

PAIS COSTA RICA
 PLANTA HIDROELECTRICA CARRILLO
 CUENCA DEL RIO CHIRIFO

CAUDALES MEDIDOS MENSUALES DEL REGISTRO SINTETICO (EN M

ANO	ENE	FEB	MAR	ABR	MAY	JUN	JUL
1	42.1	27.8	17.3	32.8	40.4	39.6	34.8
2	23.1	17.7	21.1	15.7	25.0	66.0	62.4
3	30.6	18.5	21.5	24.1	30.0	72.2	41.7
4	8.5	6.6	10.3	19.5	32.0	45.1	52.1
5	14.3	10.5	10.5	1.6	22.7	55.9	50.1
6	22.9	20.7	14.9	16.7	49.5	46.7	53.1
7	26.4	8.9	14.5	20.3	28.4	45.1	45.7
8	28.2	48.1	23.5	20.7	35.0	39.6	45.7
9	26.6	46.1	21.9	35.4	30.6	47.3	57.6
10	30.8	22.1	20.7	10.3	28.6	33.4	44.3
11	34.8	30.2	29.2	28.4	31.4	48.3	56.3
12	20.1	49.7	23.5	21.9	17.9	37.8	33.6
13	38.0	11.3	15.3	22.1	38.2	54.7	61.0
14	32.4	3.9	17.9	25.2	52.3	62.8	50.4
15	14.5	12.3	8.5	18.3	24.8	31.4	44.9
16	42.9	27.2	20.7	22.9	53.9	49.3	58.8
17	36.6	17.9	23.9	16.7	17.5	51.3	40.2
18	39.0	39.8	36.4	31.2	30.2	50.3	46.7
19	40.2	46.1	23.7	23.3	59.2	82.1	61.8
20	25.6	6.6	16.1	17.3	65.0	47.1	50.7
21	19.7	7.4	16.9	28.2	38.8	63.6	54.2
22	32.0	39.4	25.0	22.5	38.8	47.3	50.7
23	26.4	22.1	11.5	9.1	19.1	57.1	55.7
24	36.4	27.8	15.7	22.7	43.9	64.0	40.6
25	7.4	5.2	4.6	15.3	25.4	49.9	58.0
26	26.2	15.5	27.4	25.4	37.0	45.1	53.1
27	18.7	22.9	14.7	20.7	44.3	54.9	50.9
28	53.5	49.9	29.0	32.4	42.5	45.9	38.8
29	28.2	21.1	13.3	12.1	55.1	61.2	37.8
30	25.4	18.5	7.8	5.0	42.3	36.6	48.5

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AGO	SEP	OCT	NOV	DIC	ANUAL
45.3	42.1	62.0	58.2	23.7	38.8
52.7	46.3	62.4	34.6	15.7	36.9
39.2	44.5	48.5	80.9	63.4	42.9
47.9	45.3	58.4	51.5	22.5	33.6
48.9	40.6	48.7	33.4	29.2	30.5
31.4	38.8	55.3	48.7	47.1	37.1
48.9	56.5	49.5	65.6	79.9	40.8
41.5	49.3	54.1	55.3	106.5	45.6
47.1	49.5	50.3	47.9	54.3	42.9
61.2	61.0	51.3	55.1	15.1	35.7
40.2	44.1	52.7	43.5	105.4	45.4
48.3	43.1	62.2	65.6	55.1	39.8
41.1	49.5	52.1	46.7	64.0	41.2
49.7	65.6	62.8	52.1	29.5	43.1
66.6	78.1	52.9	49.7	35.2	36.4
65.0	74.7	67.8	56.5	54.9	49.5
40.4	48.3	48.7	50.1	76.1	39.0
53.3	41.1	40.8	27.8	17.9	38.4
51.1	58.2	51.7	101.2	85.5	57.1
46.5	60.0	41.3	40.0	84.1	41.7
48.1	47.3	55.3	25.2	18.3	35.3
39.8	36.2	54.1	63.0	64.0	42.7
42.7	51.5	72.2	61.0	18.5	37.2
50.7	54.3	53.1	42.5	46.1	41.5
66.2	66.6	70.8	84.1	35.2	40.7
47.7	63.4	69.0	33.4	9.9	37.8
66.6	87.3	72.0	53.3	124.0	52.5
43.1	48.3	62.8	65.2	36.0	45.6
41.5	53.7	46.9	63.8	72.8	42.3
38.8	52.3	75.7	57.4	12.5	35.1

CCE/SC. S/GRIF/V/3
PAG. 159

CUADRO 134

PAIS COSTA RICA
 PLANTA HIDROELECTRICA SAN FERNANDO
 CUENCA DEL RIO SARAPIQUI
 CAUDALES MEDIOS MENSUALES DEL REGISTRO SINтетICO (EN M³/S)

