

DATA BOOK

10: SAN ESTEBAN DAM

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DATA BOOK 10: SAN ESTEBAN DAM

1. STREAMFLOW DATA

Table 10.1 to Table 10.11 show stream flow data at Villerias and Moscoso between 1970 and 1980.

Table 10.12 to Table 10.22 show the converted flow data at San Esteban Dam Site. Fig. 10.1 to Fig.10.10 show the stream flow regime of San Esteban Dam Site.

2. EXCAVATION LINE OF THE DAM

Fig. 10.11 shows the planned excavation line for the dam. It was estimated that the depth of the weak rock is 5 meters.

3. STABILITY ANALYSIS OF DAM

Table 10.23 and Table 10.24 show the stability analysis of concrete gravity section and rock fill section of the dam.

4. COST ESTIMATE OF DAM

Table 10.25 shows the volume calculation and the cost of September 15 Dam and Table 10.26 shows the volume calculation and cost estimate of San Esteban Dam.

5. COST ALLOCATION CONCEPT OF MULTI-PURPOSE DAM

For the cost allocation of San Esteban Dam, Alternative Project Cost Method was adopted. In this method, alternative project cost is defined as " the cost assumed to be required for independently installing facilities or structures having a equal benefit to joint facilities."

The concept of the allocation is shown in Fig. 10.12.

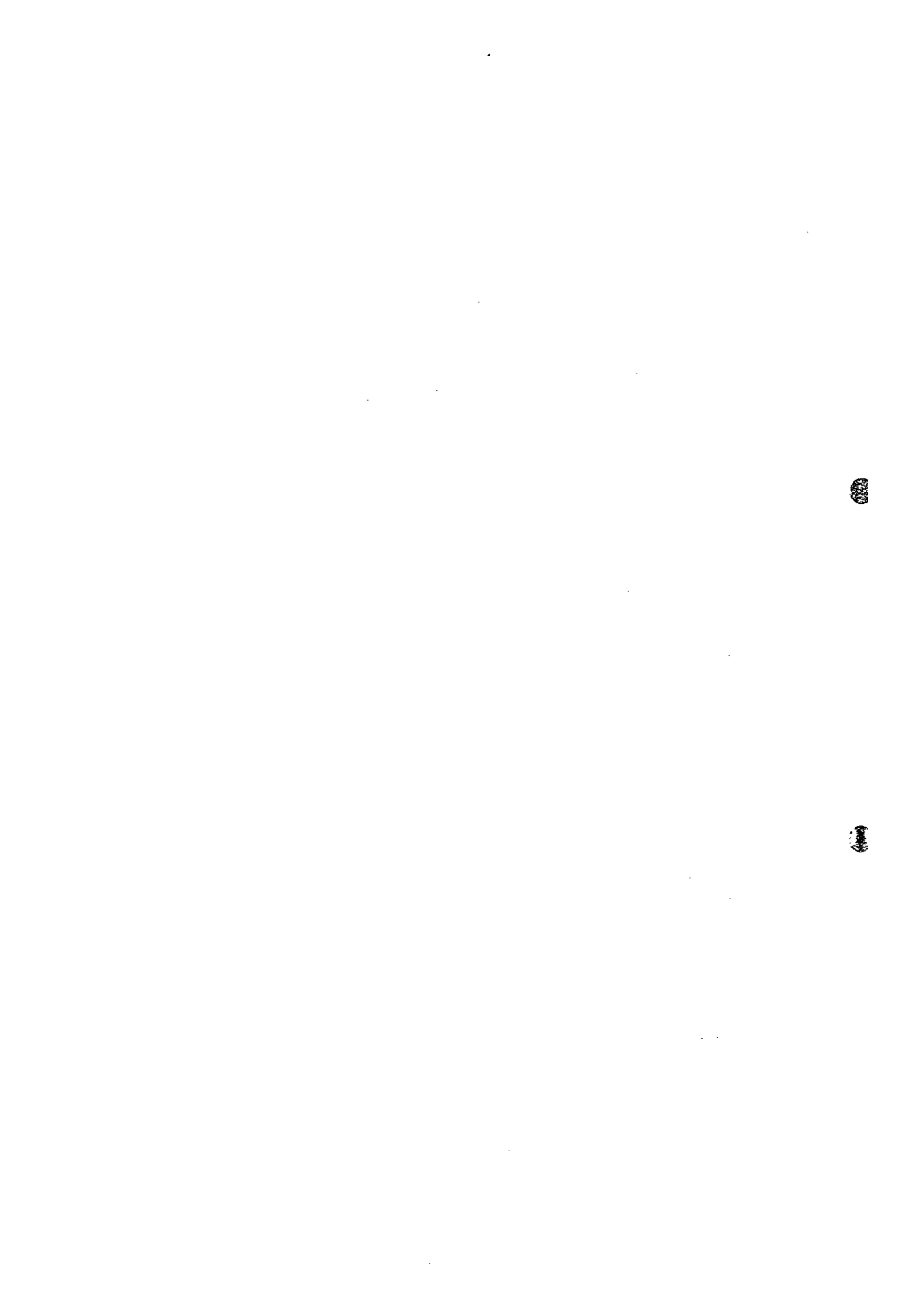


Table 10.1 DAILY DISCHARGE AT VILLERIAS(1970)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1					2.19	4.83	8.48	96.2	43.4	64.8	20.2	5.78
2					2.4	14.3	6.68	176	38.9	169	23.8	5.78
3					4.51	14.4	7.99	74.9	54.8	209	16	5.75
4					3.91	36.6	14.6	32.8	198	97.9	14.2	5.64
5					3.09	8.8	11.4	39.7	145	58.2	13.2	5.61
6					2.93	4.61	10.8	48.2	56.9	69.6	12.5	5.53
7					2.76	3.5	8.08	79	35.1	42.9	11.8	5.56
8					2.6	2.67	5.82	33	60.7	48.8	11.6	5.31
9					2.4	2.82	4.83	23.1	42	50.3	11.6	5.18
10					2.62	2.85	4.67	20.4	44.8	71.3	10.1	5.4
11					2.58	38.6	9.44	16.8	43.6	71.6	8.97	5.72
12					2.54	88.6	36.6	35.2	33.5	209	8.93	5.67
13					2.75	17.7	32	35.6	53.1	66.2	9.73	5.53
14					3.77	34.4	32.5	26	32.4	45.9	8.65	5.61
15					3.07	62.7	28.5	16.9	38.3	66.4	11.6	5.42
16					9.29	90.9	25.6	13.8	49.2	31.5	8.52	5.65
17					10.2	59.1	15	15.4	25.2	24.6	8.03	8.74
18					5.15	29.8	13.4	12.8	20.5	23.9	7.9	5.53
19					3.98	72.7	8.72	16.4	39.1	34	7.56	4.8
20					3.43	24.1	33.7	11	19.8	29	7.36	4.6
21					3.15	188	36	9.84	139	21.2	7.22	4.57
22					3.14	91.1	22.3	8.64	43.9	25.2	7.42	4.35
23					3.06	81	15	7.49	57.4	20.6	6.93	4.27
24					3.14	22	29.6	9.92	137	24.3	6.76	4.2
25					7.23	22	32.7	30.6	38.6	17.7	6.67	4
26					40.4	14.7	52.6	72.3	36	17.7	6.53	4.05
27					85	11	74.6	26.1	51.4	20.5	6.34	3.95
28					66.9	9.36	48.6	50.7	63.7	17.4	6.35	3.81
29					42.1	11.2	46.6	35.4	146	15.7	6.26	3.93
30					44.3	16.4	117	24.3	189	24.9	5.83	3.93
31					10.8		97.2	28.1		38.1		3.81
Total					385.39	1080.74	891.01	1126.59	1976.3	1727.2	298.56	157.68
Average					12.43	36.02	28.74	36.34	65.88	55.72	9.95	5.09

Table 10.2 DAILY DISCHARGE AT VILLERIAS(1971)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	3.91	2.42	2.46	2.11	2.21	6.70	6.03	91.20	166.00	97.50	16.90	5.39
2	4.12	2.54	2.42	2.52	2.22	9.09	4.86	15.00	64.70	26.80	15.50	6.20
3	4.08	2.44	2.30	2.54	2.23	6.77	2.93	14.90	129.00	24.80	14.40	6.25
4	4.08	2.30	2.46	3.90	1.74	13.00	2.81	23.70	51.30	132.00	13.70	6.33
5	3.81	2.27	2.36	3.43	2.18	42.10	2.85	9.61	32.70	38.00	13.30	4.89
6	3.84	2.31	2.28	3.24	1.97	23.90	2.94	7.74	28.90	116.00	14.90	4.82
7	3.70	2.42	2.38	2.90	1.97	8.03	3.55	7.81	32.30	98.70	11.60	4.64
8	3.69	2.34	2.28	1.98	1.97	36.20	3.03	12.40	45.40	42.70	10.70	4.64
9	3.62	2.41	2.19	1.62	2.05	21.50	3.30	17.60	49.40	53.40	10.40	4.64
10	3.50	2.40	2.10	1.54	2.10	7.90	3.17	7.46	46.80	26.20	9.78	4.42
11	3.62	2.24	2.11	1.46	2.11	24.10	3.11	6.65	59.30	29.20	8.98	4.13
12	3.61	2.32	2.08	1.34	2.07	160.00	5.84	7.29	34.60	62.10	8.76	4.03
13	3.33	2.64	2.15	1.35	2.43	47.40	4.76	103.00	24.40	54.70	8.47	3.79
14	3.37	2.42	2.16	1.66	3.28	21.70	5.43	10.90	20.20	102.00	8.10	4.54
15	3.39	2.62	2.15	2.29	2.63	14.20	6.90	8.38	17.30	62.50	7.77	4.26
16	3.48	2.70	2.08	2.31	6.31	16.80	6.19	38.20	13.10	84.10	7.58	3.35
17	3.37	2.80	2.20	2.35	6.80	17.40	29.40	121.00	11.60	76.70	7.50	3.39
18	3.46	2.80	2.15	2.41	73.70	8.65	15.60	51.50	10.20	66.20	7.58	4.17
19	3.46	2.62	2.12	2.37	8.87	7.23	7.27	62.70	13.10	58.90	7.55	3.23
20	3.33	2.54	2.14	2.34	5.43	10.20	5.68	56.20	12.20	50.60	7.34	3.23
21	3.29	2.64	1.63	2.44	4.13	6.64	4.86	58.80	67.90	120.00	7.81	4.03
22	3.05	2.82	2.16	2.20	4.14	5.68	3.90	71.00	23.60	62.20	10.70	3.96
23	3.12	2.72	2.11	1.99	4.16	5.03	3.63	65.70	18.80	56.70	8.38	4.03
24	3.26	2.58	2.07	1.99	7.36	4.83	4.05	44.90	64.60	63.30	8.01	4.14
25	3.22	2.66	2.03	2.07	6.31	4.81	9.48	62.80	49.60	40.10	6.87	4.03
26	3.01	2.62	2.06	1.96	4.54	4.38	16.40	59.50	46.20	27.70	6.54	4.03
27	2.90	2.50	1.98	1.99	4.47	4.07	8.57	106.00	34.10	26.70	6.37	4.03
28	2.86	2.58	2.06	2.06	4.66	5.09	9.05	105.00	41.10	23.60	6.34	3.94
29	2.70		2.06	2.17	12.00	8.12	15.60	86.60	25.30	38.90	5.93	3.74
30	2.74		2.14	2.16	9.27	7.64	6.29	133.00	70.70	27.40	5.74	3.78
31	2.82		2.03		7.01		30.90	106.00		18.90		3.74
Total	105.74	70.67	66.90	66.69	202.32	559.16	238.38	1572.54	1304.40	1808.60	283.50	133.79
Average	3.41	2.52	2.16	2.22	6.53	18.64	7.69	50.73	43.48	58.34	9.45	4.32

Table 10.3 DAILY DISCHARGE AT VILLERIAS(1972)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	
1	3.66	2.64	2.26	1.54	2.58	7.53	4.58	4.68	6.32	66.80	7.44	3.56
2	3.62	2.71	2.23	1.43	2.55	7.85	4.07	4.38	10.30	63.00	12.90	3.48
3	3.66	2.83	2.35	1.26	2.43	5.86	3.76	3.91	10.50	27.50	7.54	3.44
4	3.58	2.74	1.74	1.18	3.56	4.92	3.65	3.54	11.60	28.80	9.14	3.22
5	3.44	1.99	1.55	0.99	4.57	12.00	3.48	3.26	9.33	55.80	7.79	3.18
6	3.42	2.64	1.58	0.90	6.00	26.40	3.52	3.10	13.10	93.90	6.75	3.20
7	3.37	2.69	1.50	1.31	3.40	34.00	3.14	2.96	23.80	49.60	6.10	3.18
8	3.53	2.72	1.57	1.65	5.58	31.70	3.40	2.96	11.10	108.00	12.40	3.03
9	2.84	2.76	1.46	1.66	6.25	20.00	2.94	3.08	7.79	35.30	6.55	2.93
10	3.51	2.07	1.29	1.22	7.95	72.60	2.75	3.81	6.41	26.60	5.76	2.89
11	2.87	2.13	1.18	1.14	16.10	16.40	2.79	5.95	5.73	18.60	5.70	2.93
12	3.54	2.57	1.10	1.31	6.38	25.00	2.75	4.33	5.09	17.10	6.42	2.79
13	3.40	1.93	1.49	1.84	5.06	19.40	2.62	4.11	5.34	19.60	8.10	2.87
14	2.68	2.44	1.58	1.96	10.20	11.10	2.58	7.51	4.77	19.20	10.30	2.85
15	2.51	2.34	1.61	1.93	5.96	8.35	2.51	5.08	4.09	13.50	6.72	2.56
16	2.37	2.64	1.58	2.00	10.10	8.44	2.51	4.00	3.77	13.10	7.67	2.56
17	2.14	2.59	1.64	7.71	18.00	8.10	2.51	3.66	9.41	12.80	7.64	2.47
18	2.48	1.62	1.58	12.60	8.21	6.78	2.13	3.66	5.53	13.50	6.18	2.47
19	2.38	1.29	1.94	4.76	5.85	6.02	3.74	4.08	27.60	47.90	5.54	2.47
20	2.48	1.33	1.69	4.00	20.70	5.51	7.25	3.44	14.50	77.50	4.99	2.45
21	3.20	1.37	1.54	3.39	18.00	43.40	10.50	3.32	9.47	27.00	4.63	2.58
22	3.14	1.33	1.51	2.38	7.68	63.70	14.90	3.32	8.39	13.70	4.56	2.73
23	3.18	1.38	1.59	3.35	5.91	16.90	9.84	3.46	10.10	11.10	4.46	2.79
24	3.06	1.77	1.54	3.45	4.99	11.70	6.96	6.79	28.80	9.74	4.56	2.81
25	3.00	1.76	1.57	2.98	4.61	11.90	8.11	4.71	69.80	9.50	4.36	2.83
26	2.91	1.64	1.54	2.79	7.53	8.60	13.20	9.25	44.60	9.05	4.29	2.72
27	2.89	1.70	1.49	2.79	11.30	7.33	26.60	26.80	49.40	8.50	4.13	2.55
28	2.93	1.76	1.62	2.67	12.00	6.30	13.80	20.40	45.80	7.87	3.88	2.60
29	2.79		1.57	2.89	58.50	5.56	8.10	40.30	52.00	13.80	3.79	2.60
30	2.76		1.62	2.83	11.20	4.92	6.40	11.00	34.10	8.18	3.52	2.77
31	2.76		1.64		8.33		5.50	8.07		7.36		2.93
Total	94.10	59.38	50.15	81.91	301.48	518.27	190.59	218.92	528.54	933.90	193.61	88.44
Average	3.04	2.12	1.62	2.73	9.73	17.28	6.15	7.06	17.62	30.13	6.45	2.85

Table 10.4 DAILY DISCHARGE AT VILLERIAS(1973)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	2.93	1.85	2.03	2.38	3.26	6.05	14.20	18.90	64.60	55.60	23.10	6.90
2	2.93	1.83	1.83	2.30	2.93	4.89	30.70	21.40	61.30	37.90	22.10	6.79
3	2.93	1.95	1.69	1.90	2.80	4.33	22.60	20.60	48.00	31.10	21.00	6.85
4	2.71	1.83	1.60	2.00	2.66	25.10	11.80	19.00	99.40	29.00	19.00	6.66
5	2.66	1.81	1.55	2.11	2.15	65.40	9.69	13.00	66.90	46.60	18.20	6.52
6	2.69	2.06	1.53	1.81	1.96	35.20	9.00	21.50	37.00	112.00	17.30	6.63
7	2.53	1.81	1.45	1.94	1.87	8.56	8.40	38.10	29.20	69.10	15.90	6.60
8	2.44	1.79	1.46	1.92	2.08	6.28	7.73	13.60	22.30	191.00	14.80	6.66
9	2.17	1.67	1.53	2.00	2.04	45.40	7.30	11.30	19.80	101.00	14.10	6.44
10	2.15	1.67	1.53	1.82	2.27	76.80	6.66	42.60	17.20	122.00	13.80	6.15
11	1.92	1.67	1.56	1.97	2.96	44.20	6.30	50.70	35.20	78.60	13.70	5.86
12	2.07	1.50	1.54	1.90	2.52	82.70	8.58	31.80	27.30	137.00	13.10	5.94
13	1.93	1.54	1.39	1.88	2.57	72.10	13.00	17.60	42.60	123.00	11.90	5.84
14	1.96	1.53	1.36	1.62	2.46	96.80	7.61	13.70	33.70	94.60	11.60	5.81
15	2.16	1.63	1.64	1.41	2.45	101.00	6.87	15.10	70.10	52.90	11.10	5.97
16	2.00	1.63	1.63	1.74	2.72	83.20	8.68	18.00	243.00	37.80	10.90	5.94
17	2.09	1.56	1.76	1.73	2.62	239.00	6.57	13.20	137.00	51.90	10.70	5.66
18	2.00	1.63	1.72	1.75	5.60	89.60	6.14	12.10	136.00	175.00	10.00	5.48
19	1.93	1.63	1.50	2.01	11.00	163.00	9.45	12.10	125.00	80.90	9.83	5.44
20	2.00	1.57	1.52	2.02	8.00	56.30	36.30	15.90	131.00	52.40	9.54	5.48
21	2.00	1.56	2.07	2.29	20.60	172.00	29.60	16.20	179.00	88.40	9.36	5.46
22	2.00	1.60	2.05	2.70	10.60	50.90	32.80	12.40	70.50	141.00	11.80	5.15
23	1.97	1.60	2.03	4.74	14.30	14.90	53.50	23.80	54.50	140.00	10.50	5.25
24	2.00	1.66	2.10	5.36	14.20	11.10	56.70	35.20	35.80	207.00	9.26	5.44
25	1.84	1.73	2.20	3.97	7.97	10.90	20.00	56.20	73.40	129.00	8.58	5.41
26	1.83	1.80	2.16	3.40	6.63	51.40	47.70	37.40	38.00	109.00	8.39	5.20
27	1.91	1.90	2.14	3.13	5.45	49.70	76.20	59.80	67.90	74.00	8.07	4.95
28	1.96	1.95	2.03	12.60	23.70	56.80	17.20	81.00	111.00	51.80	7.84	4.70
29	1.91		1.96	7.27	28.30	28.80	38.10	68.60	87.30	52.30	7.54	4.65
30	1.84		2.15	4.17	12.80	15.90	63.80	113.00	71.00	34.50	7.21	4.65
31	1.92		2.41		8.63		19.20	169.00		25.40		4.65
Total	67.38	47.96	55.12	87.84	220.10	1768.31	692.38	1092.80	2235.00	2731.80	380.22	179.13
Average	2.17	1.71	1.78	2.93	7.10	58.94	22.33	35.25	74.50	88.12	12.67	5.78

