.008	0.15	0.39	S
Porto Amazonas	C	a	0.002	0.004	0.17	0.34	S
Rio Negro	C	a	0.041	0.100	0.43	1.06	S
Sao Joao do Triunfo	C	a	0.004	0.007	0.22	0.38	S
Sao Mateus do Sul	C	a	0.018	0.048	0.28	0.75	S
Mallet	C	a	0.011	0.022	0.27	0.54	S
Reboucas	C	a	0.004	0.009	0.18	0.40	S
Capitao Leonidas Marques	C	a	0.005	0.007	0.27	0.38	S
Boa Esperanca do Iguacu	C	a	0.001	0.002	0.16	0.32	S
Bom Sucesso do Sul	C	a	0.001	0.002	0.16	0.32	S
Itapejara do Oeste	C	a	0.001	0.005	0.07	0.36	S
Marmeleiro	C	a	0.010	0.019	0.27	0.51	S
Realeza	C	a	0.002	0.004	0.17	0.34	S
Santa Izabel do Oeste	C	a	0.001	0.002	0.16	0.32	S
Saudade do Iguacu	C	a	0.000	0.003	0.00	0.33	S
Sulina	C	a	0.002	0.004	0.17	0.34	S
Quedas do Iguacu	C	a	0.017	0.038	0.30	0.67	S
Rio Bonito Iguacu	C	a	0.001	0.005	0.07	0.36	S
Virmond	C	a	0.000	0.000	0.00	0.00	S
Bituruna	C	a	0.012	0.020	0.31	0.52	S
Paula Freitas	C	a	0.004	0.008	0.20	0.39	S
Porto Vitoria	C	a	0.001	0.002	0.16	0.32	S
Agudos do Sul	C	b	0.000	0.000	0.00	0.00	S
Pien	C	b	0.003	0.008	0.65	1.74	S
Rio Azul	C	b	0.001	0.005	0.31	1.57	S
Boa Vista da Aparecida	C	b	0.001	0.002	0.53	1.06	G
Catanduvas	C	b	0.006	0.011	1.04	1.90	S
Ibema	C	b	0.007	0.013	1.07	1.99	S
Santa Lucia	C	b	0.001	0.002	0.53	1.06	G
Tres Barras Parana	C	b	0.002	0.003	0.71	1.06	G
Ampere	C	b	0.004	0.010	0.74	1.85	S
Capanema	C	b	0.000	0.001	0.00	1.06	G
Chopinzinho	C	b	0.005	0.012	0.81	1.94	S
Coronel Vivida	C	b	0.008	0.018	0.99	2.23	S
Cruzeiro do Iguacu	C	b	0.008	0.015	1.11	2.09	S
Eneas Marques	C	b	0.000	0.001	0.00	1.06	G
Mariopolis	C	b	0.001	0.003	0.35	1.06	G
Nova Esperanca do Sudoeste	C	b	0.001	0.001	1.06	1.06	G
Perola do Oeste	C	b	0.001	0.002	0.53	1.06	G
Pinhal Sao Bento	C	b	0.000	0.001	0.00	1.06	G
Planalto	C	b	0.001	0.002	0.53	1.06	G
Pranchita	C	b	0.003	0.006	0.81	1.62	S
Renascenca	C	b	0.002	0.003	0.71	1.06	G
Salgado Filho	C	b	0.001	0.003	0.35	1.06	G
Salto do Lontra	C	b	0.004	0.009	1.08	2.42	S
Santo Antonio Sudoeste	C	b	0.003	0.009	0.81	2.42	S
Sao Joao	C	b	0.004	0.007	0.96	1.68	S
Sao Jorge do Oeste	C	b	0.001	0.001	1.06	1.06	G
Vere	C	b	0.003	0.006	0.81	1.62	S
Vitorino	C	b	0.002	0.004	0.76	1.51	S
Cantagalo	C	b	0.027	0.086	1.30	4.13	S
Pinhao	C	b	0.000	0.004	0.00	1.51	S
Clevelandia	C	b	0.003	0.006	0.81	1.62	S
Cruz Machado	C	b	0.010	0.013	1.53	1.99	S
General Carneiro	C	b	0.015	0.030	1.35	2.70	S