CCE/SC.5/GRIE/V/3
 PAG 160

AÑO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1	21.6	12.3	5.4	15.6	20.6	19.3	16.5	22.1	19.2	32.3	30.7	9.1	18.7
2	9.1	5.5	7.6	4.2	9.4	32.7	35.4	29.2	24.7	34.1	16.4	4.9	17.8
3	13.6	6.2	7.7	9.7	13.0	27.2	25.6	21.0	23.5	24.0	46.4	33.9	21.8
4	1.3	11.5	1.7	6.9	17.2	23.0	27.4	24.8	25.6	30.9	27.0	8.9	17.2
5	4.0	1.3	1.6	6.9	10.2	27.6	27.0	25.7	19.6	23.1	14.9	12.3	14.5
6	9.0	7.6	4.1	5.3	26.5	25.9	29.6	16.3	19.6	28.4	25.1	23.4	18.4
7	11.2	11.5	3.7	7.5	11.9	20.9	22.4	24.6	30.0	24.7	36.4	43.8	20.7
8	12.6	25.5	9.3	7.6	16.5	18.1	21.6	19.7	24.5	27.2	29.3	60.0	22.7
9	11.9	24.4	8.4	17.1	13.5	22.8	30.1	24.5	25.7	25.1	24.7	28.0	21.3
10	14.0	8.4	7.3	0.7	11.9	12.1	18.3	31.3	32.3	26.1	26.3	4.7	16.1
11	16.4	13.4	12.4	12.1	13.7	23.5	29.6	20.5	22.1	26.3	21.6	59.6	22.6
12	8.2	26.6	9.5	8.5	4.3	13.7	12.6	22.5	18.6	31.8	35.2	27.7	18.3
13	18.5	1.3	4.2	8.6	18.8	29.2	34.7	22.3	27.3	27.1	24.4	34.3	20.9
14	15.0	11.5	5.7	10.5	28.5	36.9	36.3	28.6	35.8	37.0	28.9	14.6	24.4
15	4.3	2.6	0.5	6.8	9.7	10.1	17.7	34.8	44.9	29.2	27.1	17.6	17.1
16	21.9	11.7	7.4	9.0	29.6	28.5	34.1	37.5	46.0	41.4	32.2	30.2	27.5
17	17.5	5.7	9.3	4.8	3.9	22.5	19.2	19.2	23.8	23.3	25.8	41.1	18.0
18	19.2	19.8	16.8	13.7	12.8	28.2	25.4	28.6	19.9	17.6	11.4	5.5	18.2
19	19.5	23.3	9.2	9.2	33.1	48.9	32.0	31.3	36.3	29.1	61.3	49.7	32.8
20	11.3	11.5	5.0	5.7	37.2	29.0	30.0	25.5	34.7	20.4	20.5	47.4	23.2
21	7.3	11.5	5.4	12.6	19.4	34.6	32.3	26.7	25.7	29.2	10.4	6.5	18.5
22	14.6	19.4	9.0	8.5	19.1	24.3	27.0	20.1	16.5	26.6	33.9	33.4	21.1
23	11.3	8.4	2.2	0.5	5.4	26.5	29.3	21.8	27.2	41.4	33.5	7.1	17.9
24	17.5	12.0	4.5	9.1	22.7	35.9	25.7	29.4	30.9	28.5	21.9	23.6	21.7
25	0.6	11.5	6.7	6.2	10.9	24.0	30.5	36.9	38.8	42.2	49.5	18.5	23.0
26	11.2	4.3	11.5	10.3	17.8	22.4	27.7	24.6	35.6	40.0	16.3	2.0	18.6
27	6.4	9.0	4.0	7.8	23.1	30.5	29.5	38.5	55.2	45.7	30.8	73.8	29.5
28	29.3	26.0	12.4	14.8	21.6	24.1	20.5	21.7	24.6	33.9	35.9	17.1	23.6
29	12.3	7.7	3.1	2.4	30.4	36.5	25.2	22.1	30.7	24.0	35.8	40.0	22.6
30	11.0	6.3	0.2	6.9	22.6	17.6	23.6	18.5	27.1	43.7	31.0	3.3	17.6

Cuadro 135

COSTA RICA: CUENCAS DE LOS RIOS SARAPIQUI Y CRIRIPO. COMPARACION DE REGISTROS HISTORIOS Y GENERADOS.

Proyecto	Caudales medios mensuales (m ³ /s)												
	Ene.	Feb.	Marzo	Abril	Mayo	Junio	Julio	Agost.	Sept.	Oct.	Nov.	Dic.	Anual
<u>Toro Amarillo</u>													
Histórico	16.5	13.3	9.6	9.7	16.9	24.5	24.5	25.1	27.5	28.9	28.5	28.8	21.2
Sintético	14.1	11.7	9.2	9.9	18.2	25.5	24.7	24.0	26.5	28.3	26.6	24.5	20.3
<u>Carrillo</u>													
Histórico	33.2	26.7	19.3	19.5	34.0	49.2	49.2	50.5	55.3	58.1	57.3	57.9	42.5
Sintético	28.3	23.5	18.5	19.9	36.6	51.3	49.6	48.2	53.3	56.9	53.5	49.2	40.7
<u>San Fernando</u>													
Histórico	15.8	11.5	6.7	6.9	15.8	24.4	26.0	26.7	30.3	31.5	31.2	31.1	21.5
Sintético	12.8	12.0	6.3	8.3	17.8	26.2	26.9	25.7	29.0	30.5	28.8	26.0	20.9