Table 10.5 DAILY DISCHARGE AT VILLERIAS(1974)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	4.45	2.75	1.73	2.38	1.44	2.44	24.90	5.36	31.50	25.90	5.64	2.48
2	4.49	2.70	1.62	2.36	1.44	15.30	24.50	4.12	20.40	61.50	5.39	2.57
3	4.40	2.79	1.66	2.19	1.75	21.40	26.20	3.62	18.30	200.00	4.95	2.39
4	4.45	2.88	1.60	2.20	1.70	13.60	11.60	3.60	10.50	88.60	4.95	2.44
5	4.40	2.87	1.51	2.28	1.73	5.58	8.05	5.23	25.40	48.10	4.70	2.38
6	4.05	2.62	1.48	2.23	1.92	4.23	6.62	3.89	17.60	32.70	4.63	2.47
7	4.05	2.24	1.70	2.15	2.25	3.48	5.77	3.27	18.20	25.20	4.68	2.47
8	4.07	2.23	1.87	2.00	2.39	3.17	5.21	3.26	60.70	21.20	4.78	2.41
9	4.12	2.21	2.02	2.01	2.54	2.80	4.84	2.99	24.20	21.80	4.70	2.27
10	3.97	2.21	1.93	2.06	2.29	2.80	5.02	2.73	32.20	16.90	4.70	2.27
11	3.99	2.26	2.10	2.08	2.17	3.37	7.75	2.97	21.70	13.40	4.63	2.33
12	4.14	2.13	1.91	2.10	2.09	7.11	6.86	4.50	19.10	16.90	4.70	2.63
13	4.03	2.06	1.92	2.18	2.12	28.70	8.06	3.78	21.10	46.10	4.39	2.64
14	3.78	2.09	1.86	2.14	2.06	13.70	12.30	5.27	23.20	26.10	4.31	2.50
15	3.58	1.99	2.06	2.10	2.82	5.02	5.79	9.41	13.20	43.20	3.99	2.53
16	3.46	1.94	2.58	1.94	7.16	4.37	4.47	4.26	11.60	21.60	3.94	2.48
17	3.48	2.11	2.75	1.94	8.06	7.02	7.31	3.42	11.40	24.30	3.92	2.35
18	3.45	2.08	2.44	1.99	2.95	5.45	5.35	2.87	11.10	14.80	3.70	2.25
19	3.59	1.97	2.12	2.00	12.60	5.07	4.84	2.83	103.00	12.70	3.57	2.18
20	3.54	2.04	1.88	1.93	3.93	11.70	6.55	2.73	434.00	11.60	3.40	2.09
21	3.76	2.04	1.85	2.00	16.60	24.90	4.73	2.52	166.00	11.30	3.31	2.02
22	3.48	2.02	1.92	2.09	20.10	17.80	4.29	2.66	51.50	10.30	3.22	1.99
23	3.46	2.00	1.84	2.15	5.17	19.20	5.03	2.72	55.00	9.53	3.12	2.02
24	3.44	1.94	1.88	2.19	4.81	9.09	4.51	7.35	31.20	9.22	3.09	1.71
25	3.13	1.88	1.78	2.31	3.60	22.90	4.05	23.00	22.20	8.88	2.95	1.84
26	3.14	1.62	1.83	2.26	3.01	19.80	3.62	19.90	29.30	8.26	2.80	1.99
27	3.07	1.78	1.61	2.19	3.49	11.90	3.40	12.50	23.20	8.23	2.62	1.86
28	3.18	1.73	1.54	2.34	2.90	9.82	3.12	19.40	17.10	7.99	2.57	1.73
29	2.78		1.44	2.32	2.60	7.79	3.02	27.90	23.60	6.72	2.57	1.62
30	2.94		2.53	2.44	3.21	36.50	2.94	17.90	35.70	6.52	2.54	1.59
31	2.78		2.36		2.63		10.50	12.30		6.19		1.73
Total	114.65	61.18	59.32	64.55	133.53	346.01	241.20	228.26	1383.20	865.74	118.44	68.23
Average	3.70	2.19	1.91	2.15	4.31	11.53	7.78	7.36	46.11	27.93	3.95	2.20

Table 10.6 DAILY DISCHARGE AT VILLERIAS(1975)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1.75	1.41	1.44	1.11	2.52	14.24	2.32	33.86	39.93	145.75	27.90	6.56
2	1.77	1.51	1.59	1.10	2.64	27.27	2.10	13.91	58.67	75.51	87.11	6.06
3	1.74	1.58	1.59	0.98	3.52	13.62	2.23	11.41	45.05	53.67	64.16	5.89
4	1.66	1.51	1.54	1.07	3.28	21.05	2.68	42.72	44.65	45.55	34.93	5.60
5	1.69	1.42	1.54	0.98	3.26	8.74	2.76	55.44	99.89	43.35	26.47	5.35
6	1.69	1.46	1.49	1.02	3.28	6.74	3.56	13.23	118.42	63.77	25.88	5.12
7	1.53	1.42	1.39	1.18	3.25	8.49	20.95	10.48	39.61	75.61	47.35	4.90
8	1.50	1.37	1.57	1.17	3.08	8.16	25.05	34.05	74.80	40.70	37.71	4.86
9	1.58	1.38	1.58	1.19	3.23	6.49	6.84	25.74	65.20	61.17	39.67	4.75
10	2.03	1.32	1.52	1.23	3.09	5.49	4.75	15.63	128.09	34.53	38.95	4.45
11	1.99	1.45	1.57	1.30	2.93	4.63	3.95	11.32	204.38	29.91	42.17	4.25
12	2.02	1.40	1.52	1.35	2.86	5.02	3.46	34.28	61.99	25.12	32.18	4.13
13	2.07	1.46	1.61	1.45	2.79	4.56	3.00	11.64	33.62	34.83	28.06	3.97
14	1.87	1.39	1.49	1.52	2.90	3.77	2.67	8.63	34.05	79.85	19.38	3.84
15	1.89	1.48	1.54	1.07	2.75	3.63	2.45	7.12	46.08	31.22	16.10	3.91
16	1.88	1.53	1.40	1.25	3.90	3.63	2.39	32.26	22.92	27.55	14.76	3.43
17	1.83	1.53	1.45	1.30	2.68	3.44	9.58	63.63	44.81	24.85	13.76	3.40
18	1.77	1.59	1.32	1.04	4.48	3.29	5.10	85.84	29.22	50.10	13.06	3.35
19	1.83	1.51	1.08	1.50	3.10	3.59	3.27	81.42	28.57	76.76	12.18	3.39
20	1.85	1.45	1.19	1.65	2.73	4.41	2.84	72.69	28.61	46.85	11.72	3.07
21	1.75	1.54	1.13	1.67	2.48	9.32	6.15	26.68	44.43	25.58	11.72	3.19
22	1.60	1.49	1.20	1.63	7.10	6.92	21.52	13.75	39.81	24.06	12.89	3.12
23	1.51	1.49	1.02	1.55	4.59	15.22	92.66	30.09	107.78	19.32	9.21	3.24
24	1.63	1.47	0.95	1.58	4.06	6.32	27.89	27.98	365.00	16.93	8.97	2.94
25	1.58	1.31	0.73	1.66	5.39	4.61	43.40	18.29	65.84	16.13	8.43	2.96
26	1.59	1.29	1.01	1.69	9.20	3.61	45.98	11.23	43.10	31.97	7.71	3.06
27	1.54	1.46	1.05	1.60	21.64	2.78	10.81	10.26	36.96	43.81	7.33	2.85
28	1.50	1.41	1.17	1.90	23.56	2.68	15.32	27.36	32.43	29.27	7.39	3.06
29	1.41		1.07	2.39	39.97	4.14	7.11	19.95	36.54	19.34	7.15	2.85
30	1.54		1.13	2.54	43.52	2.74	5.44	28.58	72.45	24.03	6.84	2.94
31	1.56		1.17		27.46		4.56	45.47		21.83		2.66
Total	53.15	40.63	41.05	42.67	251.21	218.38	392.57	924.90	2092.90	1338.90	721.13	123.12
Average	1.71	1.45	1.32	1.42	8.10	7.28	12.66	29.84	69.76	43.19	24.04	3.97

Table 10.7 DAILY DISCHARGE AT VILLERIAS(1976)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	2.62	3.94	2.28	2.08	8.29	2.98	18.43	3.61	5.24	14.90	5.46	2.60
2	2.76	4.12	2.03	1.80	26.95	33.48	16.47	3.61	5.10	13.99	5.22	2.51
3	2.41	3.59	1.85	1.87	8.98	20.48	18.36	3.83	7.19	22.42	4.95	2.17
4	2.13	3.84	1.79	2.10	6.65	76.46	14.15	4.33	23.69	17.62	4.61	2.20
5	3.12	3.92	1.88	2.30	4.73	265.67	24.34	3.90	21.94	13.54	4.24	2.59
6	3.99	3.39	2.02	2.23	3.27	131.50	34.28	3.40	9.65	19.07	4.21	2.52
7	4.31	3.41	2.15	2.42	2.51	49.37	40.94	3.18	8.48	26.14	3.98	2.47
8	4.95	2.93	2.18	2.55	1.95	25.79	18.39	2.78	6.01	36.20	3.74	2.09
9	4.74	2.90	1.93	2.83	1.43	24.97	27.58	2.44	5.24	19.18	3.74	2.02
10	4.55	3.17	1.99	8.02	1.07	32.04	15.28	2.16	6.15	17.20	3.40	1.95
11	4.95	3.23	1.94	3.35	0.83	44.83	12.84	2.37	10.64	15.92	3.40	2.00
12	5.04	2.57	1.96	2.33	0.71	48.00	11.56	2.70	8.01	15.49	3.19	1.90
13	4.68	2.26	1.86	2.46	0.61	51.00	10.43	5.72	7.72	14.09	3.44	2.05
14	4.90	2.27	1.92	2.35	0.65	54.52	29.73	11.69	5.70	13.74	3.59	1.72
15	4.81	2.30	2.00	2.53	0.96	43.76	22.19	4.89	10.91	13.22	3.48	1.75
16	4.60	2.17	1.73	2.87	1.69	36.71	9.30	4.27	5.52	37.66	3.65	1.96
17	4.60	1.90	1.77	2.99	2.25	27.89	8.75	4.40	16.13	64.80	4.37	2.24
18	5.30	2.01	1.67	4.70	9.54	50.26	8.58	6.65	6.82	26.49	4.81	1.91
19	5.35	1.93	1.49	4.07	6.89	40.74	8.08	4.78	5.20	15.28	4.26	1.97
20	5.26	1.79	1.74	7.28	5.49	28.06	7.63	5.02	4.63	25.70	4.00	1.94
21	5.12	1.81	1.57	4.32	4.14	44.79	6.90	10.09	5.54	18.06	3.77	2.00
22	5.36	2.06	1.77	4.33	3.58	102.00	6.32	5.22	8.21	11.16	3.62	1.95
23	5.22	2.06	1.65	3.94	3.45	86.32	5.58	5.34	39.61	11.01	3.23	1.98
24	4.89	2.01	1.63	3.26	3.45	83.49	5.22	8.62	33.16	10.01	3.02	1.91
25	4.97	1.92	1.63	2.87	3.49	97.57	5.08	17.04	18.10	8.88	2.89	1.98
26	4.77	2.00	1.97	4.84	13.37	33.60	4.90	18.58	75.06	8.35	3.05	1.98
27	4.67	1.97	1.98	3.59	12.02	63.19	4.54	6.63	45.84	7.73	2.83	1.84
28	4.55	2.10	2.09	6.23	7.51	33.80	4.06	6.83	20.46	7.41	2.57	2.00
29	4.12		2.28	14.19	4.92	23.87	3.84	16.24	21.93	6.75	2.59	1.86
30	4.35		1.82	33.56	3.74	22.28	4.00	11.84	18.62	6.12	2.52	1.78
31	3.97		1.98		3.36		3.67	6.39		5.78		1.80
Total	137.04	73.59	58.54	144.27	158.45	1679.92	411.43	198.54	466.48	543.89	111.82	63.62
Average	4.42	2.63	1.89	4.81	5.11	56.00	13.27	6.40	15.55	17.54	3.75	2.05

Table 10.8 DAILY DISCHARGE AT VILLERIAS(1977)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1.58	1.40	1.26	1.12	4.72	64.35	4.05	6.91	9.31	13.24	9.27	2.41
2	1.57	1.40	1.25	1.11	3.46	16.56	3.68	10.52	14.75	13.46	5.10	2.57
3	1.57	1.39	1.25	1.11	8.12	19.18	3.46	4.54	6.84	11.84	14.72	2.99
4	1.56	1.38	1.24	1.10	10.33	50.17	3.29	3.46	12.57	14.82	16.20	3.02
5	1.56	1.38	1.24	1.10	10.11	74.55	3.14	2.89	5.33	7.28	11.35	2.83
6	1.55	1.37	1.23	1.09	4.40	57.04	2.97	3.19	4.19	5.80	7.73	2.67
7	1.54	1.37	1.23	1.09	4.11	31.88	2.80	22.03	3.71	5.75	6.07	2.65
8	1.54	1.36	1.22	1.09	2.67	48.20	2.65	13.37	3.51	4.50	5.05	2.58
9	1.53	1.36	1.22	1.08	2.42	55.32	2.49	5.37	3.37	10.99	4.39	2.43
10	1.53	1.35	1.21	1.08	5.12	19.21	2.33	4.06	3.10	7.37	3.93	2.42
11	1.52	1.35	1.21	1.07	4.90	17.29	2.20	9.60	2.82	6.38	3.68	2.42
12	1.51	1.34	1.21	1.07	3.43	10.03	2.20	15.51	2.65	5.99	3.49	2.37
13	1.51	1.34	1.20	1.07	3.24	6.66	2.18	6.19	3.09	6.14	3.18	2.29
14	1.50	1.33	1.20	1.06	4.52	7.44	2.18	4.48	10.74	8.14	3.12	2.31
15	1.50	1.33	1.19	1.06	5.06	23.47	2.28	4.02	22.81	3.81	2.94	2.21
16	1.49	1.32	1.19	1.05	4.79	81.29	2.25	4.10	32.00	3.26	2.84	2.30
17	1.48	1.32	1.18	1.05	6.87	10.41	2.38	8.68	22.06	3.06	2.80	2.23
18	1.48	1.31	1.18	1.04	3.89	8.69	2.55	15.13	11.47	2.96	2.96	2.25
19	1.47	1.31	1.17	1.04	2.84	9.56	2.37	5.16	7.27	2.82	5.26	3.32
20	1.47	1.30	1.17	1.04	2.92	8.03	2.17	3.92	5.74	3.02	6.45	2.46
21	1.46	1.30	1.16	1.03	2.41	10.40	2.07	7.96	5.45	2.86	3.91	2.42
22	1.46	1.29	1.16	1.03	2.78	11.09	2.07	13.80	11.30	3.02	3.53	2.40
23	1.45	1.29	1.16	1.02	5.44	5.98	2.09	20.67	5.64	7.24	3.25	2.29
24	1.45	1.28	1.15	1.02	3.01	5.52	2.13	19.95	35.61	6.37	3.06	2.31
25	1.44	1.28	1.15	1.02	2.12	5.18	2.40	14.83	49.32	6.68	2.96	2.25
26	1.43	1.27	1.14	1.01	2.05	4.98	2.21	8.65	17.76	5.44	2.71	2.33
27	1.43	1.27	1.14	1.01	2.46	6.49	2.14	11.33	15.08	6.04	2.48	2.24
28	1.42	1.26	1.13	1.01	2.13	5.51	1.99	20.04	23.95	4.92	2.53	2.20
29	1.42		1.13	1.00	6.87	5.48	1.93	7.16	14.58	19.00	2.29	2.14
30	1.41		1.12	1.00	3.68	6.29	1.92	5.89	12.72	8.27	2.27	2.18
31	1.41		1.12		34.90		2.72	6.88		5.36		2.14
Total	46.22	37.24	36.79	31.65	165.76	665.84	77.26	290.07	378.76	215.78	149.49	75.62
Average	1.49	1.33	1.19	1.05	5.35	22.19	2.49	9.36	12.63	6.96	4.98	2.44