Type-C-Cost

Municipality Name	Type	Zone	2005-1993 Urban Total	2015-1993 Urban Total	Cost 2005	Cost 2015	Remark
Pirai do Sul	C	a	0.022	0.044	0.36	0.72	S
Tibagi	C	a	0.012	0.028	0.25	0.59	S
Ipiranga	C	a	0.002	0.003	0.22	0.33	S
Ortigueira	C	a	0.000	0.001	0.00	0.31	S
Sapopema	C	a	0.003	0.007	0.16	0.38	S
Jataizinho	C	a	0.004	0.010	0.16	0.41	S
Nova Santa Barbara	C	a	0.001	0.002	0.16	0.32	S
Sao Jeronimo da Serra	C	a	0.006	0.013	0.20	0.44	S
Primeiro de Maio	C	a	0.005	0.015	0.16	0.47	S
Palmeira	C	b	0.022	0.044	1.57	3.13	S
Reserva	C	b	0.007	0.013	1.07	1.99	S
N. America da Colina	C	b	0.004	0.006	0.71	1.06	G
Santo Antonio do Paraiso	C	b	0.000	0.001	0.00	1.06	G
Santa Cecilia do Pavao	C	b	0.002	0.004	0.53	1.06	G
Sao Sebastiao da Amorei	C	b	0.006	0.014	0.57	1.32	G
Urai	C	b	0.004	0.011	0.39	1.06	G
Sertanopolis	C	b	0.011	0.026	0.95	2.24	G
Imbituva	C	c	0.007	0.016	1.35	3.09	S
Teixeira Soares	C	c	0.004	0.009	1.20	2.71	S
Curiuva	C	c	0.004	0.009	1.20	2.71	S
Congonhinhas	C	c	0.004	0.009	0.47	1.06	G
Sertanejа	C	c	0.008	0.018	0.75	1.68	G
Assai	C	c	0.006	0.016	0.56	1.50	G
Rancho Alegre	C	c	0.004	0.007	0.61	1.06	G
California	C	c	0.004	0.009	0.47	1.06	G
Maua da Serra	C	c	0.004	0.012	0.38	1.15	G
Total			0.156	0.347	14.45	32.91	

Type-C-Cost

Honorio Serpa	C	b	0.001	0.003	0.35	1.06	G
Mangueirinha	C	b	0.010	0.021	1.12	2.36	S
Paulo Frontin	C	b	0.003	0.005	0.94	1.57	S
Tijucas do Sul	C	c	0.001	0.003	0.78	2.34	S
Lapa	C	c	0.012	0.034	1.42	4.03	S
Antonio Olinto	C	c	0.001	0.003	0.78	2.34	S
Ceu Azul	C	c	0.011	0.015	2.23	3.04	S
Guaraniacu	C	c	0.010	0.017	1.85	3.14	S
Lindoeste	C	c	0.000	0.000	0.00	0.00	G
Matelandia	C	c	0.009	0.015	1.82	3.04	S
Santa Tereza do Oeste	C	c	0.003	0.007	0.87	2.03	G
Santa Terezinha Itaipu	C	c	0.018	0.034	2.13	4.03	S
Sao Miguel do Iguacu	C	c	0.013	0.023	1.96	3.46	S
Barracao	C	c	0.007	0.013	1.58	2.93	S
Flor da Serra do Sul	C	c	0.000	0.000	0.00	0.00	G
Nova Prata do Iguacu	C	c	0.001	0.002	0.53	1.06	G
Candoi	C	c	0.001	0.004	0.33	1.30	G
Inacio Martins	C	c	0.002	0.005	0.62	1.55	G
Laranjeiras do Sul	C	c	0.002	0.005	0.62	1.55	G
Nova Laranjeiras	C	c	0.000	0.000	0.00	0.00	G
Total			0.376	0.828	47.62	102.81	