PAIS COSTA RICA

PLANTA HIDROELECTRICA ARENAL

CUENCA DEL RIO SAN CARLOS

CAUDALES MEDIOS MENSUALES DEL REGISTRO HISTORICO (EN M³/S)CCE/SC.5/GRIE/V.3
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ANO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1958	42.1	33.7	24.9	17.0	16.7	24.7	47.6	46.8	57.7	40.3	45.7	38.1	35.3
1959	36.9	27.4	15.8	12.1	18.6	27.6	53.0	52.2	64.4	44.9	51.0	42.5	37.2
1960	41.1	30.6	17.6	13.5	20.0	29.7	57.1	49.8	67.6	56.9	74.4	83.2	45.1
1961	46.6	25.6	24.0	14.3	9.2	28.1	58.4	57.3	75.9	43.7	57.7	41.7	40.2
1962	49.4	26.9	18.0	13.0	13.6	50.4	54.1	64.7	51.2	69.4	55.4	72.5	44.9
1963	36.6	32.6	13.1	19.6	19.8	40.0	54.3	53.1	48.1	41.7	72.1	90.4	43.9
1964	51.8	23.6	16.8	13.7	14.4	30.7	73.6	75.1	63.5	66.3	48.1	43.3	43.4
1965	57.0	35.8	38.9	18.9	14.0	22.0	69.7	57.4	51.6	60.4	71.7	56.6	46.2
1966	77.5	71.7	44.6	25.7	38.4	57.2	52.2	62.6	50.3	66.9	61.9	98.2	59.0
1967	66.4	41.2	30.4	25.4	29.2	50.5	48.6	88.4	59.6	69.6	74.8	69.9	54.5
1968	43.1	49.4	33.0	37.4	32.9	56.3	58.2	57.5	50.8	46.9	88.2	76.5	52.5
1969	32.2	31.5	18.4	13.4	14.0	21.0	26.0	42.5	46.5	54.7	65.7	85.1	37.6
1970	66.8	70.0	39.9	43.0	35.0	52.3	61.1	62.8	75.1	65.3	72.6	139.0	65.2
1971	68.3	35.7	29.0	40.0	26.3	44.3	58.7	49.7	75.8	78.1	46.0	28.8	48.4
1972	68.9	31.8	22.8	18.3	29.4	29.1	51.8	51.2	57.9	49.6	48.1	46.5	42.1
1973	36.0	36.6	18.6	15.1	20.1	32.5	44.1	42.1	72.7	88.8	85.6	67.0	46.6
1974	50.7	30.7	31.9	16.8	21.0	56.5	59.7	57.9	53.5	87.1	59.4	68.9	49.5
1975	25.4	22.2	16.0	13.0	13.6	23.5	37.3	46.9	64.3	58.4	81.4	116.0	43.2

PAIS GUATEMALA

PLANTA HIDROELECTRICA ESTRELLA POLAR

CUENCA DEL RIO XATBAL

CAUDALES MEDIOS MENSUALES DEL REGISTRO HISTORICO

ANO	ENE	FEB	MAR	ABR	MAY	JUN
1944	14.8	12.6	12.3	9.6	16.4	46.3
1945	12.5	10.9	11.4	8.9	21.1	37.0
1946	19.1	13.9	11.4	8.5	3.4	46.4
1947	17.5	15.5	12.4	9.8	12.6	33.8
1948	24.4	22.5	11.3	8.1	4.6	76.0
1949	16.4	9.2	8.2	7.4	6.2	12.4
1950	24.0	25.6	13.2	10.2	23.6	55.2
1951	11.8	7.3	7.6	7.8	9.0	14.4
1952	15.1	9.9	8.5	5.0	1.8	74.7
1953	11.8	4.2	8.5	7.1	13.7	23.2
1954	20.9	16.5	9.7	4.2	7.7	54.1
1955	18.5	14.0	9.1	8.3	2.8	10.2
1956	16.9	10.6	9.2	10.1	34.9	32.3
1957	21.6	17.4	12.3	10.1	12.6	43.8
1958	11.5	8.9	8.4	9.8	24.9	59.1
1959	25.0	15.0	10.3	7.3	5.2	31.2
1960	19.6	9.2	7.6	5.4	9.3	20.5
1961	23.4	19.3	9.7	8.4	6.0	48.7
1962	11.7	4.3	8.3	4.5	3.2	30.4
1963	9.2	9.4	11.7	10.9	16.2	12.8
1964	12.1	9.0	9.5	8.9	11.1	51.6
1965	18.9	12.2	14.8	15.3	48.0	34.9
1966	21.8	18.0	11.1	7.5	9.2	58.3
1967	16.3	12.8	9.4	8.8	4.8	23.7
1968	17.4	11.7	8.5	6.6	7.8	32.8
1969	17.1	10.5	12.0	9.4	17.9	38.1
1970	16.7	15.6	11.1	9.1	5.7	16.5
1971	13.1	8.6	8.7	7.1	6.0	8.2
1972	18.3	19.7	8.3	7.0	5.2	19.8
1973	11.0	8.7	6.8	7.0	7.2	14.8

(EN M3/S)

JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
40.5	55.4	78.6	50.0	26.6	35.6	33.2
47.8	50.1	73.7	50.1	40.1	42.6	33.8
24.8	58.6	93.4	56.0	25.6	46.9	34.0
48.0	58.2	105.2	40.8	12.0	74.7	36.7
55.7	53.4	73.8	52.2	47.0	54.4	41.1
21.2	43.2	51.9	48.1	24.7	45.7	24.5
27.7	51.0	62.0	70.5	39.3	15.0	34.8
40.1	55.2	86.3	60.9	40.7	24.2	30.4
65.1	48.4	9.5	39.3	36.2	21.5	27.9
56.2	39.5	23.3	42.6	39.5	40.8	26.3
44.5	57.2	75.7	68.7	36.0	42.2	37.4
72.5	56.8	60.1	89.1	44.9	41.0	35.6
92.1	55.7	63.2	50.0	32.6	56.0	42.8
64.9	44.9	27.4	8.1	19.5	30.9	26.1
87.9	57.1	53.8	60.3	60.5	66.0	42.3
21.6	55.4	81.3	43.9	68.5	26.7	32.6
37.0	46.6	72.4	43.7	33.9	21.9	27.3
35.8	57.6	72.7	76.9	30.1	20.1	34.1
42.9	49.8	57.8	56.1	20.5	22.7	26.4
28.2	48.8	72.0	70.1	29.0	26.0	28.7
32.3	59.0	82.7	57.9	36.7	73.8	37.0
37.2	38.3	22.8	31.2	34.6	35.3	28.6
37.9	50.6	43.3	46.3	41.7	13.2	30.7
31.2	39.0	26.7	71.1	35.3	17.4	24.7
40.7	38.2	47.9	53.6	30.3	31.9	27.3
59.4	55.3	75.6	39.9	42.3	28.7	33.8
47.5	53.1	59.8	58.8	38.2	25.8	29.8
29.5	30.5	47.2	41.0	44.0	20.9	22.1
47.2	57.4	46.8	34.6	24.0	18.6	25.6
19.6	44.4	41.1	92.9	39.5	24.8	26.5

CUADRO

PAIS GUATEMALA
PLANTA HIDROELECTRICA ATITLAN
CUENCA DEL RIO NAHUALATE
CAUDALES MEDIOS MENSUALES DEL REGISTRO HISTORICO

ANO	ENE	FEB	MAR	ABR	MAY	JUN
1963	3.1	2.7	2.6	2.6	2.4	4.7
1964	2.8	2.3	2.1	2.2	2.1	6.7
1965	2.6	2.5	2.5	2.1	2.3	9.7
1966	2.6	2.3	2.2	2.3	2.6	7.3
1967	3.1	2.8	2.5	2.6	2.3	3.2
1968	2.3	2.0	2.2	2.0	2.2	5.9
1969	2.9	2.4	2.2	2.2	2.8	6.6

(EN M3/S)

JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
5.8	3.4	8.7	6.3	4.1	2.9	4.1
6.1	4.6	12.2	8.7	3.8	3.2	4.7
4.9	3.1	7.4	9.4	4.6	3.0	4.5
6.9	7.3	7.8	9.3	4.8	3.3	4.9
4.6	4.3	6.2	9.6	3.5	2.5	3.9
6.5	3.5	7.2	10.8	5.6	3.5	4.5
6.4	13.7	20.5	8.0	4.7	3.7	6.3

CUADRO 137

PAIS COSTA RICA
 PLANTA HIDROELECTRICA ARENAL
 CUENCA DEL RIO SAN CARLOS

CAUDALES MEDICOS MENSUALES DEL REGISTRO SINTETICO (EN M³/S)