Table 10.9 DAILY DISCHARGE AT VILLERIAS(1978)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1.41	1.29	1.19	1.09	1.83	11.36	18.01	8.48	72.54	41.86	6.52	2.72
2	1.40	1.28	1.18	1.08	1.71	9.23	20.09	5.92	59.09	72.95	9.75	2.83
3	1.40	1.28	1.18	1.08	1.57	11.72	28.01	4.88	37.33	64.27	11.46	2.72
4	1.39	1.28	1.18	1.08	1.27	20.43	7.16	10.09	57.73	89.86	6.96	2.87
5	1.39	1.27	1.17	1.07	2.94	15.40	43.36	22.28	54.09	31.42	6.67	2.67
6	1.39	1.27	1.17	1.07	2.64	8.60	9.17	5.74	123.20	52.40	6.50	2.58
7	1.38	1.26	1.17	1.07	2.11	23.01	9.22	18.11	153.30	46.84	6.18	2.72
8	1.38	1.26	1.16	1.06	3.63	9.40	6.58	26.40	55.27	23.26	6.83	3.01
9	1.37	1.26	1.16	1.06	2.05	10.82	6.20	15.51	38.49	22.70	14.10	3.28
10	1.37	1.25	1.16	1.06	1.69	4.71	4.61	6.18	24.35	16.69	7.79	4.37
11	1.37	1.25	1.15	1.05	1.69	4.06	4.79	4.30	20.33	20.85	8.72	3.90
12	1.36	1.25	1.15	1.05	1.50	3.66	14.71	4.38	21.80	40.48	6.15	3.26
13	1.36	1.24	1.15	1.05	1.43	2.69	93.04	6.66	29.53	16.63	5.14	3.06
14	1.35	1.24	1.14	1.05	1.32	2.98	33.82	3.90	47.31	110.58	4.65	2.90
15	1.35	1.24	1.14	1.04	1.35	5.59	16.43	2.94	17.04	82.59	4.95	2.77
16	1.35	1.23	1.14	1.04	1.32	3.03	20.30	2.58	13.72	106.17	4.89	2.57
17	1.34	1.23	1.13	1.04	1.23	1.90	55.57	2.39	16.09	138.68	4.29	2.55
18	1.34	1.22	1.13	1.03	1.25	1.54	18.59	27.73	17.29	59.16	3.68	2.50
19	1.34	1.22	1.13	1.03	2.63	1.68	20.37	20.02	101.12	36.76	3.43	2.43
20	1.33	1.22	1.12	1.03	50.67	8.10	11.93	6.71	118.37	28.51	3.56	2.37
21	1.33	1.21	1.12	1.42	8.40	7.79	49.29	17.88	170.09	22.84	3.68	2.45
22	1.32	1.21	1.12	1.30	5.25	10.80	33.90	9.75	54.19	19.67	3.74	2.38
23	1.32	1.21	1.11	1.46	3.88	5.25	26.87	13.61	88.99	17.37	3.63	2.47
24	1.32	1.20	1.11	1.31	3.98	3.57	12.21	39.42	117.86	17.75	3.76	2.42
25	1.31	1.20	1.11	2.62	3.37	2.60	8.47	32.20	109.81	13.87	3.68	2.42
26	1.31	1.20	1.10	5.35	6.08	2.07	6.06	15.14	75.80	13.27	3.35	2.44
27	1.30	1.19	1.10	6.51	8.59	4.69	6.19	20.17	102.31	14.72	3.42	2.33
28	1.30	1.19	1.10	3.18	10.59	2.46	26.09	39.52	82.66	16.59	3.05	2.54
29	1.30		1.09	2.19	13.64	1.94	8.60	43.46	131.33	11.05	2.99	2.66
30	1.29		1.09	1.79	6.40	6.82	9.43	119.68	78.96	9.21	2.95	2.46
31	1.29		1.09		7.49		27.66	125.86		8.48		2.47
Total	41.75	34.64	35.23	48.23	163.52	207.88	656.74	681.87	2089.99	1267.49	166.45	85.09
Average	1.35	1.24	1.14	1.61	5.27	6.93	21.19	22.00	69.67	40.89	5.55	2.74

Table 10.10 DAILY DISCHARGE AT MOSCOSO(1979)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	2.56	1.79	1.64	1.50	4.51	30.58	35.50	11.83	61.01	19.46	18.92	6.29
2	2.59	1.75	1.38	1.42	3.39	18.17	55.18	62.16	13.52	35.82	37.64	6.27
3	2.43	1.76	1.42	1.42	3.51	12.80	61.63	30.35	107.34	47.24	72.98	6.35
4	2.20	1.73	1.53	1.36	12.84	117.52	107.48	67.10	71.46	43.49	28.18	6.17
5	2.13	1.71	1.57	1.38	6.39	65.16	35.97	20.10	45.91	27.60	21.89	5.72
6	2.06	1.63	1.57	1.29	5.93	23.71	103.48	13.07	46.62	25.59	19.30	5.60
7	2.10	1.63	1.51	1.47	5.78	14.85	35.98	10.93	75.28	21.23	17.62	5.57
8	2.16	1.59	1.46	1.60	4.62	43.03	22.84	9.66	52.54	106.05	16.25	5.48
9	2.02	1.54	1.51	1.57	4.08	22.07	21.86	9.02	41.01	93.94	15.10	5.36
10	1.89	1.53	1.42	1.57	3.75	20.27	18.36	8.19	77.82	75.61	14.23	5.61
11	1.87	1.69	1.48	1.46	3.59	14.17	65.05	6.84	57.93	65.38	13.40	5.38
12	1.80	1.73	1.51	1.42	4.39	12.70	44.30	6.24	139.23	61.22	12.49	5.26
13	1.81	1.68	1.42	1.42	3.76	12.01	24.47	5.74	118.08	42.44	12.17	4.94
14	1.80	1.63	1.45	1.48	15.19	74.55	23.49	6.68	80.60	40.63	11.26	4.72
15	1.73	1.68	1.42	1.51	6.24	54.71	14.43	5.90	48.81	47.77	10.09	4.69
16	1.75	1.75	1.42	1.51	4.68	56.37	12.26	6.61	40.21	70.04	9.45	4.56
17	1.58	1.79	1.38	1.46	3.87	17.82	10.73	12.87	70.02	50.09	9.19	4.47
18	1.53	1.74	1.27	1.42	3.25	11.71	12.63	15.35	62.70	84.67	8.65	4.37
19	1.61	1.79	1.27	1.53	2.94	9.40	22.76	29.43	40.63	68.95	8.38	4.29
20	1.41	1.67	1.27	4.27	2.80	8.91	11.23	57.21	31.50	85.85	8.15	4.10
21	1.61	1.65	1.27	5.68	2.78	7.67	10.49	80.85	38.33	90.85	7.94	4.23
22	1.53	1.63	1.27	3.14	2.64	11.98	26.49	69.30	28.30	51.80	7.77	4.41
23	1.48	1.75	1.27	7.02	2.38	8.11	14.97	26.93	22.30	61.01	7.24	4.60
24	1.67	1.76	1.38	14.69	2.16	23.15	10.90	25.26	19.78	48.39	6.75	4.54
25	1.93	1.83	1.42	5.45	4.16	9.44	9.19	27.16	20.14	31.23	6.62	4.44
26	1.97	1.69	1.42	6.15	2.59	6.21	37.03	16.46	74.65	24.88	6.52	4.28
27	1.91	1.61	1.42	3.99	4.35	5.28	49.65	13.74	58.24	24.22	6.46	4.16
28	2.02	1.70	1.43	10.68	7.09	4.59	15.06	13.64	33.20	20.66	6.46	4.06
29	2.01	1.68	1.68	38.59	4.45	21.43	28.40	21.23	38.16	24.81	6.57	4.03
30	1.91	1.69	1.69	6.74	11.13	25.34	15.76	47.78	38.67	32.27	6.36	4.07
31	1.87	1.57	1.55	6.32	6.32	11.10	149.24	149.24	155.33	155.33	155.33	155.33
Total	58.93	47.42	44.73	134.18	155.53	763.68	968.64	886.87	1653.97	1551.39	434.03	151.97
Average	1.90	1.69	1.44	4.47	5.02	25.46	31.25	28.61	55.13	50.04	14.47	4.90

Table 10.11 DAILY DISCHARGE AT MOSCOSO(1980)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	3.91	2.70	2.60	2.36	3.25	34.99	11.33	26.51	14.79	42.42	17.50	7.32
2	3.79	2.64	2.77	2.36	3.19	21.79	10.27	61.11	15.31	48.20	16.50	7.15
3	3.86	2.53	2.71	2.36	3.27	12.64	9.56	31.47	12.50	132.72	15.50	6.85
4	3.99	2.69	2.51	2.43	4.08	23.02	8.89	13.66	14.30	150.77	15.00	6.57
5	4.12	2.85	2.48	2.48	4.12	46.90	8.67	15.64	12.19	55.01	17.50	6.51
6	1.77	2.73	2.53	2.36	6.66	12.41	10.68	18.31	13.15	72.23	15.00	6.38
7	4.16	2.74	2.73	2.36	4.44	10.01	8.72	69.93	10.79	134.11	14.00	6.31
8	3.82	2.58	2.75	2.36	4.74	13.96	8.03	19.89	25.67	74.53	13.50	6.28
9	3.61	2.71	2.81	2.36	4.17	72.36	13.40	21.87	42.70	74.34	13.50	6.10
10	3.41	2.80	2.78	2.36	3.77	30.52	8.81	19.82	122.38	93.04	14.00	5.99
11	3.38	3.00	2.70	2.36	3.69	95.18	8.43	26.25	52.02	153.75	13.00	5.88
12	3.41	2.90	2.73	2.36	3.77	125.09	9.03	20.02	81.57	84.28	12.00	5.88
13	3.42	2.75	2.75	2.36	13.45	231.91	13.85	14.24	135.57	62.19	12.50	5.83
14	3.45	2.55	2.66	2.36	8.14	49.15	8.55	34.21	87.18	44.14	12.00	5.83
15	3.30	2.55	2.68	2.36	20.84	113.01	7.41	251.98	42.40	75.75	11.30	5.83
16	3.25	2.60	2.78	2.36	9.91	43.40	6.83	57.34	42.61	98.94	12.10	5.73
17	3.28	2.68	2.72	2.29	6.43	23.78	6.44	44.78	40.49	56.02	12.00	5.57
18	3.42	2.75	2.57	2.22	5.08	16.36	6.11	35.43	37.34	46.45	12.00	5.53
19	3.46	2.67	2.46	2.17	4.61	14.14	8.26	75.25	49.18	70.04	10.00	5.30
20	3.58	2.60	2.36	2.17	4.25	71.71	23.86	81.18	81.31	50.53	10.55	5.30
21	3.57	2.55	2.36	2.17	5.16	199.18	30.85	84.53	68.33	57.22	10.02	5.30
22	3.46	2.78	2.36	2.17	10.03	168.33	21.44	51.56	73.91	40.34	9.62	5.21
23	3.40	2.75	2.36	2.17	13.44	96.49	15.50	32.02	77.01	49.43	9.10	5.05
24	3.37	2.86	2.41	2.17	35.70	95.82	101.33	25.68	50.36	32.15	9.07	5.05
25	3.15	2.81	2.47	2.17	9.63	38.96	28.74	20.46	45.31	26.33	8.84	4.95
26	3.12	2.65	2.43	2.13	6.51	21.42	33.29	17.96	39.26	23.65	8.68	4.79
27	3.06	2.68	2.36	2.13	39.02	18.29	21.41	16.31	217.75	21.83	8.28	4.79
28	3.09	2.60	2.36	3.65	138.77	15.90	44.12	14.94	88.66	25.50	7.98	4.70
29	2.79		2.36	2.68	64.89	13.89	20.30	14.30	52.83	24.00	7.56	4.55
30	2.19		2.36	2.38	77.35	12.55	15.90	19.19	45.86	21.40	7.37	4.55
31	2.40		2.36		39.18		35.58	23.98		19.95		4.55
Total	103.98	75.71	79.25	70.61	561.55	1743.13	565.59	1264.85	1692.72	1961.24	355.96	175.61
Average	3.35	2.70	2.56	2.35	18.11	58.10	18.24	40.80	56.42	63.27	11.87	5.66

Table 10.12 DAILY DISCHARGE AT SAN ESTEBAN DAM SITE(1970)

UNIT: m³/s

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1					2.05	4.51	7.92	89.86	40.54	60.52	18.87	5.40
2					2.24	13.36	6.24	164.40	36.34	157.86	22.23	5.40
3					4.21	13.45	7.46	69.96	51.19	195.22	14.95	5.37
4					3.65	34.19	13.64	30.64	184.95	91.45	13.26	5.27
5					2.89	8.22	10.65	37.08	135.44	54.36	12.33	5.24
6					2.74	4.31	10.09	45.02	52.15	65.01	11.68	5.17
7					2.58	3.27	7.55	73.79	32.79	40.07	11.02	5.19
8					2.43	2.49	5.44	30.82	56.70	45.58	10.84	4.96
9					2.24	2.63	4.51	21.58	39.23	46.98	10.84	4.84
10					2.45	2.66	4.36	19.05	41.85	66.60	9.43	5.04
11					2.41	36.05	8.82	15.69	40.73	66.88	8.38	5.34
12					2.37	82.76	34.19	32.88	31.29	195.22	8.34	5.30
13					2.57	16.53	29.89	33.25	49.60	61.84	9.09	5.17
14					3.52	32.13	30.36	24.29	30.26	42.97	8.08	5.24
15					2.87	58.57	26.62	15.79	35.77	62.02	10.84	5.06
16					8.68	84.91	23.91	12.89	45.96	29.42	7.96	5.28
17					9.53	55.20	14.01	14.38	23.54	22.98	7.50	8.16
18					4.81	27.84	12.52	11.96	19.15	22.32	7.38	5.17
19					3.72	67.91	8.15	15.32	36.52	31.76	7.06	4.48
20					3.20	22.51	31.48	10.27	18.49	27.09	6.87	4.30
21					2.94	175.60	33.63	9.19	129.84	19.80	6.74	4.27
22					2.93	85.09	20.83	8.07	41.01	23.54	6.93	4.06
23					2.86	75.66	14.01	7.00	53.62	19.24	6.47	3.99
24					2.93	20.55	27.65	9.27	127.97	22.70	6.31	3.92
25					6.75	20.55	30.54	28.58	36.05	16.53	6.23	3.74
26					37.74	13.73	49.13	67.53	33.63	16.53	6.10	3.78
27					79.40	10.27	69.68	24.38	48.01	19.15	5.92	3.69
28					62.49	8.74	45.40	47.36	59.50	16.25	5.93	3.56
29					39.32	10.46	43.53	33.07	136.37	14.66	5.85	3.67
30					41.38	15.32	109.29	22.70	176.54	23.26	5.45	3.67
31					10.09		90.79	26.25		35.59		3.56
Total					359.98	1009.48	832.26	1052.31	1845.99	1613.32	278.87	147.28
Average					11.61	33.65	26.85	33.95	61.53	52.04	9.30	4.75

Table 10.13 DAILY DISCHARGE AT SAN ESTEBAN DAMSITE (1971)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	3.54	2.19	2.23	1.91	2.00	6.07	5.47	82.68	150.49	88.39	15.32	4.89
2	3.74	2.30	2.19	2.28	2.01	8.24	4.41	13.60	58.66	24.30	14.05	5.62
3	3.70	2.21	2.09	2.30	2.02	6.14	2.66	13.51	116.95	22.48	13.05	5.67
4	3.70	2.09	2.23	3.54	1.58	11.79	2.55	21.49	46.51	119.67	12.42	5.74
5	3.45	2.06	2.14	3.11	1.98	38.17	2.58	8.71	29.65	34.45	12.06	4.43
6	3.48	2.09	2.07	2.94	1.79	21.67	2.67	7.02	26.20	105.16	13.51	4.37
7	3.35	2.19	2.16	2.63	1.79	7.28	3.22	7.08	29.28	89.48	10.52	4.21
8	3.35	2.12	2.07	1.80	1.79	32.82	2.75	11.24	41.16	38.71	9.70	4.21
9	3.28	2.18	1.99	1.47	1.86	19.49	2.99	15.96	44.79	48.41	9.43	4.21
10	3.17	2.18	1.90	1.40	1.90	7.16	2.87	6.76	42.43	23.75	8.87	4.01
11	3.28	2.03	1.91	1.32	1.91	21.85	2.82	6.03	53.76	26.47	8.14	3.74
12	3.27	2.10	1.89	1.21	1.88	145.05	5.29	6.61	31.37	56.30	7.94	3.65
13	3.02	2.39	1.95	1.22	2.20	42.97	4.32	93.38	22.12	49.59	7.68	3.44
14	3.06	2.19	1.96	1.50	2.97	19.67	4.92	9.88	18.31	92.47	7.34	4.12
15	3.07	2.38	1.95	2.08	2.38	12.87	6.26	7.60	15.68	56.66	7.04	3.86
16	3.15	2.45	1.89	2.09	5.72	15.23	5.61	34.63	11.88	76.24	6.87	3.04
17	3.06	2.54	1.99	2.13	6.16	15.77	26.65	109.70	10.52	69.54	6.80	3.07
18	3.14	2.54	1.95	2.18	66.82	7.84	14.14	46.69	9.25	60.02	6.87	3.78
19	3.14	2.38	1.92	2.15	8.04	6.55	6.59	56.84	11.88	53.40	6.84	2.93
20	3.02	2.30	1.94	2.12	4.92	9.25	5.15	50.95	11.06	45.87	6.65	2.93
21	2.98	2.39	1.48	2.21	3.74	6.02	4.41	53.31	61.56	108.79	7.08	3.65
22	2.77	2.56	1.96	1.99	3.75	5.15	3.54	64.37	21.40	56.39	9.70	3.59
23	2.83	2.47	1.91	1.80	3.77	4.56	3.29	59.56	17.04	51.40	7.60	3.65
24	2.96	2.34	1.88	1.80	6.67	4.38	3.67	40.71	58.57	57.39	7.26	3.75
25	2.92	2.41	1.84	1.83	5.72	4.36	8.59	56.93	44.97	36.35	6.23	3.65
26	2.73	2.38	1.87	1.78	4.12	3.97	14.87	53.94	41.88	25.11	5.93	3.65
27	2.63	2.27	1.80	1.80	4.05	3.69	7.77	96.10	30.91	24.21	5.78	3.65
28	2.59	2.34	1.87	1.87	4.22	4.61	8.20	95.19	37.26	21.40	5.75	3.57
29	2.45	0.00	1.87	1.87	10.88	7.36	14.14	78.51	22.94	35.27	5.38	3.39
30	2.48	0.00	1.94	1.96	8.40	6.93	5.70	120.58	64.10	24.84	5.20	3.43
31	2.56	0.00	1.84	0.00	6.36	0.00	28.01	96.10	0.00	17.13	0.00	3.39
TOTAL	95.86	64.07	60.65	60.46	183.42	506.93	216.11	1,425.65	1,182.56	1,639.66	257.02	121.29
AVERAGE	3.09	2.29	1.96	2.02	5.92	16.90	6.97	45.99	39.42	52.89	8.57	3.91
TOTAL (MCM)												502.30
AVERAGE (m3)												15.93

UNIT: m³/s

Table 10.14 DAILY DISCHARGE AT SAN ESTEBA DAM SITE(1972)