II-5 Description of Existing Intake Facilities

Intake from Surface Water

No	Location: Municipality	Name of Intake	Basin	River (Reservoir)	River Width (m)	Proprietor	System Description: Water Source	Method	Weir/dam Height (m)	Mean Intake Rate (m3/sec)	Operation Hour (hour/day)	Operation Year (year)	Description of Pipeline: Length (km)	Diameter (mm)	Water Head (m)	Intake Pump (pumps)	Water Loss (%)	Remarks
<Urban Area in Iguacu River Basin>																		
1	Foz do Iguacu	Tamandua	Iguacu	Tamandua	16	SANEPAR	Surface	Direct Weir	2	0.36	24	Aug.1978		500	20	3	46.2	Water loss indicates a
2	Foz do Iguacu	Vila "C"	Parana	Itaipu Res.		SANEPAR	Surface	Direct	Non	0.3	21		5.0	500	29	2	46.2	distribution loss.
3	Cascavel	Cascavel	Iguacu	Cascavel	5	SANEPAR	Surface	Direct	Non	0.11	24	Jan.1973	7.2	700	173.3		41	(as of Nov.1994)
4	Cascavel	Peroba	Iguacu	Rio de Pez	7	SANEPAR	Surface	Direct Weir	2	0.13	13	1982	1.8	400,500	26.6	2	41	
5	Cascavel	Saltinho	Iguacu	Saltinho		SANEPAR	Surface	Direct Weir		0.06		1982	4.0	400	106	2	41	
6	Guaraniacu	Firela	Piquiri	Firela	15	SANEPAR	Surface	Direct Weir	2	0.025	12	Sep.1980	5.1	150	258.5	4	31.4	
7	Nova Laranjeiras	Cobras	Iguacu	Cobras	7	SANEPAR	Surface	Direct Weir		0.006	5	1983	0.2	75	11	2	37.6	
8	Laranjeiras do Sul	Leao	Iguacu	Leao		SANEPAR	Surface	Direct Weir	1	0.05	18.5	1978	5.7	150,200	160	4	37.8	
9	Guarapuava	Pedras	Iguacu	Pedras		SANEPAR	Surface	Direct Weir		0.3	17	1966	1.1	400,350	200	3	37.7	
10	Pinhao	Invernada	Iguacu	Invernada		SANEPAR	Surface	Direct	Non	0.019	16	1980	1.5	150	40	2	27.9	
<Urban Area in Tibagi River Basin>																		
1	Londrina	Tibagi	Tibagi	Tibagi	150	SANEPAR	Surface	Direct	Non	1.2	16	Dec.1991	12.0	900,800	230	4	40.6	Water loss indicates a
2	Londrina	Cafezal	Tibagi	Cafezal	10	SANEPAR	Surface	Direct Weir	2	0.55	16	1959	5.7	500,600		3	40.6	distribution loss.
3	Apucarana	Caviuna	Ivai	Caviuna	5	SANEPAR	Surface	Direct	Non	0.22	22	1976	6.0	400	267	3	37	(as of Nov.1994)
4	Ortigueira	Formigas	Tibagi	Formigas	8	SANEPAR	Surface	Direct Weir	1.5	0.013	16.5	1982	4.0	100,150	35	2	28.9	
5	Telemaco Borba	Tibagi	Tibagi	Tibagi	80	SANEPAR	Surface	Direct	Non	0.16	18	1963/64	6.0	200,350	183.3	3	33	
6	Tibagi	Tibagi	Tibagi	Tibagi	120	SANEPAR	Surface	Direct	Non	0.03	10	1978	0.8	100,150	60	2	26.2	
7	Castro	Iapo	Tibagi	Iapo	25	SANEPAR	Surface	Direct	Non	0.058	20	1963	0.3	250	61.7	2	30.5	
8	Castro	Sao Cristovao	Tibagi	Sao Cristovao		SANEPAR	Surface	Dam	4	0.021	24	1940	0.5	200	27	2	30.5	
9	Ponta Grossa	Pitangui	Tibagi	Pitangui	15	SANEPAR	Surface	Direct Weir	4	0.3	21	1985	6.0	700	150	3	39.4	
10	Ponta Grossa	Alagados	Tibagi	Alagados Reservoir		SANEPAR	Surface	Dam (COPEL)		0.4	21	1971	14.8	600		5	39.4	