ANO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1	62.9	39.8	24.7	38.0	33.2	39.2	37.9	46.6	51.3	74.3	66.5	46.3	46.7
2	38.1	28.0	25.0	14.5	13.9	48.9	66.6	58.6	48.9	71.0	36.6	19.0	39.1
3	45.4	27.9	24.9	22.8	19.9	60.7	35.3	39.7	59.0	48.6	86.8	85.5	46.4
4	19.8	16.2	11.6	20.6	11.9	23.4	56.9	53.1	56.0	62.9	60.7	43.0	36.3
5	26.6	20.0	13.0	1.1	7.5	31.8	50.1	51.0	47.1	47.6	44.2	39.6	31.6
6	36.1	30.3	19.4	16.2	26.9	37.2	60.5	47.8	59.3	65.3	59.9	62.0	43.4
7	41.0	17.0	15.2	17.2	16.4	29.1	48.8	51.7	62.7	44.0	75.5	93.4	42.7
8	42.9	55.5	33.4	23.6	23.9	30.2	51.7	48.1	61.7	56.4	66.2	106.1	50.0
9	38.8	52.4	30.9	40.8	29.1	44.6	68.1	56.8	56.5	47.8	60.2	68.0	49.5
10	46.6	32.3	25.4	10.7	14.7	15.7	49.8	67.9	55.9	42.4	61.2	39.1	38.5
11	53.9	41.9	37.1	29.5	23.9	39.9	65.0	52.3	57.0	55.6	54.8	98.4	50.8
12	30.0	53.0	31.9	23.7	14.0	21.7	33.1	47.4	50.0	73.5	72.9	72.6	43.6
13	56.9	18.9	16.2	19.5	22.5	43.2	69.1	53.9	61.9	52.6	58.5	73.3	45.5
14	47.9	15.8	17.7	21.9	30.1	56.3	63.8	56.1	71.8	65.4	58.9	45.5	45.9
15	26.2	21.6	11.8	18.1	15.5	15.5	51.7	79.2	69.1	39.4	59.6	52.3	38.3
16	64.1	39.1	27.6	23.9	32.7	44.9	69.0	74.9	66.9	67.5	60.7	63.0	52.9
17	53.7	27.1	27.4	15.3	9.8	31.0	37.9	41.9	61.8	47.5	63.2	85.5	41.8
18	56.8	50.2	46.7	33.8	25.3	49.8	48.8	55.4	43.8	32.9	41.3	31.7	43.0
19	60.3	57.0	34.8	27.2	37.0	82.4	64.5	56.6	62.3	46.8	97.1	99.9	60.5
20	39.5	14.2	15.8	13.0	31.6	39.2	57.2	52.6	68.5	21.2	55.6	87.7	42.2
21	30.9	15.0	16.9	25.9	25.6	55.5	57.4	52.9	53.8	57.6	24.9	12.4	35.7
22	46.3	47.9	32.9	23.9	25.6	38.8	57.1	49.1	50.0	61.5	73.3	81.4	49.0
23	41.1	32.1	17.5	9.8	9.3	36.0	58.8	50.3	62.9	93.8	65.7	39.0	43.0
24	55.7	39.6	23.3	25.0	28.7	58.2	37.7	49.6	59.0	50.7	52.7	56.3	44.7
25	17.1	13.7	6.5	14.0	13.9	32.1	64.6	75.2	57.2	76.9	83.5	56.9	42.6
26	41.6	25.7	31.5	23.8	23.9	35.2	60.9	54.7	71.0	79.6	27.9	4.0	40.0
27	28.7	30.8	19.2	20.4	26.4	46.1	55.0	76.0	80.3	71.2	54.9	103.9	51.1
28	72.4	59.6	39.9	36.3	33.1	44.9	41.6	45.6	59.4	73.9	72.3	57.9	53.1
29	44.5	31.7	18.8	12.4	27.9	51.7	33.7	41.0	66.7	42.7	75.1	89.3	44.6
30	39.7	28.2	13.7	6.0	19.5	21.0	55.4	48.2	67.2	103.3	60.7	30.5	41.1

Cuadro 138

COSTA RICA: CUENCAS DE LOS RIOS SAN CARLOS Y BEBEDERO. COMPARACION DE REGISTROS HISTORICOS Y GENERADOS.

Proyecto	Caudales medios mensuales (m ³ /s)												
	Ene.	Feb.	Marzo	Abril	Mayo	Junio	Julio	Agosto	Sept.	Oct.	Nov.	Dic.	Anual
<u>Arenal</u>													
Histórico	49.8	36.5	25.5	20.6	21.5	37.6	53.6	56.6	60.4	60.5	64.4	70.2	46.4
Sintético	43.5	32.7	23.7	21.0	22.5	40.1	53.6	54.5	60.0	59.5	61.0	61.4	44.4

CUADRO 139

PAIS COSTA RICA
 PLANTA HIDROELECTRICA BLGU
 CUENCA DEL RIO SIXACLA
 CAUDALES MEDICOS MENSUALES DEL REGISTRO HISTORICO (EN M³/S)

ANO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1955	13.1	11.4	8.4	5.5	11.0	15.5	17.8	15.7	16.1	22.5	22.9	21.5	15.1
1956	21.3	14.6	11.5	12.0	22.7	19.3	26.7	20.0	21.9	24.1	15.6	19.0	19.1
1957	14.4	8.0	7.7	8.1	13.1	16.4	16.8	17.3	22.0	23.9	18.5	19.3	15.5
1958	13.4	13.8	8.1	7.2	19.5	20.3	17.7	18.2	13.8	15.3	13.4	10.6	14.3
1959	7.0	6.0	5.2	5.8	9.3	18.9	16.1	16.1	16.5	21.6	16.4	14.6	12.8
1960	13.7	10.7	9.4	9.7	11.6	16.7	19.1	14.8	16.3	24.1	17.3	18.2	15.1
1961	10.5	8.7	6.4	6.1	10.8	16.1	17.3	15.2	21.3	20.8	20.2	20.9	14.5
1962	12.8	8.0	6.2	7.6	13.7	17.8	20.0	16.9	20.7	23.3	33.6	22.5	16.9
1963	11.6	11.0	10.0	12.1	16.4	16.4	17.4	17.7	22.1	19.9	23.7	16.5	16.2
1964	15.0	6.9	5.0	5.3	10.4	17.3	23.1	20.8	22.7	21.9	17.9	11.3	14.8
1965	19.0	11.5	11.5	6.8	15.0	19.7	17.5	21.5	19.6	22.0	20.9	15.3	16.7
1966	16.9	18.4	10.7	10.0	19.6	21.2	18.9	20.6	20.2	21.9	20.1	27.3	18.8
1967	16.9	11.4	9.7	14.2	14.0	23.9	19.6	22.3	23.3	24.3	20.6	15.6	18.0
1968	10.7	15.5	13.5	13.3	17.2	22.5	23.3	22.0	28.5	21.4	21.5	18.8	19.0
1969	10.0	8.1	6.3	8.9	10.2	16.3	13.3	22.3	23.3	23.1	27.9	22.0	16.0
1970	19.1	24.5	10.6	34.6	21.3	22.7	22.9	18.8	22.5	22.5	28.5	51.1	24.9
1971	19.5	11.4	12.4	10.7	12.1	15.2	20.3	13.1	17.6	21.3	17.4	12.5	15.3
1972	17.5	9.3	8.5	13.7	15.3	17.4	15.7	20.3	20.6	29.5	21.3	21.2	17.5
1973	14.3	10.0	5.5	6.5	12.5	21.3	16.9	14.9	16.1	18.7	26.5	38.3	16.8
1974	23.8	10.9	8.5	7.6	18.1	24.6	19.6	21.3	13.1	21.5	16.2	23.5	17.4
1975	9.6	9.3	5.5	5.1	9.1	16.4	22.7	24.1	24.5	22.5	29.9	36.6	17.9
1976	15.6	11.5	9.3	6.9	14.1	18.9	27.9	19.5	16.2	17.5	26.1	14.8	16.5