UNIT: m³/s

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	3.32	2.39	2.05	1.40	2.34	6.83	4.15	4.24	5.73	60.56	6.75	3.23
2	3.28	2.46	2.02	1.30	2.31	7.12	3.69	3.97	9.34	57.12	11.70	3.15
3	3.32	2.57	2.13	1.14	2.20	5.31	3.41	3.54	9.52	24.93	6.84	3.12
4	3.25	2.48	1.58	1.07	3.23	4.46	3.31	3.21	10.52	26.11	8.29	2.92
5	3.12	1.80	1.41	0.90	4.14	10.88	3.15	2.96	8.46	50.59	7.06	2.88
6	3.10	2.39	1.43	0.81	5.44	23.93	3.19	2.81	11.88	85.13	6.12	2.90
7	3.06	2.44	1.36	1.19	3.08	30.82	2.85	2.68	21.58	44.97	5.53	2.88
8	3.20	2.47	1.42	1.50	5.06	28.74	3.03	2.68	10.06	97.91	11.24	2.75
9	2.57	2.50	1.32	1.50	5.67	18.13	2.67	2.79	7.06	32.00	5.76	2.66
10	3.18	1.88	1.17	1.11	7.21	65.82	2.49	3.45	5.81	24.12	5.22	2.62
11	2.60	1.93	1.07	1.03	14.60	14.87	2.53	5.39	5.19	16.86	5.17	2.66
12	3.21	2.33	1.00	1.19	5.78	22.66	2.49	3.93	4.61	15.50	5.82	2.53
13	3.08	1.75	1.35	1.67	4.59	17.59	2.38	3.73	4.84	17.77	7.34	2.60
14	2.43	2.21	1.43	1.78	9.25	10.06	2.34	6.81	4.32	17.41	9.34	2.58
15	2.28	2.12	1.46	1.75	5.40	7.57	2.28	4.61	3.71	12.24	6.09	2.32
16	2.15	2.39	1.43	1.81	9.16	7.65	2.28	3.63	3.42	11.88	6.95	2.32
17	1.94	2.35	1.49	6.99	16.32	7.34	2.28	3.32	8.53	11.60	6.93	2.24
18	2.25	1.47	1.43	11.42	7.44	6.15	1.93	3.32	5.01	12.24	5.60	2.24
19	2.16	1.17	1.76	4.32	5.30	5.46	3.39	3.70	25.02	43.43	5.02	2.24
20	2.25	1.21	1.53	3.63	18.77	5.00	6.57	3.12	13.15	70.26	4.52	2.22
21	2.90	1.24	1.40	3.07	16.32	39.35	9.52	3.01	8.59	24.48	4.20	2.34
22	2.85	1.21	1.37	2.16	6.96	57.75	13.51	3.01	7.61	12.42	4.13	2.48
23	2.88	1.25	1.44	3.04	5.36	15.32	8.92	3.14	9.16	10.06	4.04	2.53
24	2.77	1.60	1.40	3.13	4.52	10.61	6.31	6.16	26.11	8.83	4.13	2.55
25	2.72	1.60	1.42	2.70	4.18	10.79	7.35	4.27	63.28	8.61	3.95	2.57
26	2.64	1.49	1.40	2.53	6.83	7.80	11.97	8.39	40.43	8.20	3.89	2.47
27	2.62	1.54	1.35	2.53	10.24	6.65	24.12	24.30	44.79	7.71	3.74	2.31
28	2.66	1.60	1.47	2.42	10.88	5.71	12.51	18.49	41.52	7.13	3.52	2.36
29	2.53		1.42	2.62	53.04	5.04	7.34	36.54	29.01	12.51	3.44	2.36
30	2.50		1.47	2.57	10.15	4.46	5.80	9.97	30.91	7.42	3.19	2.51
31	2.50		1.49		7.55		4.99	7.32		6.67		2.66
TOTAL	85.31	53.83	45.47	74.26	273.32	469.86	172.79	198.47	479.17	846.67	175.53	80.18
VERAG	2.75	1.92	1.47	2.48	8.82	15.66	5.57	6.40	15.97	27.31	5.85	2.59
											TOTAL(MCM)	255.30
											AVERAGE(m ³)	8.10

Table 10.15 DAILY DISCHARGE AT ASN ESTEBAN DAM SITE(1975)

UNIT: m³/s

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	2.66	1.68	1.84	2.16	2.96	5.48	12.87	17.13	58.57	50.41	20.94	6.26
2	2.66	1.66	1.66	2.09	2.66	4.43	27.83	19.40	55.57	34.36	20.04	6.16
3	2.66	1.77	1.53	1.72	2.54	3.93	20.49	18.68	43.52	28.20	19.04	6.21
4	2.46	1.66	1.45	1.81	2.41	22.76	10.70	17.23	90.12	26.29	17.23	6.04
5	2.41	1.64	1.41	1.91	1.95	59.29	8.78	11.79	60.65	42.25	16.50	5.91
6	2.44	1.87	1.39	1.64	1.78	31.91	8.16	19.49	33.54	101.54	15.68	6.01
7	2.29	1.64	1.31	1.76	1.70	7.76	7.62	34.54	26.47	62.65	14.41	5.98
8	2.21	1.62	1.32	1.74	1.89	5.69	7.01	12.33	20.22	173.16	13.42	6.04
9	1.97	1.51	1.39	1.81	1.85	41.16	6.62	10.24	17.95	91.57	12.78	5.84
10	1.95	1.51	1.39	1.65	2.06	69.63	6.04	38.62	15.59	110.60	12.51	5.58
11	1.74	1.51	1.41	1.79	2.68	40.07	5.71	45.96	31.91	71.26	12.42	5.31
12	1.88	1.36	1.40	1.72	2.28	74.98	7.78	28.83	24.75	124.20	11.88	5.39
13	1.75	1.40	1.26	1.70	2.33	65.37	11.79	15.96	38.62	111.51	10.79	5.29
14	1.78	1.39	1.23	1.47	2.23	87.76	6.90	12.42	30.55	85.76	10.52	5.27
15	1.96	1.48	1.49	1.28	2.22	91.57	6.23	13.69	63.55	47.96	10.06	5.41
16	1.81	1.48	1.48	1.58	2.47	75.43	7.87	16.32	220.30	34.27	9.88	5.39
17	1.89	1.41	1.60	1.57	2.38	216.68	5.96	11.97	124.20	47.05	9.70	5.13
18	1.81	1.48	1.56	1.59	5.08	81.23	5.57	10.97	123.30	158.65	9.07	4.97
19	1.75	1.48	1.36	1.82	9.97	147.77	8.57	10.97	113.32	73.34	8.91	4.93
20	1.81	1.42	1.38	1.83	7.25	51.04	32.91	14.41	118.76	47.51	8.65	4.97
21	1.81	1.41	1.88	2.08	18.68	155.93	26.84	14.69	162.28	80.14	8.49	4.95
22	1.81	1.45	1.86	2.45	9.61	46.15	29.74	11.24	63.91	127.83	10.70	4.67
23	1.79	1.45	1.84	4.30	12.96	13.51	48.50	21.58	49.41	126.92	9.52	4.76
24	1.81	1.50	1.90	4.86	12.87	10.06	51.40	31.91	32.46	187.66	8.40	4.93
25	1.67	1.57	1.99	3.60	7.23	9.88	18.13	50.95	66.54	116.95	7.78	4.90
26	1.66	1.63	1.96	3.08	6.01	46.60	43.24	33.91	34.45	98.82	7.61	4.71
27	1.73	1.72	1.94	2.84	4.94	45.06	69.08	54.21	61.56	67.09	7.32	4.49
28	1.78	1.77	1.84	11.42	21.49	51.49	15.59	73.43	100.63	46.96	7.11	4.26
29	1.73		1.78	6.59	25.66	26.11	34.54	62.19	79.15	47.41	6.84	4.22
30	1.67		1.95	3.78	11.60	14.41	57.84	102.45	64.37	31.28	6.54	4.22
31	1.74		2.18		7.82		17.41	153.21		23.03		4.22
TOTAL	61.09	43.48	49.97	79.64	199.54	1603.14	627.71	990.73	2026.24	2476.63	344.70	162.40
VERAG	1.97	1.55	1.61	2.65	6.44	53.44	20.25	31.96	67.54	79.89	11.49	5.24
TOTAL(MCM) 748.68												
AVERAGE(m ³ /s) 23.74												

Table 10.16 DAILY DISCHARGE AT SAN ESTEBAN DAM SITE(1974)

UNIT: m³/s

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	4.03	2.49	1.57	2.16	1.31	2.21	22.57	4.86	28.56	23.48	5.11	2.25
2	4.07	2.45	1.47	2.14	1.31	13.87	22.21	3.74	18.49	55.76	4.89	2.33
3	3.99	2.53	1.50	1.99	1.59	19.40	23.75	3.28	16.59	181.32	4.49	2.17
4	4.03	2.61	1.45	1.99	1.54	12.33	10.52	3.26	9.52	80.32	4.47	2.21
5	3.99	2.60	1.37	2.07	1.57	5.06	7.30	4.74	23.03	43.61	4.26	2.16
6	3.67	2.38	1.34	2.02	1.74	3.83	6.00	3.53	15.96	29.65	4.20	2.24
7	3.67	2.03	1.54	1.95	2.04	3.15	5.23	2.96	16.50	22.85	4.24	2.24
8	3.69	2.02	1.70	1.81	2.17	2.87	4.72	2.96	55.03	19.22	4.33	2.18
9	3.74	2.00	1.83	1.82	2.30	2.54	4.39	2.71	21.94	19.76	4.26	2.06
10	3.60	2.00	1.75	1.87	2.08	2.54	4.55	2.48	29.19	15.32	4.26	2.06
11	3.62	2.05	1.90	1.89	1.97	3.06	7.03	2.69	19.67	12.15	4.20	2.11
12	3.75	1.93	1.73	1.90	1.89	6.45	6.22	4.08	17.32	15.32	4.26	2.38
13	3.65	1.87	1.74	1.98	1.92	26.02	7.31	3.43	19.13	41.79	3.98	2.39
14	3.43	1.89	1.69	1.94	1.87	12.42	11.15	4.78	21.03	23.66	3.91	2.27
15	3.25	1.80	1.87	1.90	2.56	4.55	5.25	8.53	11.97	39.16	3.62	2.29
16	3.14	1.76	2.34	1.76	6.49	3.96	4.05	3.86	10.52	19.58	3.57	2.25
17	3.15	1.91	2.49	1.76	7.31	6.36	6.63	3.10	10.34	22.03	3.55	2.13
18	3.13	1.89	2.21	1.80	2.67	4.94	4.85	2.60	10.06	13.42	3.35	2.04
19	3.25	1.79	1.92	1.81	11.42	4.60	4.39	2.57	93.38	11.51	3.24	1.98
20	3.21	1.85	1.70	1.75	3.56	10.61	5.94	2.48	393.46	10.52	3.08	1.89
21	3.41	1.85	1.68	1.81	15.05	22.57	4.29	2.28	150.49	10.24	3.00	1.83
22	3.15	1.83	1.74	1.89	18.22	16.14	3.89	2.41	46.69	9.34	2.92	1.80
23	3.14	1.81	1.67	1.95	4.69	17.41	4.56	2.47	49.86	8.64	2.83	1.83
24	3.12	1.76	1.70	1.99	4.36	8.24	4.09	6.66	28.29	8.36	2.80	1.55
25	2.84	1.70	1.61	2.09	3.26	20.76	3.67	20.85	20.13	8.05	2.67	1.67
26	2.85	1.47	1.66	2.05	2.73	17.95	3.28	18.04	26.56	7.49	2.54	1.80
27	2.78	1.61	1.46	1.99	3.16	10.79	3.08	11.33	21.03	7.46	2.38	1.69
28	2.88	1.57	1.40	2.12	2.63	8.90	2.83	17.59	15.50	7.24	2.33	1.57
29	2.52		1.31	2.10	2.36	7.06	2.74	25.29	21.40	6.09	2.33	1.47
30	2.67		2.29	2.21	2.91	33.09	2.67	16.23	32.37	5.91	2.30	1.44
31	2.52		2.14		2.38		9.52	11.15		5.61		1.57
TOTAL	103.94	55.47	53.78	58.52	121.06	313.69	218.67	206.94	1254.00	784.87	107.38	61.86
VERAG	3.35	1.98	1.73	1.95	3.91	10.46	7.05	6.68	41.80	25.32	3.58	2.00

TOTAL(MCM) 288.59
 AVERAGE(m³/s) 9.15

Table 10.17 DAILY DISCHARGE AT SAN ESTEBAN DAM SITE(1975)

UNIT: m³/s

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1.59	1.28	1.31	1.01	2.29	12.91	2.10	30.69	36.20	132.14	25.29	5.94
2	1.60	1.37	1.44	1.00	2.39	24.73	1.91	12.61	53.19	68.46	78.97	5.49
3	1.58	1.43	1.44	0.89	3.19	12.35	2.02	10.34	40.84	48.65	58.16	5.34
4	1.50	1.37	1.40	0.97	2.97	19.09	2.43	38.73	40.48	41.29	31.67	5.08
5	1.53	1.29	1.40	0.89	2.96	7.92	2.50	50.26	90.56	39.30	24.00	4.85
6	1.53	1.32	1.35	0.92	2.97	6.11	3.23	11.99	107.36	57.82	23.46	4.64
7	1.39	1.29	1.26	1.07	2.95	7.70	18.97	9.50	35.91	68.55	42.93	4.44
8	1.36	1.24	1.42	1.06	2.79	7.40	22.71	30.87	67.81	36.89	34.19	4.40
9	1.43	1.25	1.43	1.08	2.92	5.88	6.20	23.34	59.11	55.46	35.97	4.30
10	1.84	1.20	1.38	1.12	2.80	4.98	4.31	14.17	116.13	31.31	35.31	4.03
11	1.80	1.31	1.42	1.18	2.65	4.20	3.58	10.27	185.29	27.11	38.23	3.86
12	1.83	1.27	1.38	1.22	2.59	4.55	3.14	31.07	56.20	22.78	29.17	3.74
13	1.88	1.32	1.46	1.31	2.53	4.13	2.72	10.55	30.48	31.57	25.43	3.60
14	1.70	1.26	1.35	1.38	2.63	3.41	2.42	7.83	30.87	72.39	17.57	3.48
15	1.71	1.34	1.40	0.97	2.49	3.29	2.22	6.45	41.77	28.30	14.59	3.54
16	1.70	1.39	1.27	1.13	3.53	3.29	2.17	29.24	20.78	24.98	13.38	3.11
17	1.66	1.39	1.31	1.18	2.43	3.12	8.68	57.68	40.63	22.52	12.47	3.09
18	1.60	1.44	1.20	0.94	4.06	2.98	4.62	77.82	26.49	45.42	11.84	3.04
19	1.66	1.37	0.98	1.36	2.81	3.07	2.97	73.81	25.90	69.59	11.05	3.07
20	1.68	1.31	1.08	1.50	2.48	4.00	2.57	65.90	25.93	42.48	10.62	2.79
21	1.59	1.40	1.02	1.51	2.25	8.45	5.58	24.19	40.28	23.19	10.62	2.90
22	1.45	1.35	1.09	1.48	6.43	6.27	19.33	12.46	36.09	21.81	11.69	2.82
23	1.37	1.35	0.92	1.41	4.16	13.80	84.00	27.28	97.72	17.52	8.35	2.93
24	1.48	1.33	0.86	1.43	3.68	5.73	25.29	25.37	330.91	15.35	8.13	2.67
25	1.43	1.19	0.66	1.50	4.88	4.18	39.35	16.58	59.69	14.62	7.64	2.68
26	1.44	1.17	0.92	1.53	8.34	3.27	41.68	10.18	39.07	28.98	6.99	2.78
27	1.40	1.32	0.95	1.45	19.62	2.52	9.80	9.30	33.51	39.72	6.65	2.58
28	1.36	1.28	1.06	1.72	21.36	2.43	13.89	24.80	29.40	26.54	6.70	2.78
29	1.28		0.97	2.17	36.24	3.75	6.45	18.08	33.13	17.53	6.48	2.59
30	1.40		1.02	2.30	39.46	2.49	4.93	25.91	65.68	21.78	6.20	2.67
31	1.41		1.06		24.89		4.13	41.22		19.79		2.41
TOTAL	48.19	36.83	37.21	38.68	227.74	197.98	355.90	838.51	1897.41	1213.84	653.77	111.62
AVERAG	1.55	1.32	1.20	1.29	7.35	6.60	11.48	27.05	63.25	39.16	21.79	3.60

TOTAL(MCM): 488.82
 AVERAGE(m³/s): 15.50

Table 10.18 DAILY DISCHARGE AT SAN ESTEBAN DAM SITE(1976)

UNIT: m³/s

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	2.38	3.57	2.07	1.88	7.52	2.70	16.71	3.27	4.75	13.51	4.95	2.35
2	2.51	3.74	1.84	1.63	24.43	30.35	14.93	3.27	4.63	12.68	4.73	2.28
3	2.19	3.26	1.68	1.70	8.14	18.56	16.65	3.47	6.52	20.32	4.49	1.97
4	1.93	3.48	1.63	1.91	6.03	69.32	12.83	3.92	21.48	15.97	4.18	1.99
5	2.83	3.55	1.71	2.09	4.29	240.85	22.07	3.54	19.89	12.28	3.84	2.35
6	3.62	3.07	1.83	2.02	2.96	119.22	31.08	3.08	8.75	17.29	3.82	2.28
7	3.91	3.09	1.95	2.19	2.27	44.76	37.12	2.88	7.69	23.70	3.60	2.24
8	4.47	2.66	1.98	2.31	1.77	23.38	16.67	2.52	5.45	32.81	3.39	1.89
9	4.30	2.63	1.75	2.57	1.29	22.64	25.01	2.22	4.75	17.39	3.39	1.83
10	4.13	2.87	1.80	7.27	0.97	29.05	13.86	1.96	5.58	15.59	3.09	1.77
11	4.49	2.93	1.76	3.04	0.75	40.64	11.64	2.15	9.64	14.43	3.08	1.81
12	4.57	2.33	1.78	2.11	0.64	43.52	10.48	2.45	7.26	14.04	2.89	1.72
13	4.24	2.05	1.68	2.23	0.55	46.24	9.46	5.18	7.00	12.77	3.12	1.86
14	4.44	2.05	1.74	2.13	0.59	49.43	26.95	10.60	5.17	12.46	3.25	1.56
15	4.36	2.09	1.81	2.29	0.87	39.67	20.12	4.43	9.89	11.98	3.16	1.59
16	4.17	1.97	1.57	2.61	1.53	33.28	8.43	3.87	5.00	34.14	3.31	1.77
17	4.17	1.73	1.61	2.71	2.04	25.28	7.93	3.99	14.62	58.75	3.96	2.03
18	4.81	1.83	1.51	4.26	8.65	45.57	7.78	6.03	6.19	24.01	4.36	1.73
19	4.85	1.75	1.35	3.69	6.25	36.93	7.33	4.33	4.71	13.85	3.86	1.79
20	4.77	1.63	1.58	6.60	4.98	25.44	6.92	4.55	4.19	23.30	3.62	1.76
21	4.65	1.64	1.43	3.92	3.75	40.61	6.25	9.15	5.02	16.38	3.42	1.81
22	4.86	1.87	1.60	3.93	3.25	92.47	5.73	4.73	7.45	10.12	3.28	1.77
23	4.73	1.87	1.50	3.58	3.13	78.71	5.06	4.84	35.91	9.98	2.93	1.79
24	4.43	1.82	1.47	2.95	3.13	75.69	4.73	7.82	30.06	9.07	2.74	1.73
25	4.50	1.74	1.48	2.61	3.16	88.46	4.61	15.45	16.41	8.05	2.62	1.79
26	4.33	1.82	1.79	4.39	12.12	30.46	4.45	16.85	68.05	7.57	2.77	1.79
27	4.23	1.79	1.79	3.25	10.89	57.29	4.11	6.01	41.56	7.01	2.57	1.67
28	4.13	1.91	1.89	5.65	6.81	30.64	3.68	6.19	18.54	6.72	2.33	1.81
29	3.74		2.06	12.86	4.46	21.64	3.48	14.72	19.88	6.12	2.35	1.69
30	3.94		1.65	30.43	3.39	20.20	3.63	10.74	16.88	5.55	2.28	1.61
31	3.60		1.79		3.05		3.32	5.80		5.24		1.63
TOTAL	124.24	66.71	53.07	130.79	143.65	1523.00	373.00	180.00	422.91	493.08	101.38	57.67
VERAG	4.01	2.38	1.71	4.36	4.63	50.77	12.03	5.81	14.10	15.91	3.38	1.86