Intake from Groundwater

No.	Location: Municipality	Name of Intake	Basin	Aquifer Source	Proprietor	System Description: Water Source	Method	Well Number (well)	Mean Intake Rate (m3/sec)	Operation Hour (hour/day)	Operation Year (year)	Description of Pipeline: Length (km)	Diameter (mm)	Well Depth (m)	Intake Pump (pumps)	Water Loss (%)	Remarks
<Urban Area in Iguacu River Basin>																	
1	Cascavel	Santa Cruz	Parana 3	Serra Geral	SANEPAR	Ground	Well	3	0.026	16	Aug.1993			103	1	40	Water loss indicates a
2	Cascavel	Periolo	Piquiri	Serra Geral	SANEPAR	Ground	Well	2	0.032	14	Sep.1993			47,35	2	40	distribution loss.
3	Cascavel	Mulumbi	Piquiri	Serra Geral	SANEPAR	Ground	Well	2	0.015							40	(as of Nov.1994)
4	Ibema	Ibema	Iguacu		SANEPAR	Ground	Well	1	0.008	15.8	Aug.1993	3.0	200	150	1	34.1	
<Urban Area in Tibagi River Basin>																	
1	Londrina	Tibagi	Tibagi		SANEPAR	Ground	Well	2	0.029	18							
2	Apucarana	Schmidt Farm	Tibagi	Serra Geral	SANEPAR	Ground	Well	1	0.026	4	1991			150			
3	Ortigueira	Ortigueira	Tibagi		SANEPAR	Ground	Well	1	0.001	11		0.15	60	36			

Description of Existing Intake Facilities

No./Name Passauna Intake (Curitiba)

<Location>

Basin	River	Municipality	Proprietor	Others
Upper Iguacu	Passauna Reservoir	Curitiba	SANEPAR	

<Description of System>

Intake Method	Intake Rate (Operation hour)	Supply System	Supply Connection	Operation Year
Surface Water	2.0 (Max.capacity)	South Curitiba and	About 25 % supply	
Direct with dam reservoir	1.7 (22 hours/day)	Araucaria area	area is covered.	1993
	(m3/sec)		(inhabitants)	