CUADRO 140

PAIS COSTA RICA
 PLANTA HIDROELECTRICA DUPIKA
 CUENCA DEL RYF STANIA
 CAUDALES MEDICOS MENSUALES DEL REGISTRO HISTORICO (EN M3/S)

ANO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1955	12.3	10.7	7.9	5.2	10.3	14.6	16.7	14.8	15.1	21.1	21.5	20.2	14.2
1956	20.0	13.7	10.8	11.3	21.3	18.1	25.1	18.8	20.6	22.6	14.7	17.9	17.9
1957	13.5	7.5	7.2	7.6	12.2	15.4	15.8	16.3	20.7	22.5	17.4	18.1	14.5
1958	12.6	13.0	7.6	6.0	13.3	19.1	16.6	17.1	13.0	14.4	12.6	10.0	13.4
1959	6.6	5.6	4.0	5.4	8.7	17.8	15.1	15.1	15.5	20.3	15.4	13.7	12.0
1960	11.9	10.1	3.3	9.1	10.0	15.7	17.9	13.9	15.3	22.6	16.3	17.1	14.2
1961	9.0	3.2	5.0	5.7	10.1	15.1	16.3	14.3	20.0	19.5	19.0	19.6	13.6
1962	12.0	7.5	5.3	7.1	12.9	16.7	18.8	15.9	19.4	21.9	31.6	21.1	15.9
1963	10.0	10.3	3.4	11.4	15.4	15.4	16.3	16.6	20.8	18.7	22.3	15.5	15.2
1964	14.1	6.5	4.7	5.0	9.8	16.3	21.7	19.5	21.3	20.6	16.8	10.6	13.9
1965	17.9	10.8	10.8	6.4	14.1	18.5	16.4	20.2	19.4	20.7	19.6	14.4	15.7
1966	15.0	17.3	10.1	3.4	18.4	19.0	17.8	19.4	18.0	20.6	18.9	25.7	17.7
1967	15.0	20.7	3.1	13.3	13.2	22.5	18.4	21.0	21.9	22.8	19.4	14.7	16.9
1968	10.1	14.6	12.7	12.5	16.2	21.1	21.9	20.7	26.8	20.1	20.2	17.7	17.9
1969	9.4	7.6	3.9	3.4	9.5	15.7	12.5	21.0	21.9	21.7	26.2	20.7	15.0
1970	17.0	23.0	10.0	32.5	20.0	21.3	21.5	17.7	21.1	21.1	26.5	48.0	23.4
1971	18.4	10.7	11.7	10.1	11.4	14.3	19.1	12.3	16.5	20.0	16.3	11.7	14.4
1972	16.4	3.7	3.0	12.9	14.4	16.3	14.8	19.1	19.4	27.7	20.0	19.6	16.5
1973	13.4	9.4	3.2	6.1	11.7	20.0	15.9	14.0	15.1	17.6	24.9	36.0	15.8
1974	22.4	10.2	3.0	7.1	17.0	23.1	13.4	20.0	12.3	20.2	15.2	22.1	16.3
1975	9.0	3.7	3.2	4.8	3.6	15.4	21.3	22.6	23.0	21.1	29.1	34.4	16.8
1976	14.7	10.8	3.7	6.5	13.2	17.8	26.2	18.3	15.2	16.4	24.5	13.9	15.5

CUADRO 141

PAIS COSTA RICA
 PLANTA HIDROELECTRICA BUGU
 CUENCA DEL RIO SIXACLA
 CAUDALES MEDICOS MENSUALES DEL REGISTRO SINTETICO (EN M3/S)