TOTAL(MCM): 317.05
 AVERAGE(m³/s): 10.05

Table 10.19 DAILY DISCHARGE AT SAN ESTEBAN DAM SITE(1977)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1.47	1.31	1.17	1.04	4.41	60.10	3.79	6.45	8.69	12.36	8.66	2.25
2	1.47	1.30	1.17	1.04	3.23	15.47	3.43	9.64	13.78	12.57	4.76	2.40
3	1.46	1.30	1.16	1.03	7.58	17.91	3.23	4.24	6.39	11.06	13.75	2.79
4	1.46	1.29	1.16	1.03	9.65	46.86	3.07	3.23	11.74	13.84	15.13	2.82
5	1.45	1.29	1.16	1.02	9.44	69.44	2.93	2.70	4.98	6.80	10.60	2.65
6	1.45	1.28	1.15	1.02	4.11	53.28	2.77	2.98	3.91	5.42	7.22	2.49
7	1.44	1.28	1.15	1.02	3.84	29.78	2.62	20.58	3.47	5.37	5.67	2.48
8	1.44	1.27	1.14	1.01	2.49	45.02	2.47	12.49	3.28	4.20	4.71	2.41
9	1.43	1.27	1.14	1.01	2.26	32.99	2.33	5.02	3.15	10.27	4.10	2.27
10	1.42	1.26	1.13	1.01	4.78	17.94	2.17	3.79	2.90	6.89	3.67	2.26
11	1.42	1.26	1.13	1.00	4.58	16.15	2.06	8.96	2.64	5.95	3.44	2.26
12	1.41	1.25	1.13	1.00	3.20	9.37	2.06	14.48	2.47	5.59	3.26	2.21
13	1.41	1.25	1.12	0.99	3.03	6.22	2.03	5.78	2.88	5.73	2.97	2.14
14	1.40	1.24	1.12	0.99	4.22	6.95	2.04	4.18	10.03	7.60	2.91	2.16
15	1.40	1.24	1.11	0.99	4.72	21.92	2.13	3.76	21.31	3.56	2.75	2.07
16	1.39	1.23	1.11	0.98	4.48	75.93	2.10	3.83	29.89	3.04	2.65	2.15
17	1.39	1.23	1.10	0.98	6.42	9.72	2.22	8.10	20.60	2.86	2.61	2.08
18	1.38	1.23	1.10	0.98	3.64	8.12	2.38	14.13	10.71	2.77	2.76	2.10
19	1.38	1.22	1.09	0.97	2.66	8.74	2.21	4.82	6.79	2.63	4.91	3.10
20	1.37	1.22	1.09	0.97	2.73	7.50	2.03	3.66	5.36	2.82	6.02	2.30
21	1.36	1.21	1.09	0.96	2.25	9.71	1.93	7.43	5.09	2.67	3.65	2.26
22	1.36	1.21	1.08	0.96	2.60	10.36	1.93	12.89	10.56	2.82	3.29	2.24
23	1.35	1.20	1.08	0.96	5.08	5.58	1.95	19.31	5.27	6.76	3.04	2.14
24	1.35	1.20	1.07	0.95	2.81	5.15	1.99	18.63	33.27	5.95	2.86	2.16
25	1.34	1.19	1.07	0.95	1.98	4.84	2.24	13.85	46.07	6.23	2.77	2.10
26	1.34	1.19	1.07	0.95	1.91	4.65	2.06	8.08	16.59	5.08	2.53	2.17
27	1.33	1.18	1.06	0.94	2.30	6.06	2.00	10.59	14.09	5.64	2.31	2.10
28	1.33	1.18	1.06	0.94	1.99	5.15	1.86	18.72	22.37	4.59	2.36	2.05
29	1.32		1.05	0.94	6.41	5.12	1.80	6.69	13.62	17.75	2.14	2.00
30	1.32		1.05	0.93	3.44	5.88	1.80	5.50	11.89	7.72	2.12	2.04
31	1.31		1.05		32.60		2.54	6.42		5.01		2.00
TOTAL	43.17	34.78	34.37	29.56	154.83	621.94	72.17	270.95	353.78	201.56	139.63	70.64
VERAG	1.39	1.24	1.11	0.99	4.99	20.06	2.33	8.74	11.79	6.50	4.65	2.28
TOTAL(MCM); 175.17												
AVERAGE(m3/s); 5.55												

Table 10.20 DAILY DISCHARGE AT SAN ESTEBAN DAM SITE(1978)

UNIT: m³/s

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1.27	1.17	1.08	0.98	1.66	10.29	16.33	7.69	65.76	37.95	5.91	2.46
2	1.27	1.16	1.07	0.98	1.55	8.36	18.22	5.36	53.57	66.14	8.84	2.57
3	1.27	1.16	1.07	0.98	1.42	10.63	25.40	4.42	33.85	58.26	10.39	2.46
4	1.26	1.16	1.07	0.97	1.16	18.52	6.49	9.15	52.33	81.46	6.31	2.60
5	1.26	1.15	1.06	0.97	2.67	13.96	39.31	20.20	49.04	28.49	6.05	2.42
6	1.26	1.15	1.06	0.97	2.39	7.80	8.32	5.20	111.69	47.51	5.90	2.34
7	1.25	1.15	1.06	0.97	1.91	20.86	8.36	16.42	138.98	42.47	5.60	2.47
8	1.25	1.14	1.05	0.96	3.29	8.53	5.97	23.93	50.11	21.08	6.19	2.73
9	1.25	1.14	1.05	0.96	1.86	9.80	5.62	14.06	34.89	20.58	12.79	2.98
10	1.24	1.14	1.05	0.96	1.53	4.27	4.18	5.60	22.08	15.13	7.06	3.96
11	1.24	1.13	1.04	0.96	1.53	3.63	4.34	3.90	18.43	18.90	7.91	3.53
12	1.23	1.13	1.04	0.95	1.36	3.32	13.34	3.97	19.76	36.70	5.58	2.95
13	1.23	1.13	1.04	0.95	1.30	2.44	84.35	6.04	26.77	15.08	4.66	2.78
14	1.23	1.12	1.04	0.95	1.20	2.70	30.66	3.54	42.89	100.25	4.22	2.63
15	1.22	1.12	1.03	0.94	1.22	5.07	14.90	2.66	15.45	74.88	4.49	2.51
16	1.22	1.12	1.03	0.94	1.20	2.75	18.40	2.34	12.44	96.25	4.43	2.33
17	1.22	1.11	1.03	0.94	1.11	1.72	50.38	2.16	14.59	125.73	3.89	2.31
18	1.21	1.11	1.02	0.94	1.14	1.40	16.85	25.14	15.68	53.63	3.33	2.27
19	1.21	1.11	1.02	0.93	2.39	1.53	18.47	18.15	91.67	33.33	3.11	2.20
20	1.21	1.10	1.02	0.93	45.94	7.34	10.81	6.09	107.32	25.85	3.22	2.15
21	1.20	1.10	1.02	1.28	7.62	7.06	44.69	16.21	154.20	20.70	3.34	2.22
22	1.20	1.10	1.01	1.17	4.76	9.79	30.73	8.84	49.13	17.84	3.39	2.16
23	1.20	1.09	1.01	1.33	3.52	4.76	24.36	12.34	80.68	15.75	3.29	2.23
24	1.19	1.09	1.01	1.18	3.61	3.23	11.07	35.74	106.85	16.10	3.41	2.19
25	1.19	1.09	1.00	2.38	3.05	2.35	7.68	29.19	99.55	12.58	3.33	2.19
26	1.19	1.08	1.00	4.85	5.51	1.88	5.50	13.73	68.72	12.03	3.03	2.21
27	1.18	1.08	1.00	5.90	7.79	4.25	5.61	18.28	92.76	13.34	3.10	2.11
28	1.18	1.08	0.99	2.88	9.60	2.23	23.66	35.82	74.94	15.04	2.76	2.30
29	1.18		0.99	1.99	12.36	1.76	7.80	39.40	119.06	10.02	2.71	2.41
30	1.17		0.99	1.62	5.80	6.18	8.55	108.50	71.58	8.35	2.67	2.23
31	1.17		0.99		6.79		25.08	114.10		7.68		2.23
TOTAL	37.85	31.40	31.94	43.73	148.24	188.47	595.40	618.18	1894.77	1149.10	150.90	77.14
VERAG	1.22	1.01	1.03	1.41	4.78	6.08	19.21	19.94	61.12	37.07	4.87	2.49

TOTAL(MCM): 429.16
 AVERAGE(m³/s): 13.61

Table 10.21 DAILY DISCHARGE AT SAN ESTEBAN DAM SITE(1979)

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1.97	1.38	1.26	1.15	3.46	23.49	27.27	9.09	46.86	14.95	14.53	4.83
2	1.99	1.34	1.06	1.09	2.60	13.96	42.39	47.75	10.39	27.52	28.91	4.81
3	1.87	1.35	1.09	1.09	2.69	9.83	47.34	23.31	82.46	36.29	56.06	4.87
4	1.69	1.33	1.18	1.04	9.86	90.27	82.56	51.55	54.89	33.41	21.65	4.74
5	1.64	1.31	1.21	1.06	4.91	50.05	27.63	15.44	35.26	21.20	16.81	4.40
6	1.58	1.25	1.21	0.99	4.56	18.21	79.49	10.04	35.81	19.66	14.82	4.30
7	1.61	1.25	1.16	1.13	4.44	11.40	27.64	8.39	57.82	16.31	13.54	4.28
8	1.66	1.22	1.12	1.23	3.55	33.05	17.54	7.42	40.36	81.46	12.48	4.21
9	1.55	1.18	1.16	1.21	3.14	16.95	16.79	6.93	31.50	72.16	11.60	4.12
10	1.45	1.17	1.09	1.21	2.88	15.57	14.10	6.29	59.78	58.08	10.93	4.31
11	1.44	1.30	1.14	1.12	2.75	10.89	49.97	5.25	44.50	50.22	10.30	4.13
12	1.38	1.33	1.16	1.09	3.37	9.76	34.03	4.80	106.95	47.03	9.60	4.04
13	1.39	1.29	1.09	1.09	2.98	9.22	18.79	4.41	90.70	32.60	9.35	3.79
14	1.38	1.25	1.11	1.14	11.67	57.27	18.04	5.13	61.91	31.21	8.65	3.62
15	1.33	1.29	1.09	1.16	4.80	42.03	11.09	4.53	37.49	36.70	7.75	3.60
16	1.34	1.34	1.09	1.16	3.59	43.30	9.41	5.08	30.89	53.80	7.26	3.50
17	1.22	1.37	1.06	1.12	2.98	13.69	8.24	9.89	53.78	38.47	7.06	3.43
18	1.18	1.34	0.98	1.09	2.50	9.00	9.70	11.79	48.16	65.04	6.64	3.36
19	1.24	1.37	0.98	1.18	2.26	7.22	17.48	22.60	31.21	52.97	6.44	3.30
20	1.08	1.28	0.98	3.28	2.15	6.84	8.62	43.94	24.19	65.94	6.26	3.15
21	1.24	1.27	0.98	4.36	2.14	5.89	8.06	62.11	29.44	69.79	6.10	3.25
22	1.18	1.25	0.98	2.41	2.02	9.21	20.35	53.23	21.74	39.79	5.97	3.38
23	1.13	1.35	0.98	5.39	1.83	6.23	11.50	20.69	17.13	46.86	5.56	3.53
24	1.28	1.35	1.06	11.29	1.66	17.78	8.37	19.41	15.19	37.17	5.19	3.49
25	1.48	1.41	1.09	4.18	3.19	7.25	7.06	20.86	15.47	23.99	5.09	3.41
26	1.51	1.30	1.09	4.73	1.99	4.77	28.44	12.64	57.34	19.11	5.01	3.29
27	1.47	1.24	1.09	3.06	3.34	4.06	38.14	10.55	44.74	18.60	4.96	3.19
28	1.55	1.31	1.10	8.20	5.44	3.52	11.57	10.48	25.50	15.87	4.96	3.12
29	1.54		1.29	29.65	3.42	16.46	21.81	16.31	29.31	19.06	5.05	3.09
30	1.47		1.30	5.18	8.55	19.46	12.11	36.70	29.71	24.79	4.89	3.12
31	1.43		1.19		4.85		8.52	114.64		21.67		3.06
TOTAL	45.26	36.42	34.36	103.07	119.47	596.62	744.07	681.25	1270.51	1191.71	333.40	116.74
VERAG	1.46	1.30	1.11	3.44	3.85	19.55	24.00	21.98	42.35	38.44	11.11	3.77

TOTAL(MCM): 454.71
 AVERAGE(m3/s): 14.42

Table 10.22 DAILY DISCHARGE AT SAN ESTEBAN DAM SITE(1980)

UNIT: m³/s

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	3.01	2.08	2.00	1.81	2.50	26.87	8.70	20.37	11.36	32.58	13.44	5.62
2	2.91	2.03	2.13	1.81	2.45	16.74	7.89	46.94	11.76	37.03	12.67	5.49
3	2.96	1.94	2.08	1.81	2.51	9.71	7.34	24.18	9.60	101.95	11.91	5.26
4	3.06	2.06	1.93	1.87	3.14	17.68	6.83	14.34	10.98	115.81	11.52	5.05
5	3.17	2.19	1.91	1.91	3.17	36.03	6.66	12.01	9.36	42.25	13.44	5.00
6	1.36	2.10	1.94	1.81	5.12	9.54	8.21	14.07	10.10	55.48	11.52	4.90
7	3.19	2.10	2.09	1.81	3.41	7.69	6.70	53.72	8.29	103.01	10.75	4.84
8	2.94	1.98	2.11	1.81	3.64	10.72	6.16	15.28	19.72	57.25	10.37	4.83
9	2.77	2.08	2.16	1.81	3.20	55.58	10.29	16.80	32.80	57.10	10.37	4.69
10	2.62	2.15	2.14	1.81	2.90	23.45	6.77	15.23	94.01	71.47	10.75	4.60
11	2.60	2.31	2.07	1.81	2.83	73.11	6.48	20.16	39.96	118.10	9.99	4.51
12	2.62	2.23	2.09	1.81	2.89	96.08	6.94	15.38	62.66	64.74	9.22	4.51
13	2.63	2.11	2.11	1.81	10.33	178.14	10.64	10.94	104.14	47.77	9.60	4.48
14	2.65	1.96	2.05	1.81	6.26	37.75	6.57	26.28	66.96	33.90	9.22	4.48
15	2.53	1.96	2.06	1.81	16.01	86.81	5.69	193.56	32.57	58.19	8.68	4.48
16	2.50	2.00	2.13	1.81	7.61	33.34	5.25	44.04	32.73	76.00	9.29	4.40
17	2.52	2.05	2.09	1.76	4.94	18.27	4.95	34.40	31.10	43.03	9.22	4.27
18	2.62	2.11	1.97	1.70	3.90	12.57	4.70	27.21	28.68	35.68	9.22	4.25
19	2.66	2.05	1.89	1.67	3.54	10.86	6.35	57.80	37.78	53.80	7.68	4.07
20	2.75	2.00	1.81	1.67	3.26	55.08	18.33	62.36	62.46	38.81	8.10	4.07
21	2.74	1.96	1.81	1.67	3.96	153.00	23.69	64.93	52.49	43.95	7.70	4.07
22	2.66	2.13	1.81	1.67	7.70	129.30	16.47	39.61	56.78	30.99	7.39	4.00
23	2.61	2.11	1.81	1.67	10.32	74.12	11.91	24.60	59.15	37.97	6.99	3.88
24	2.59	2.20	1.85	1.67	27.43	73.60	77.84	19.73	38.68	24.70	6.97	3.88
25	2.42	2.16	1.90	1.67	7.40	29.93	22.08	15.71	34.81	20.22	6.79	3.80
26	2.39	2.04	1.87	1.63	5.00	16.46	25.57	13.81	30.16	18.17	6.67	3.68
27	2.35	2.06	1.81	1.64	29.98	14.05	16.44	12.53	167.26	16.77	6.36	3.68
28	2.38	2.00	1.81	2.80	106.59	12.21	33.89	11.48	68.11	19.59	6.13	3.61
29	2.14		1.81	2.06	49.85	10.67	15.59	10.98	40.58	18.44	5.81	3.49
30	1.68		1.81	1.83	59.42	9.64	12.22	14.74	35.23	16.44	5.66	3.49
31	1.84		1.81		30.09		27.33	18.42		15.32		3.49
TOTAL	79.87	58.16	60.88	54.24	431.36	1339.00	434.46	971.60	1300.27	1506.54	273.43	134.90
VERAG	2.58	2.08	1.96	1.81	13.91	43.19	14.01	31.34	43.34	48.60	9.11	4.35

TOTAL(MCM): 574.1
 AVERAGE(m³/s): 18.20

Table 10.23 STABILITY ANALYSIS OF GRAVITY DAM(DAM HEIGHT 43M)