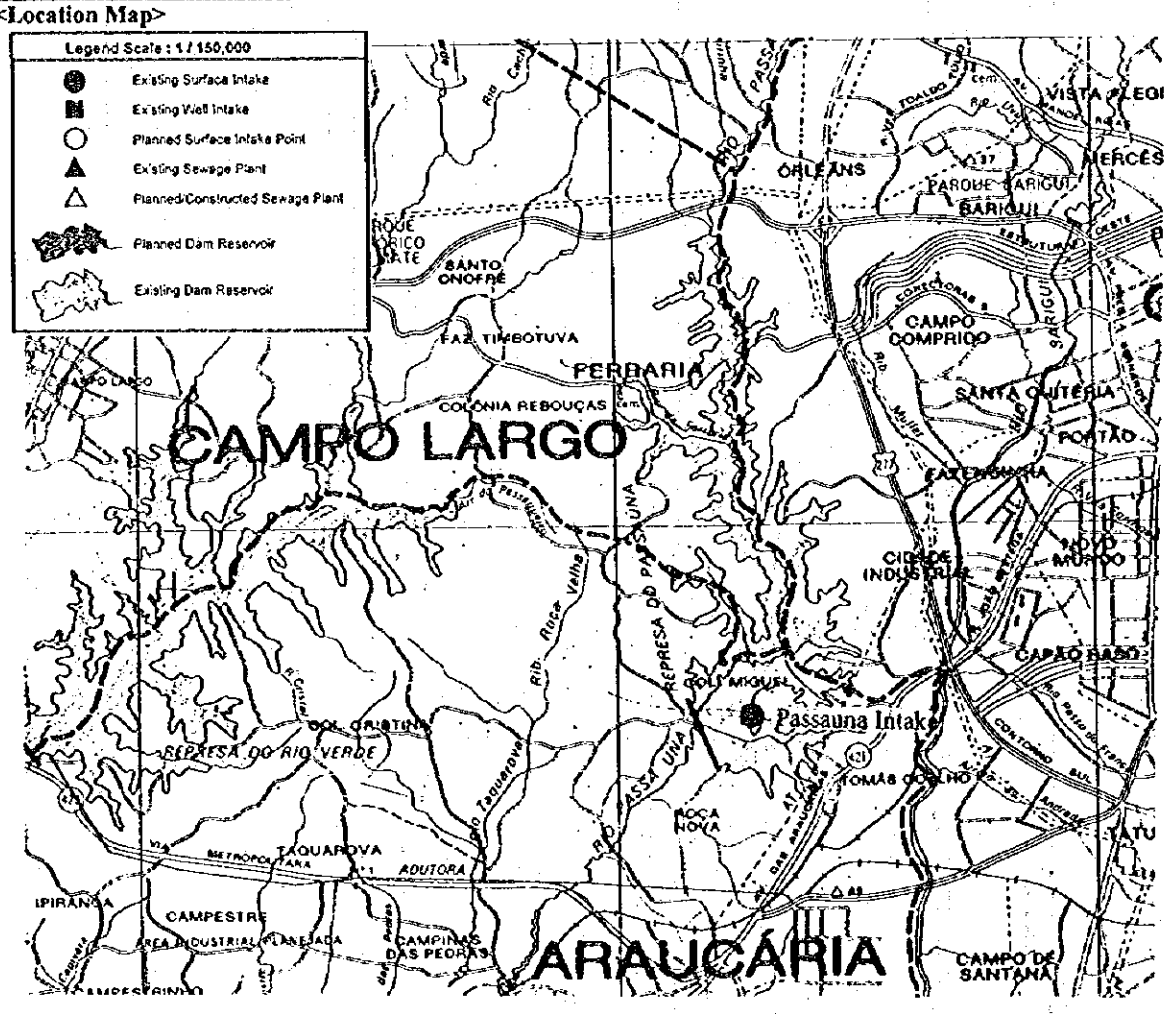
<Description of Pipeline>

Length	Diameter	Water Head	Intake Pump	Intermediate Pump	Others
	600		3 pumps		
2	900	80	500CV, 700CV		
(km)	(mm)	(m)	(1 is standby)		

<Future Plan / or Other informations, if any>

There exists two other dam intakes supply to Curitiba region, such as Iguacu Intake (3.4 m3/sec) and Irai Intake (0.93 m3/sec).

<Location Map>



Description of Existing Intake Facilities

No./Name

Iguacu Intake (Curitiba)

<Location>

Basin	River	Municipality	Proprietor	Others
Upper Iguacu	Iguacu	Curitiba	SANEPAR	

<Description of System>

Intake Method	Intake Rate (Operation hour)	Supply System	Supply Connection	Operation Year
Surface Water Direct with weir	3.0 (Max.capacity) 3.4 (24 hours/day) (m3/sec)	Integrated Sys.	1,394,086 (as of Dec.1994) (inhabitants)	Mar.1994