ANO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1	15.4	10.1	7.4	24.4	19.7	18.4	15.9	18.1	16.3	23.9	21.7	13.5	17.1
2	10.9	8.8	9.2	7.0	11.2	22.2	22.7	18.7	16.1	23.4	12.4	7.7	14.2
3	12.5	8.4	9.0	10.8	13.0	24.2	16.4	15.5	17.2	19.2	30.9	27.6	17.1
4	7.5	7.0	5.9	1.5	13.5	17.6	20.2	17.9	18.0	22.0	15.8	12.9	13.6
5	7.8	7.2	5.7	1.5	10.6	19.5	18.8	18.1	14.8	19.0	14.6	13.7	12.6
6	10.6	9.7	7.1	7.1	18.3	19.0	20.8	12.3	15.5	21.5	19.4	19.3	15.0
7	12.2	6.2	6.9	9.4	12.5	17.3	18.0	18.5	20.6	19.2	26.0	30.2	16.4
8	13.8	19.1	11.0	10.2	14.7	16.6	18.4	16.2	18.7	20.7	21.9	34.7	18.0
9	13.2	18.5	10.4	25.6	16.8	19.6	22.6	17.5	18.0	19.4	19.8	21.8	18.6
10	14.0	10.0	9.1	5.6	12.6	14.6	18.1	22.3	21.1	19.5	20.5	12.1	15.0
11	14.9	12.0	11.8	12.8	13.5	18.4	21.7	15.1	16.6	20.3	17.8	32.9	17.3
12	10.8	20.0	11.3	11.2	9.5	14.9	14.7	18.9	16.3	23.8	24.2	22.3	16.5
13	16.6	6.7	7.1	10.8	15.7	20.5	23.2	15.2	18.3	20.0	19.1	23.7	16.4
14	14.5	6.2	7.9	12.8	20.0	23.5	21.9	18.1	23.2	23.0	19.2	14.0	17.0
15	7.9	7.7	4.9	9.8	11.8	13.9	18.3	23.9	26.6	19.9	20.1	16.9	15.1
16	18.1	10.8	8.9	10.2	19.9	20.0	23.0	22.9	25.2	24.2	19.9	19.9	18.6
17	15.6	8.3	9.9	7.4	8.8	18.0	16.0	16.0	18.5	19.2	20.9	27.7	15.5
18	17.2	15.2	14.4	14.3	13.2	20.3	18.0	19.7	14.7	16.8	13.9	11.6	15.8
19	16.7	16.9	10.4	10.8	21.5	28.5	22.2	18.2	20.4	19.6	36.3	33.6	21.3
20	13.3	6.3	7.6	7.4	22.6	20.1	20.2	17.6	21.9	17.5	18.6	29.6	16.9
21	10.7	6.4	7.9	17.1	17.3	23.3	20.4	17.7	17.1	20.9	9.6	7.7	14.7
22	13.0	14.8	10.7	10.2	15.6	18.6	19.8	15.3	14.1	21.0	24.5	25.5	16.9
23	12.8	10.4	6.0	3.5	9.1	19.4	20.6	15.8	18.9	27.9	21.2	10.9	14.7
24	15.2	11.1	7.2	11.2	17.4	23.2	16.6	19.3	19.8	20.2	17.3	18.5	16.4
25	6.0	6.1	3.7	8.1	11.8	18.4	22.1	23.2	22.2	25.7	28.8	17.2	16.1
26	12.1	8.2	11.1	11.0	15.0	17.9	20.7	17.8	22.8	25.5	10.4	4.3	14.7
27	8.0	10.2	7.1	9.8	17.3	20.8	19.6	23.5	29.5	25.3	18.0	35.0	18.7
28	22.1	17.5	12.0	16.2	17.5	18.9	16.4	17.1	18.4	23.9	24.0	17.3	18.4
29	12.9	9.7	6.5	4.8	19.6	22.8	16.1	16.6	20.4	18.8	25.8	28.8	16.9
30	12.8	9.4	4.7	1.6	15.8	16.0	19.5	15.2	19.9	29.9	19.4	8.3	14.4