DAM CONFIGURATION

HEIGHT 43 m
 D/S SLOPE 0.8
 FILET HEIGHT 20 m
 SLOPE 0.5

WATER DEPTH 37

PROPERTY OF MATERIAL

UNIT WIGHT CONCRETE 2.3 t/m³
 SEDIMENT 1 t/m³

LOAD

SEISMIC COEFFICIENT 0.12

STRENGTH OF FOUNDATION ROCK

Phai 40 degree
 Tau 80 t/m²

CALCULATION OF SELF WEIGHT OF DAM

PART	AREA (m ²)	WEIGHT (t/m)
MAIN TRIANG	740	1,701
FILET	100	100
TOTAL	840	1,801

STABILITY ANALYSIS

LOAD	VERTICAL	HORIZONTAL
SELF WEIGHT	1,801	
WATER WEIG	270	
SEDIMENT W	150	
SEISMIC FORCE		216.1296
HYDROSTATIC F.		684.5
HYDRODYNAMIC F.		82.14
SEDIMENT FORCE		312.5
UPLIFT	-273.8	
TOTAL	1,947	1,295

SAFETY FACTOR

$$= (V * \tan(\text{phai}) + L * \tau) / H$$

$$= 4.00$$

Table 10.24 STABILITY ANALYSIS OF ROCK FILL DAM

PROPERTY OF MATERIALS			
ROCK MATERIAL	Wsat/Wsub=		1.90
	U/S	phai=	40.00 degree
	D/S	phai=	35.00 degree
SEISMIC COEFFICIENT			
HORIZONTAL	k=		0.15
SLOPE GRADIENT			
U/S	Tan(theta)=		0.3333
D/S	Tan(theta)=		0.40
SAFETY FACTOR UPSTREAM			
	$FS = \frac{(1 - k \cdot W_{sat}/W_{sub} \cdot \tan(\theta))}{(\tan(\theta) + k \cdot (W_{sat}/W_{sub})) \cdot \tan(\phi)}$		
	$= 1.23$		
SAFETY FACTOR DOWNSTREAM			
	$FS = \frac{(1 - k \cdot \tan(\theta))}{(\tan(\theta) + k) \cdot \tan(\phi)}$		
	$= 1.20$		

Table 10.25 COST OF SEPTEMBER 15 DAM

FEATURES OF DAM	UNIT	AMOUNT	UNIT COST
RESERVOIR AREA	km ²	35.75	
RESERVOIR VOLUME	m ³	380,000,000	
ROCK FILL VOLUME	m ³	2,848,000	
impervious fill	m ³	395,000	
unprocessed filter	m ³	557,000	
processed filter	m ³	125,700	
grizzled rock	m ³	123,700	
random rockfill	m ³	1,220,600	
oversized rockfill	m ³	76,600	
random fill	m ³	350,000	
CONCRETE VOLUME	m ³	333,700	
spillway concrete	m ³	170,000	
powerhouse concrete	m ³	144,000	
gravity wall concrete	m ³	15,000	
spillway bridge concrete	m ³	700	
miscellaneous concrete	m ³	4,000	
NUMBER OF RESETTLEMENT	person	2,000	

PROJECT COST	US \$(8.72C)	M.YEN(110Y=1D)	UNIT COST
LAND ACQUISITION	36,996,223	4,242,686	35.75
HOUSING AND DEVELOPMENT(POWER HOUSE ETC)	364,925,826	41,849,292	2,848,000
CIVIL WORKS	1,023,410,864	117,363,631	333,700
TURBIN,MOTERS,GENERATORS	178,841,978	20,509,401	170
ELECTRIC CONTROL UNIT	19,884,701	2,280,356	2194 (US\$/M2)
EQUIPMENT	29,386,894	3,370,057	
SUBSTATIONS	87,234,443	10,003,950	
TOTAL	1,740,680,929	199,619,373	

US\$	RELATED AMOUNT	unit
4,242,686	RESERVOIR AREA	km ²
159,212,923	ROCK FILL	m ³
36,163,763	CONCRETE	m ³
199,619,373	MAX CAPACITY	MW

Table 10.26 COST OF SAN ESTEBAN DAM (SPILLWAY COMBINED)

1. ROCK FILL DAM (WITH SPILLWAY)		COST (US\$)														
DAM HEIGHT	50	40	30	44.5	44	43.5	43	39	32	UNIT COST	44.5	44	43.5	43	39	32
ROCK VOLUME	3,138,660	1,650,488	705,530	2,323,454	2,249,345	2,175,235	2,191,126	1,561,374	895,717	30	69,703,633	67,480,344	65,257,654	63,033,765	46,841,216	20,871,518
FILTER VOLUME	327,378	207,316	117,155	201,344	235,341	249,338	243,335	195,310	135,187	30	7,840,328	7,680,235	7,480,143	7,300,050	5,659,309	4,655,614
CORE VOLUME	785,076	482,304	261,861	618,551	603,413	588,274	573,135	480,259	305,949	30	10,556,540	18,102,381	17,648,222	17,194,082	13,607,777	9,178,480
TOTAL VOLUME	4,251,115	2,346,088	1,084,545	3,203,350	3,108,099	3,012,847	2,917,596	2,216,943	1,336,854	30	96,100,501	93,242,960	90,385,419	87,527,877	66,508,302	40,105,611
2. DIVERSION TUNNEL INCLUDED IN SPILLWAY																
3. SPILLWAY																
DAM HEIGHT	50	40	30	44.5	44	43.5	43	39	32 <td>UNIT COST</td> <td>44.5</td> <td>44</td> <td>43.5</td> <td>43</td> <td>39</td> <td>32</td>	UNIT COST	44.5	44	43.5	43	39	32
DAM VOLUME	59,400	39,960	19,440	48,708	47,736	46,764	45,792	37,908	23,544	210	10,228,050	10,024,500	9,820,440	9,616,220	7,960,880	4,944,240
WALL VOLUME	184,583	85,867	37,350	121,289	117,353	113,418	109,482	81,015	47,053	210	25,470,725	24,644,200	23,817,675	22,991,150	17,013,150	9,881,200
ENERGY DISIPA	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	210	2,205,000	2,205,000	2,205,000	2,205,000	2,205,000	2,205,000
TOTAL VOLUME	234,483	136,327	67,290	180,487	175,589	170,682	165,774	129,423	81,057	210	37,904,465	36,873,700	35,843,115	34,812,470	27,176,830	17,030,440
4. LAND ACQUISITION																
DAM HEIGHT	m	120	125	130	135	140	122	129	133	133.5	134	134.5	134.5	134.5	134.5	134.5
AREA	km ²	17.16	23.81	30.99	38.31	45.38	19.82	29.554	35.382	36.189	36.88	37.2021429	37.2021429	37.2021429	37.2021429	37.2021429
PEOPLE	person	3,406	5,672	5,672	5,672	5,672	3,859	5,445	7,303	7,574	7,846	8,118	8,118	8,118	8,118	8,118
HOUSEHOLD	family	816	1,281	1,281	1,281	1,281	905	1,233	1,647	1,714	1,770	1,788	1,788	1,788	1,788	1,788
ROAD	km	1,716	2,381	3,099	3,831	4,538	3,073	4,386	5,360	5,360	5,360	5,360	5,360	5,360	5,360	5,360
CROP LAND	km ²	1,716	2,381	3,099	3,831	4,538	3,073	4,386	5,360	5,360	5,360	5,360	5,360	5,360	5,360	5,360
NUMBER OF DOT		135	215	215	215	215	135	215	215	215	215	215	215	215	215	215
NO. PERSON PER DOT		25	26	26	26	26	26	26	26	26	26	26	26	26	26	26
4. TOTAL COST																
PURPOSE	HEIGHT	DAM	SPILLWAY	GATE	SUB TOTAL-	COMPENSATI	SOLO TOT	MULTI RATIO	ALOCATIO	ALOCATED	PURPOSE	FLOOD				
MULTI-1	44.5	96,100,501	37,904,465	336,779	134,341,685	19,060,800	153,402,485					32,521,327				
MULTI-2	44	93,242,960	36,873,760	284,123	130,400,843	18,951,543	149,352,386					31,662,706				
MULTI-3	43.5	90,385,419	35,843,115	219,400	126,447,934	18,710,400	145,158,334					30,773,567				
MULTI-4	43	90,385,419	35,843,115	197,460	126,425,994	18,710,400	145,136,394					30,768,915				
POWER	43	87,527,877	34,612,470	0	122,340,347	16,462,685	140,802,432	1	44.4%	62,524,217	POWER					
IRRIGATION	39	66,508,302	27,176,830	0	93,685,132	15,003,207	108,688,339	0.771935097	34.3%	46,284,637	IRRIGATION					
FLOOD ONLY	32	40,105,611	17,030,440	274,250	57,410,301	10,179,247	67,589,548	0.480031257	21.3%	30,013,578	FLOOD ONLY					
								100%		140,802,432						

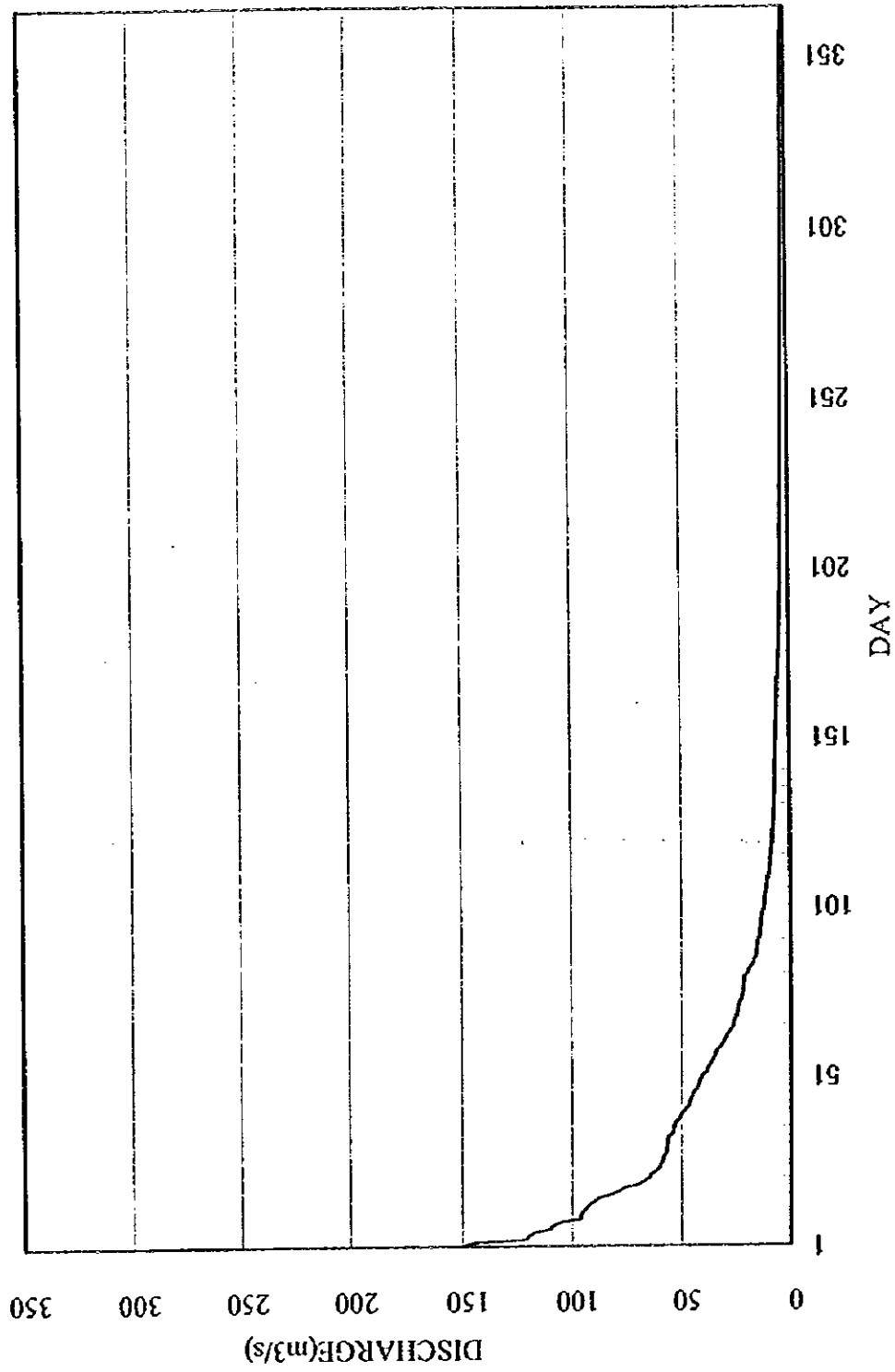


Figure 10.1 STREAMFLOW REGIME AT SAN ESTEBAN DAM SITE (1971)

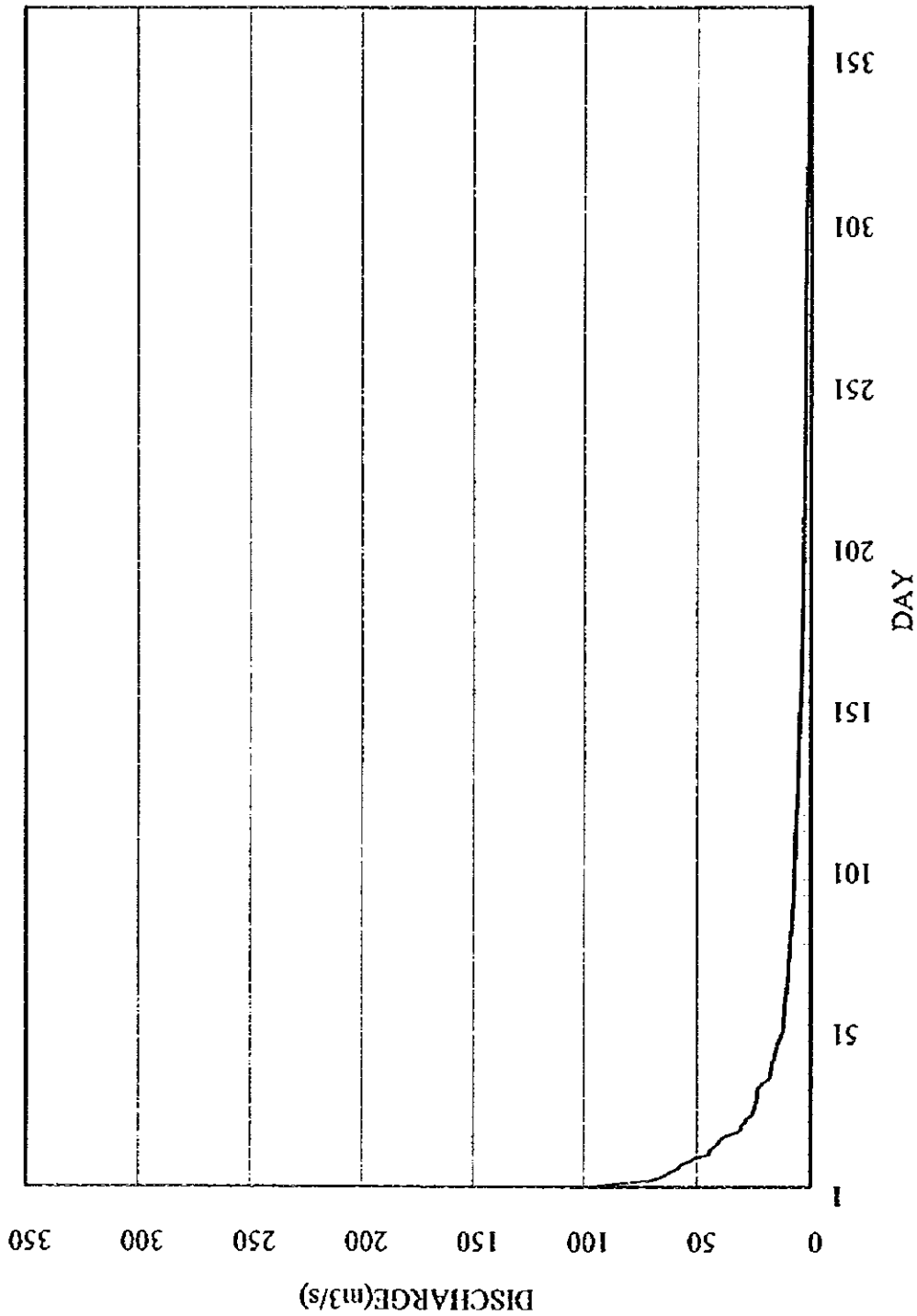


Figure 10.2 STREAMFLOW REGIME AT SAN ESTEBAN DAM SITE (1972)