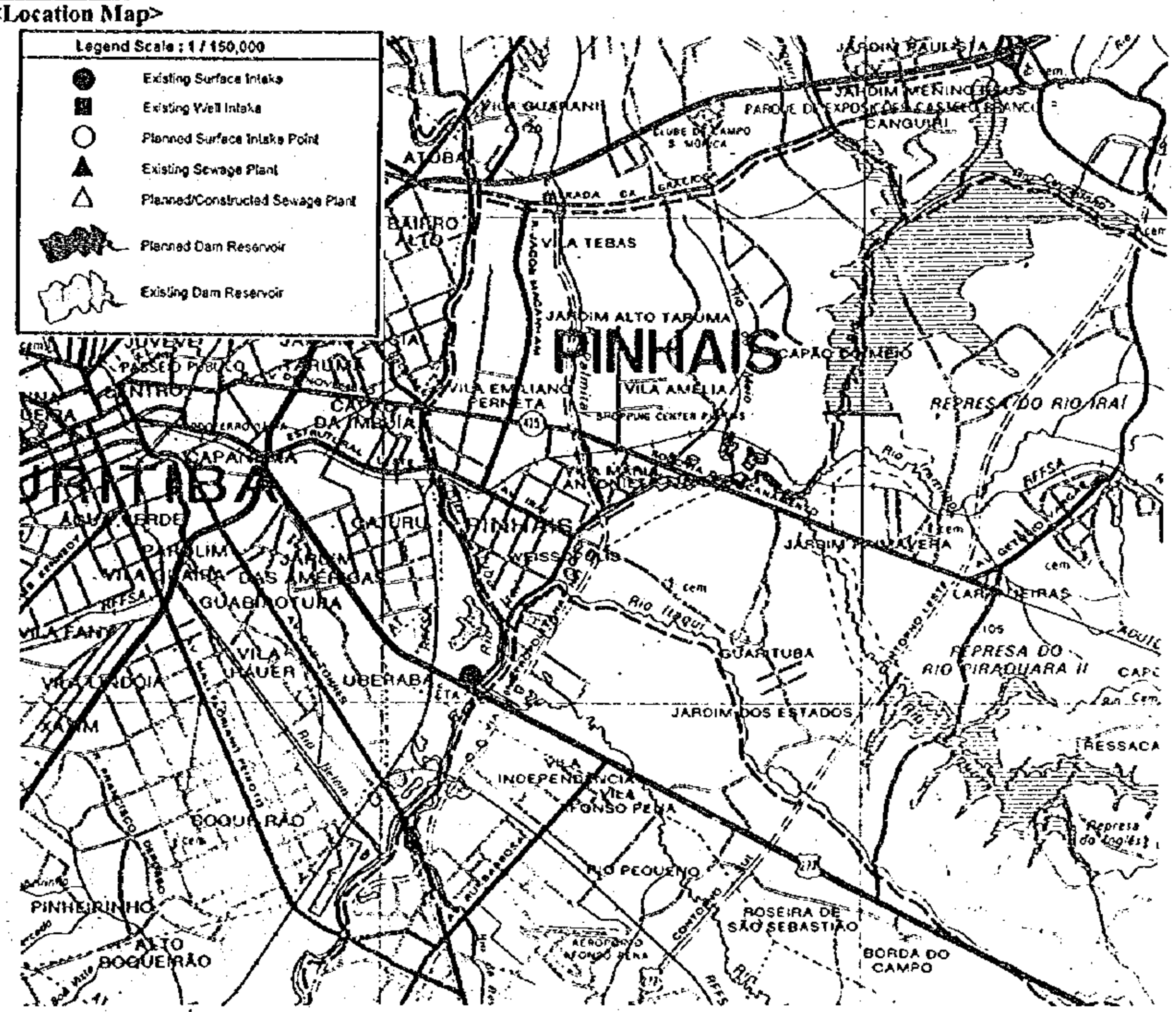
<Description of Pipeline>

Length	Diameter	Water Head	Intake Pump	Intermediate Pump	Others
Double Pipe 3.5 (km)	1,100 (mm)	40 (m)	6 pumps (600CV,500CV) (no standby)		

<Future Plan / or Other informations, if any>

There exists two other dam intakes supply to Curitiba region, such as Passauna Intake (2.0 m3/sec) and Irai Intake (0.93 m3/sec).

<Location Map>



Description of Existing Intake Facilities

No./Name
Almirante Tamandare Wells (P-01, P-09, P-17 and P-20)

<Location>

Basin	Source	Municipality	Proprietor	Others
Upper Iguacu	Karst Aquifer	Almirante Tamandare	SANEPAR	

<Description of System>

Intake Method	Intake Rate (Operation hour)	Supply System	Supply Connection	Operation Year
Groundwater Direct from 4 wells	382.50 (20 hours/day) (total rate) (Mar.13 '95) (m3/hour)	Almirante Tamandare Urban Area	(inhabitants)	(date of drilling)

<Description of Pipeline>

No. of Well	Length	Diameter	Depth of Well	Intake Rate	Pump Others
P-01	1	8	59	46.2	1 pump,15CV
(P-07)		(8)	(159)	(147)	(1 pump, 18CV) (Emergency use)
P-09	0.2	8	100	59.4	1 pump, 16CV
P-17	0.2	10	50.2	142.9	1 pump, 25 CV
P-20	0.2	10	45	133.5	1 pump, 25 CV
	(km)	(inches)	(m)	(m3/hour)	

<Future Plan / or Other informations, if any>
Totally 8 wells exist, but only 4 wells were stopped operating due to foundation subside phenomena.

<Location Map>