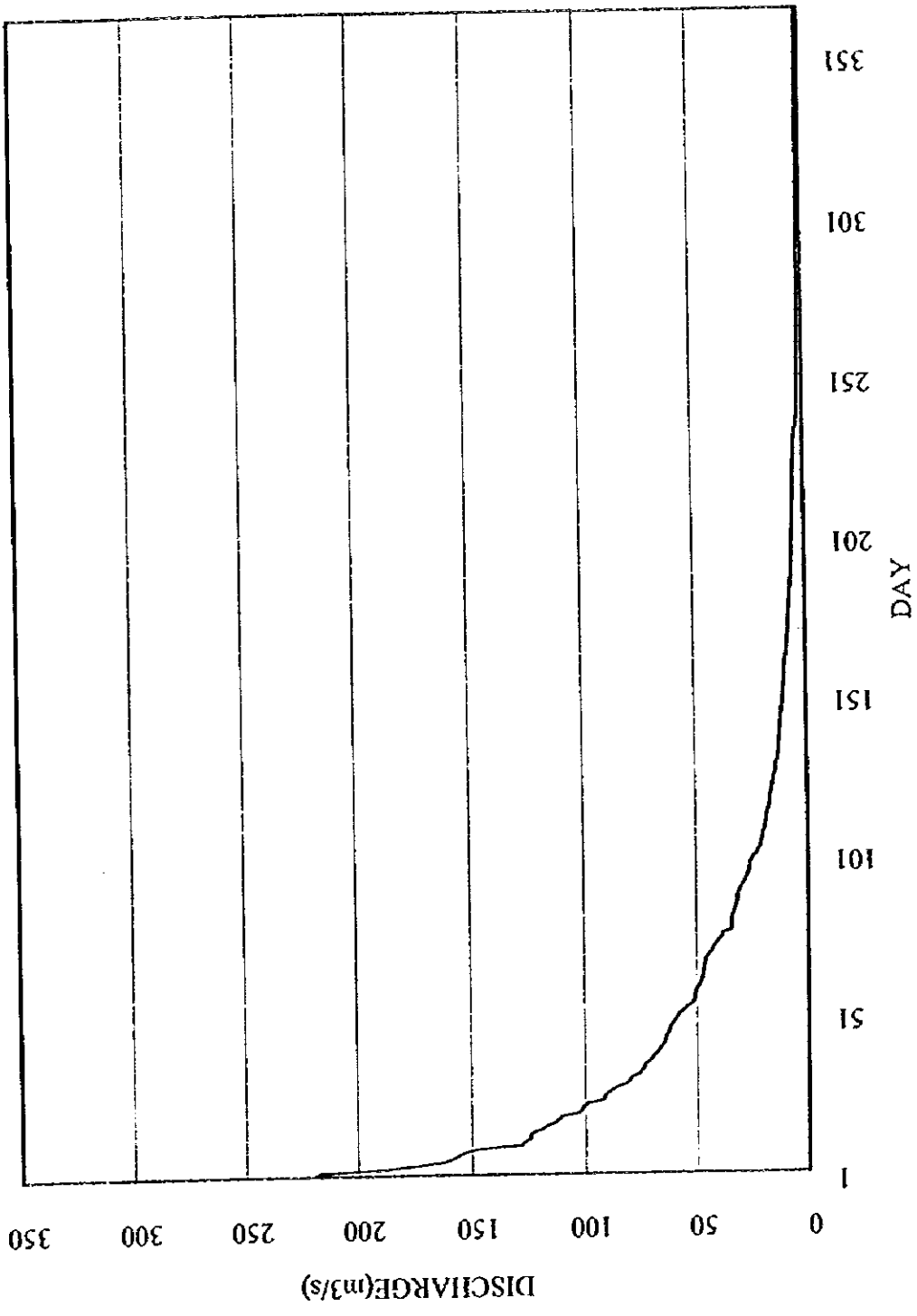


Figure 10.3 STREAMFLOW REGIME AT SAN ESTEBAN DAM SITE (1973)

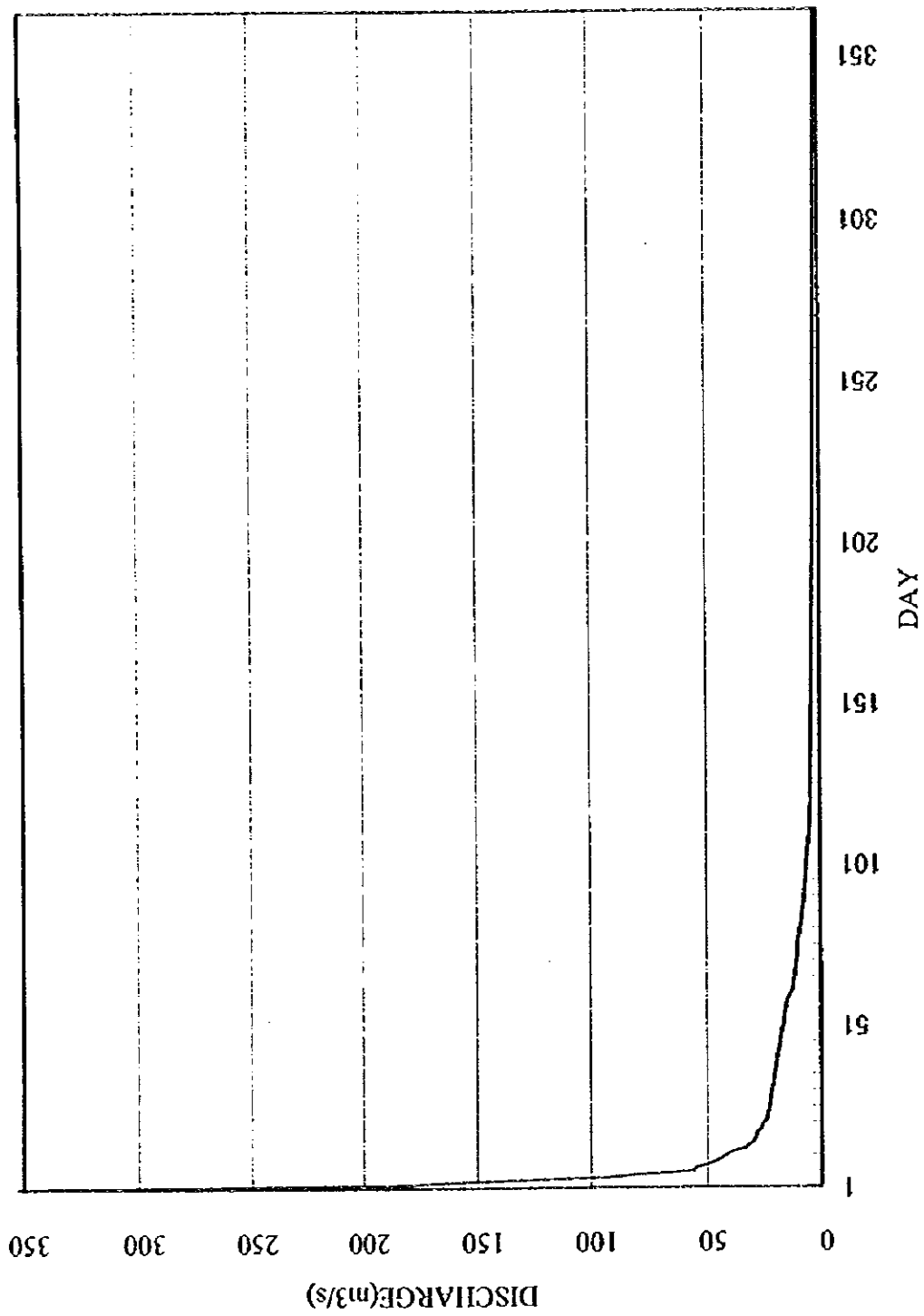


Figure 10.4 STREAMFLOW REGIME AT SAN ESTEBAN DAM SITE (1974)

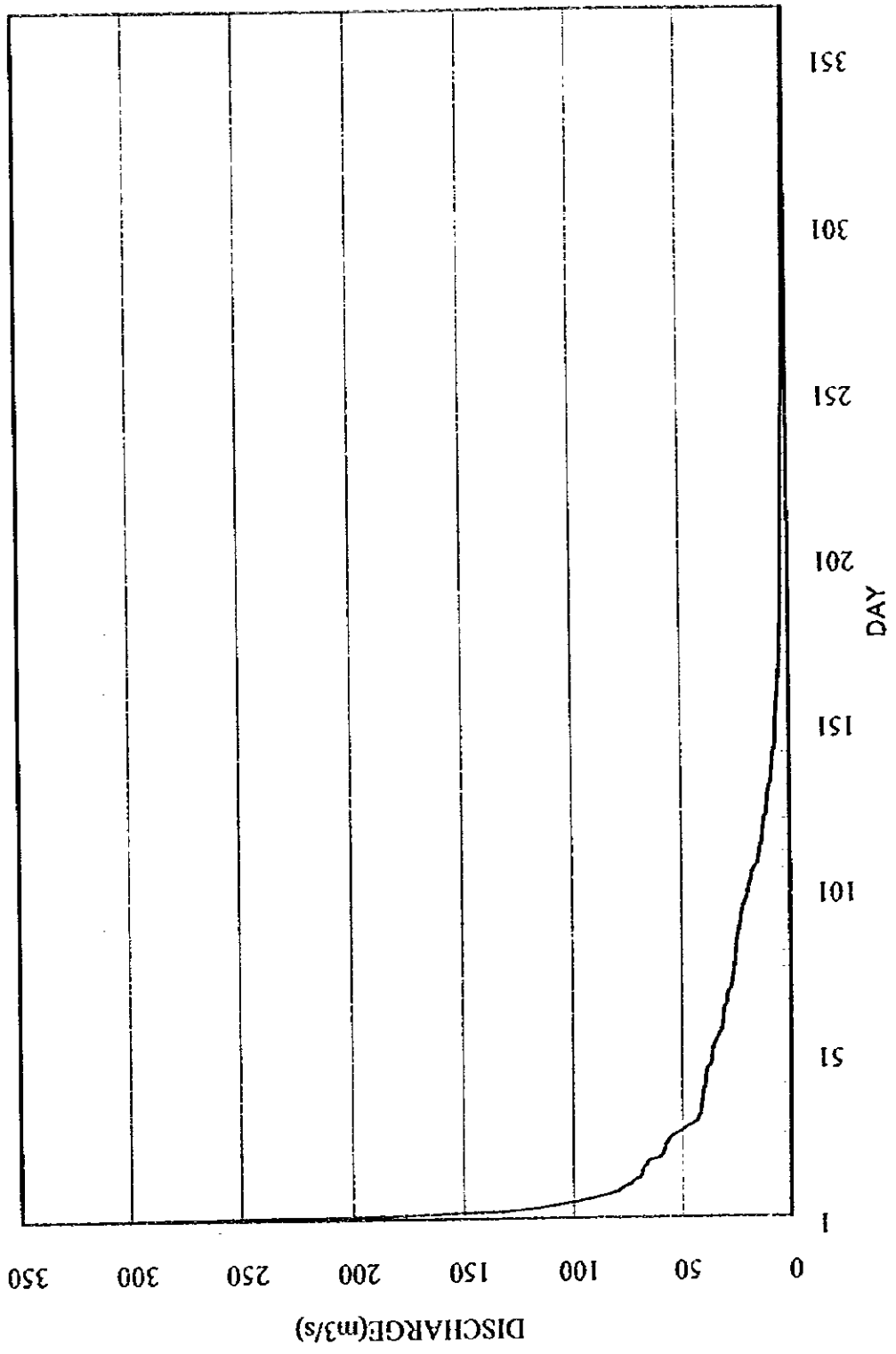


Figure 10.5 STREAMFLOW REGIME AT SAN ESTEBAN DAM SITE (1975)

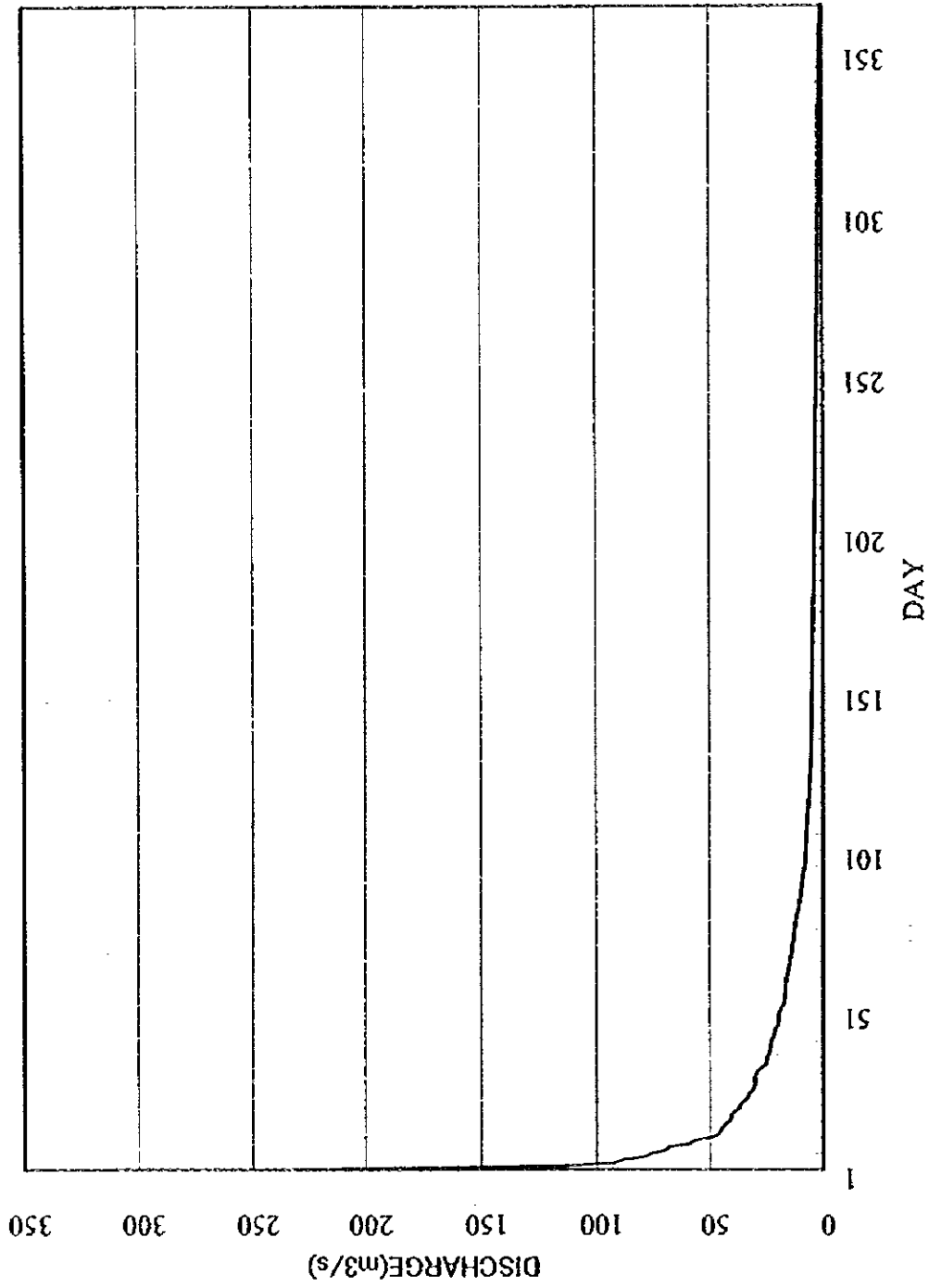


Figure 10.6 STREAMFLOW REGIME AT SAN ESTEBAN DAM SITE (1976)

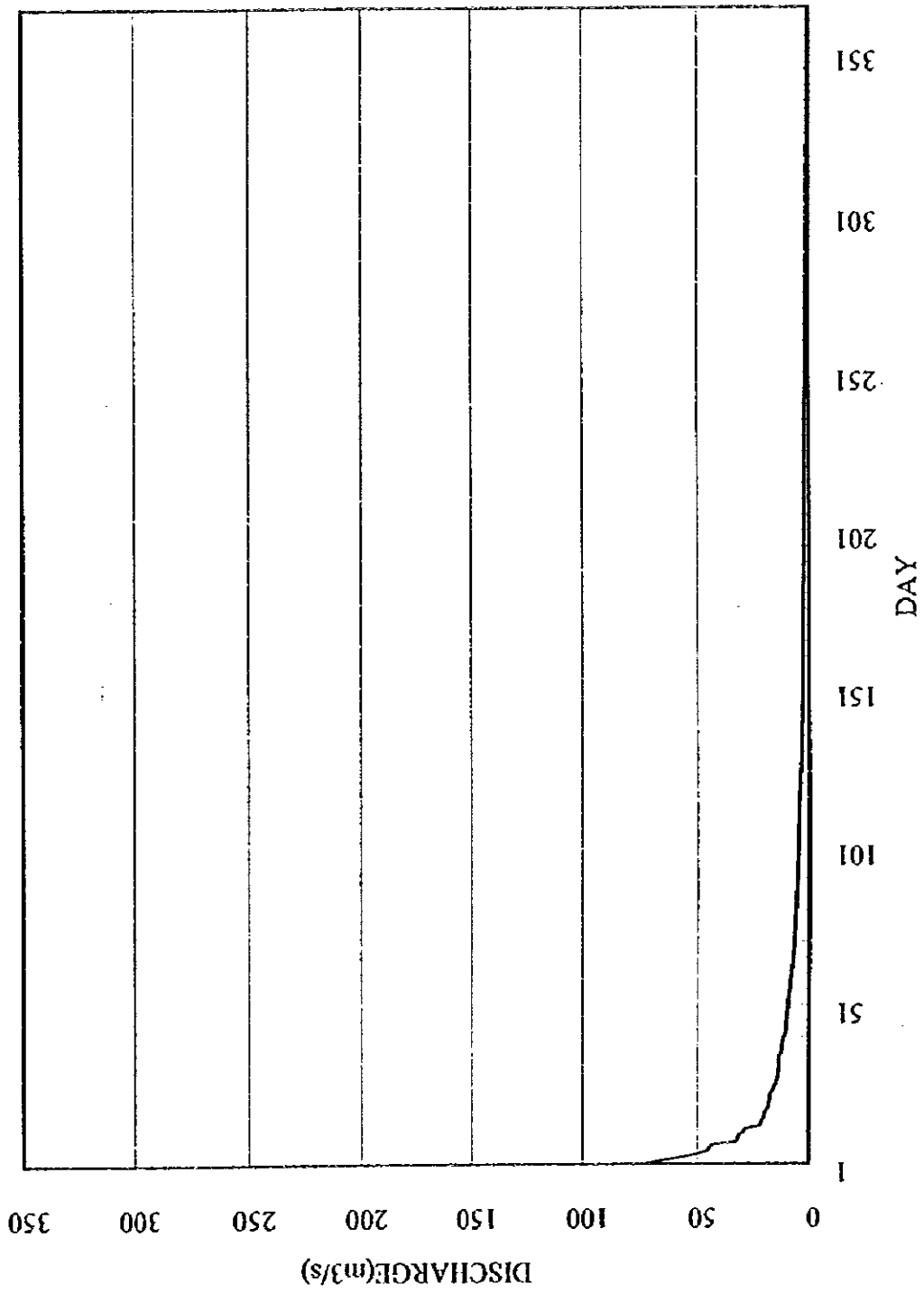


Figure 10.7 STREAMFLOW REGIME AT SAN ESTEBAN DAM SITE (1977)

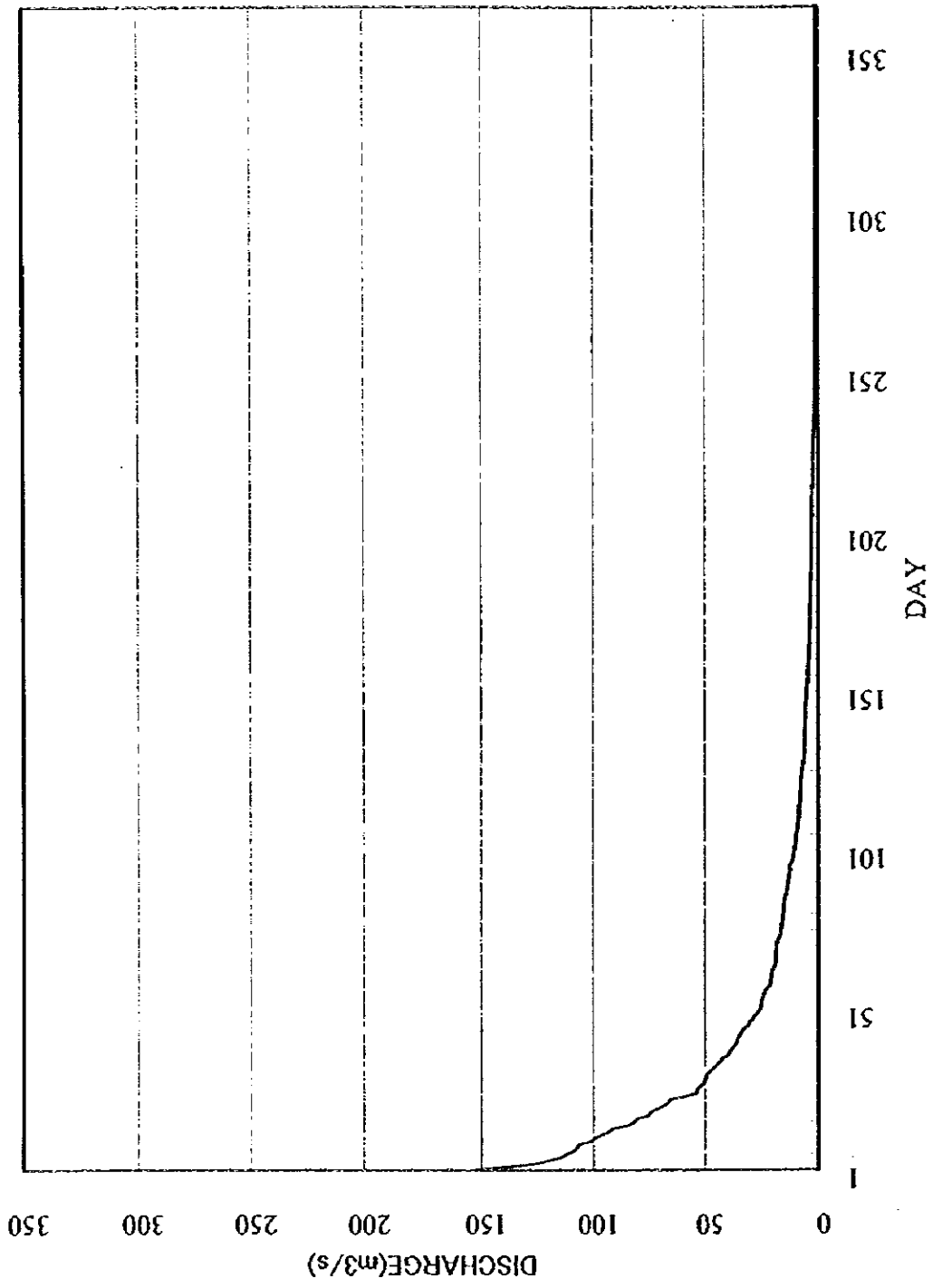


Figure 10.8 STREAMFLOW REGIME AT SAN ESTEBAN DAM SITE (1978)

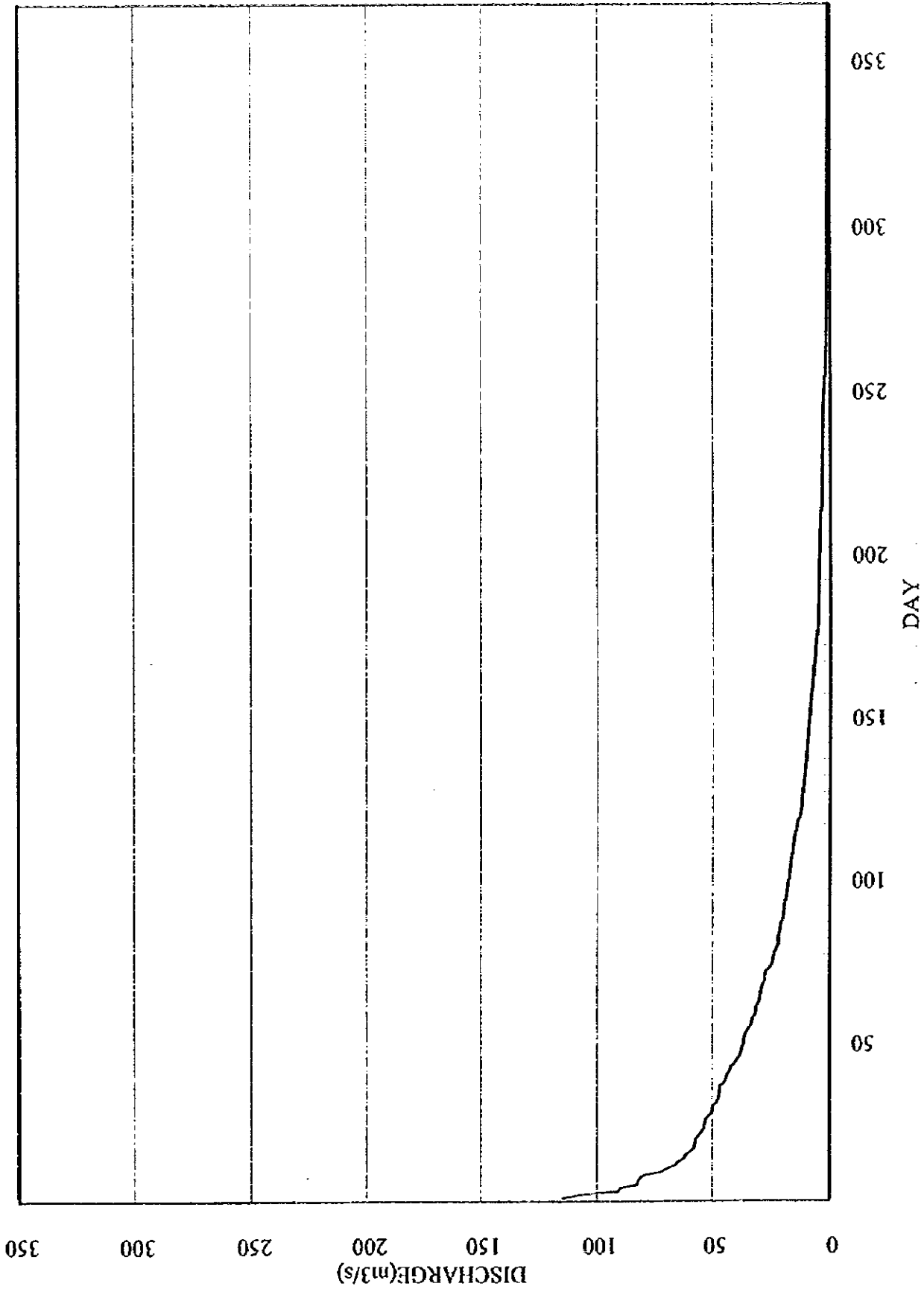


Figure 10.9 STREAMFLOW REGIME AT SAN ESTEBAN DAM SITE (1979)

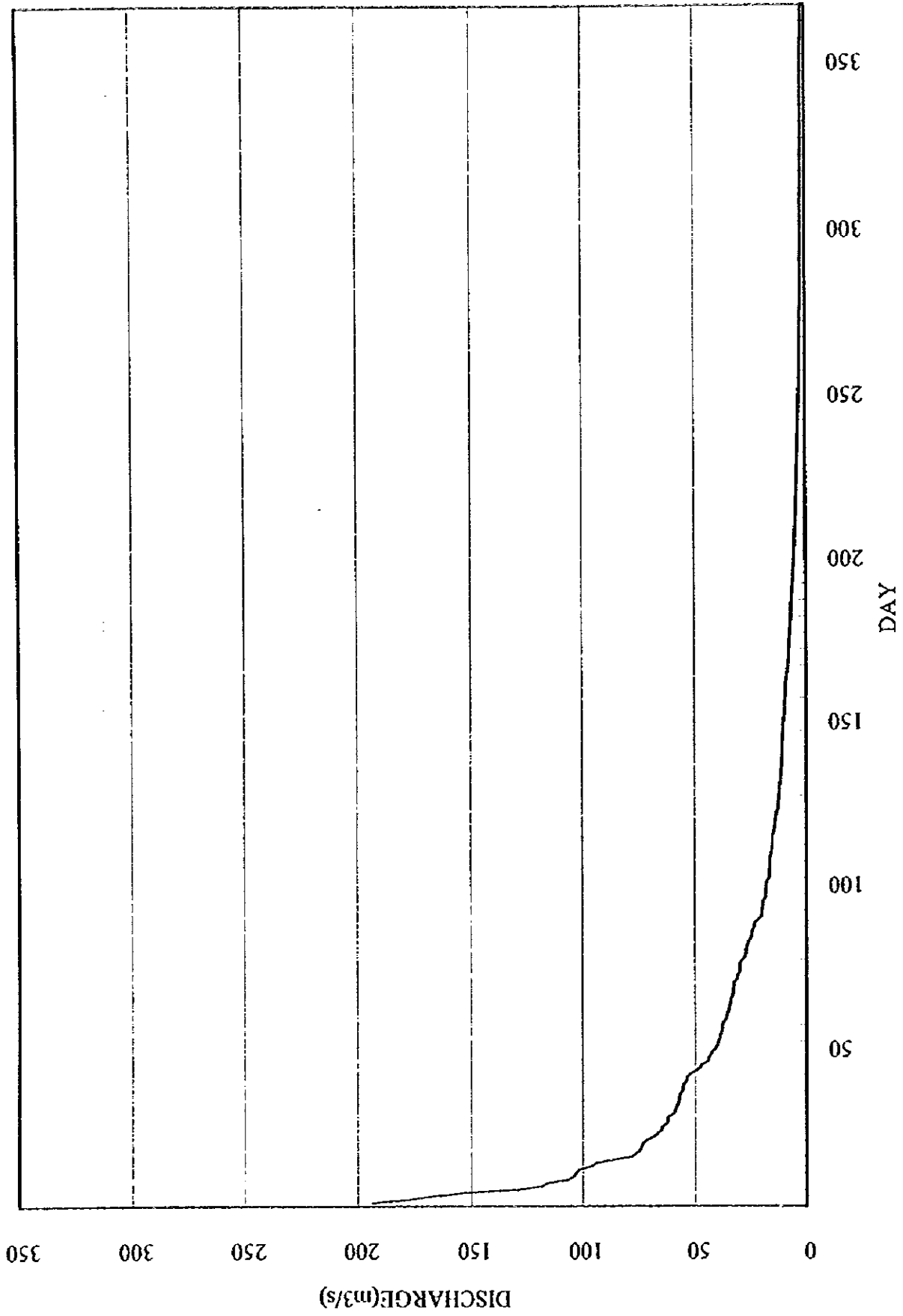


Figure 10.10 STREAMFLOW REGIME AT SAN ESTEBAN DAM SITE (1980)

CONCEPT OF COST ALLOCATION OF MULTI-PURPOSE DAM

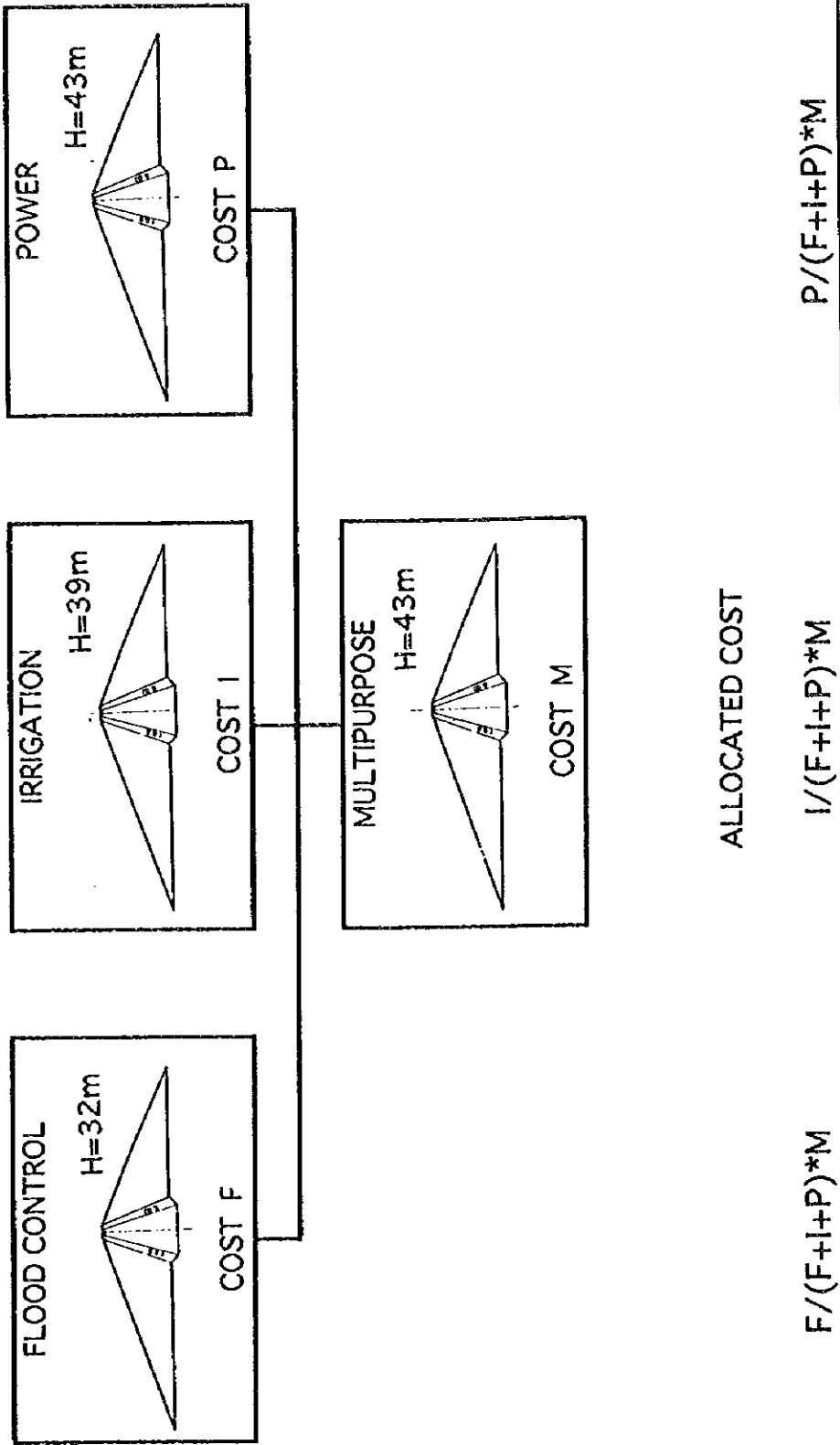
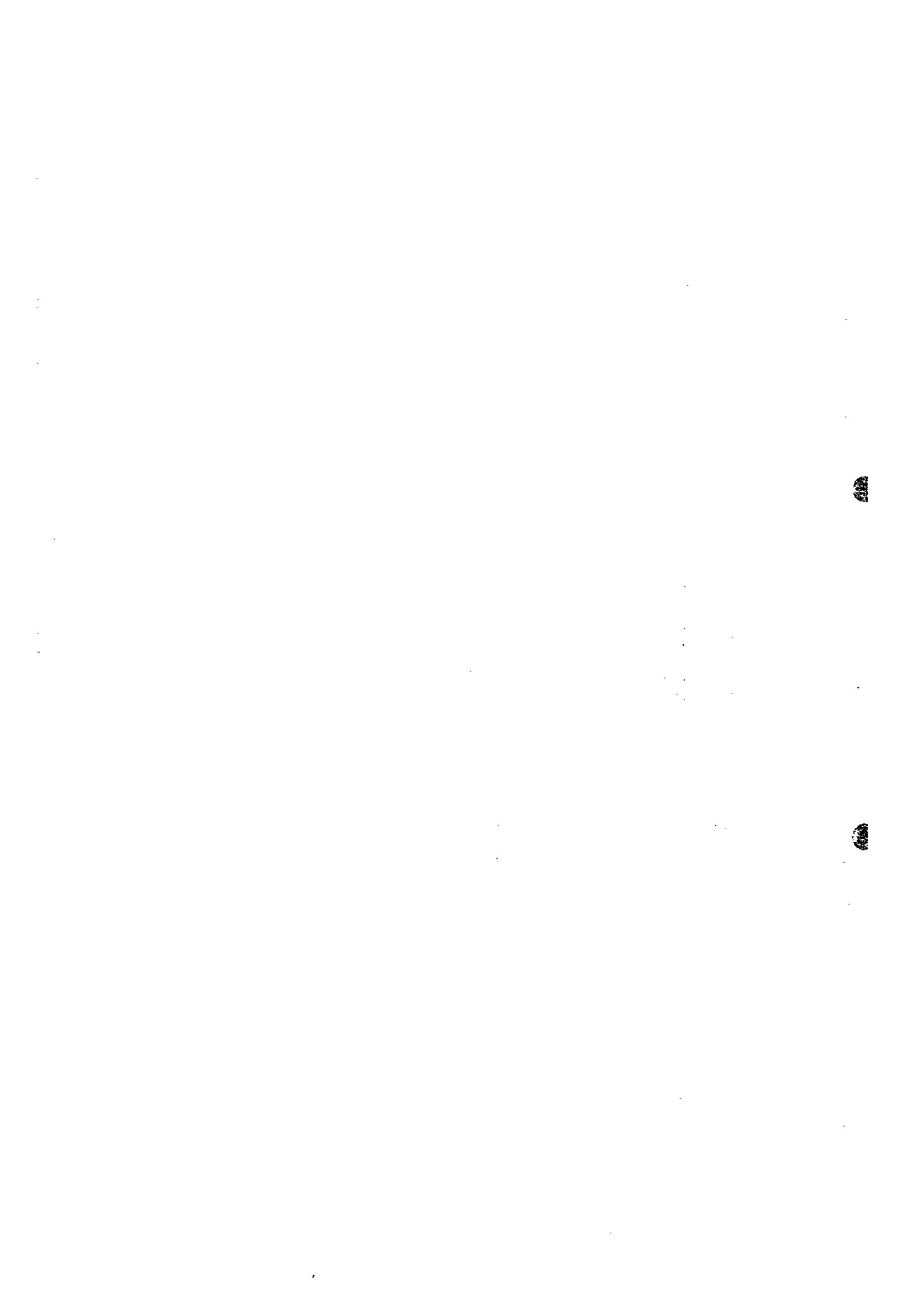


Figure 10.11 CONCEPT OF COST ALLOCATION OF MULTI-PURPOSE DAM









JICA