PAIS COSTA RICA
 PLANTA HIDROELECTRICA DURIKA
 CUENCA DEL RIO SIXACLA

CAUDALES MEDICOS MENSUALES DEL REGISTRO SINTETICO (EN M

ANO	ENE	FEB	MAR	ABR	MAY	JUN	JUL
1	14.5	9.5	7.0	22.9	18.5	17.3	14.9
2	10.2	8.3	8.6	6.6	10.5	20.9	21.3
3	11.7	7.9	3.5	10.1	12.2	22.7	15.4
4	7.0	6.6	5.5	1.4	12.7	16.5	19.0
5	7.3	6.8	5.4	1.4	10.0	18.3	17.7
6	10.0	9.1	6.7	6.7	17.2	17.9	19.5
7	11.5	5.8	6.5	3.8	11.7	16.3	16.9
8	13.0	17.9	10.3	9.6	13.8	15.6	17.3
9	12.4	17.4	9.8	24.1	15.8	18.4	21.2
10	13.2	9.4	8.6	5.3	11.8	13.7	17.0
11	14.0	11.3	11.1	12.0	12.7	17.3	20.4
12	10.1	19.8	10.6	10.5	8.9	14.0	13.8
13	15.6	6.3	6.7	10.1	14.8	19.3	21.8
14	13.6	5.8	7.4	12.0	18.8	22.1	20.6
15	7.4	7.2	4.6	9.2	11.1	13.1	17.2
16	17.0	10.1	3.4	9.6	18.7	18.8	21.6
17	14.7	7.8	9.3	7.0	8.3	16.9	15.0
18	16.2	14.3	13.5	13.4	12.4	19.1	16.9
19	15.7	15.9	9.3	10.1	20.2	26.8	20.9
20	12.5	5.9	7.1	7.0	21.2	18.9	19.0
21	10.1	6.0	7.4	16.1	16.3	21.9	19.2
22	12.2	13.9	10.1	9.6	14.7	17.5	18.6
23	12.0	9.8	5.6	3.3	8.6	18.2	19.4
24	14.3	10.4	6.8	10.5	16.3	21.8	15.6
25	5.6	5.7	3.5	7.6	11.1	17.3	20.8
26	11.4	7.7	10.4	10.3	14.1	16.8	19.4
27	7.5	9.6	6.7	9.2	16.3	19.5	18.4
28	20.8	16.4	11.3	15.2	16.4	17.8	15.4
29	12.1	9.1	6.1	4.5	18.4	21.4	15.1
30	12.0	8.8	4.4	1.5	14.8	15.0	18.3

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AGO	SEP	OCT	NOV	DEC	ANUAL
17.0	15.3	22.5	20.4	12.7	15.0
17.6	15.1	22.0	11.7	7.2	13.3
14.6	16.2	18.0	29.0	25.9	16.0
16.8	16.9	20.7	18.6	12.1	12.8
17.0	13.5	17.9	13.7	12.9	11.9
11.6	14.6	20.2	18.2	18.1	14.1
17.4	19.4	18.0	24.4	28.4	15.4
15.2	17.6	19.4	20.6	32.6	16.9
16.4	16.9	18.2	18.6	20.5	17.5
21.0	19.6	18.3	19.3	11.4	14.1
14.2	15.6	19.1	16.7	30.9	16.3
17.8	15.3	22.4	22.7	21.0	15.5
14.3	17.2	16.8	17.9	22.3	15.4
17.0	21.6	21.6	18.0	13.2	16.0
22.5	25.0	18.7	18.9	15.9	14.2
21.5	23.7	22.7	18.7	18.7	17.5
15.0	17.4	18.0	19.6	26.0	14.6
18.5	13.8	15.8	13.1	10.9	14.8
17.1	19.2	13.4	34.1	31.6	20.0
16.5	20.6	16.4	17.5	27.8	15.9
16.6	16.1	19.6	9.0	7.2	13.8
14.4	13.2	19.7	23.0	24.0	15.9
14.8	17.8	26.2	19.9	10.2	13.8
18.1	18.6	19.0	16.3	17.4	15.4
21.8	20.9	24.1	27.1	16.2	15.1
16.7	21.4	24.0	9.8	4.0	13.8
22.1	27.7	23.8	16.9	32.9	17.5
16.1	17.3	22.5	22.6	16.3	17.3
15.6	19.2	17.7	24.2	27.1	15.9
14.3	18.7	28.1	18.2	7.8	13.5

Cuadro 143

COSTA RICA: CUENCA DEL RIO SIXALOA. COMPARACION DE REGISTROS HISTORICOS Y GENERADOS.

Proyecto	Caudales medios mensuales (m ³ /s)												
	Ene.	Feb.	Marzo	Abril	Mayo	Junio	Julio	Agost.	Sept.	Oct.	Nov.	Dic.	Anual
<u>Bugú</u>													
Histórico	14.8	11.4	8.6	9.9	14.4	18.9	19.6	18.8	19.9	22.0	21.7	21.4	16.8
Sintético	13.0	10.6	8.4	10.1	15.2	19.5	19.4	18.1	19.4	21.7	20.7	20.0	16.3
<u>Durika</u>													
Histórico	13.9	10.7	8.1	9.3	13.5	17.8	18.4	17.7	18.7	20.7	20.4	20.1	15.8
Sintético	12.2	10.0	7.9	9.5	14.3	18.3	18.2	17.0	18.2	20.4	19.3	18.8	15.3

Cuadro 144

PANAMA: CARACTERISTICAS DE LOS APROVECHAMIENTOS HIDROELECTRICOS

Número	Nombre	Río y cuenca	Estado ^{a/}	Tipo de regulación ^{b/}	Area cuenca (km ²)	Caudal medio (m ³ /s)	Volumen vaso c/ ^{c/} (m ³ x 10 ⁶)	Potencia instalada (MW)	Energía anual (GWh)	Periodo de caudales ajustados
1	La Estrella	Caldera-Chiriquí	C	D	137	10.5	0.15	38	231	1956-1976
2	Los Valles	Los Valles-Chiriquí	C	D	60	5.5	0.01	42	247	1956-1976
3	Fortuna	Chiriquí-Chiriquí	EF	M	155	26.0	167	255	1 370	1956-1976
4	Tabasará	Tabasará-Tabasará	EE	A	1 050	90.0	1 150	112	705	1956-1976
5	Bayano	Bayano-Bayano	O	A	3 600	170.0	2 800	150	660	1956-1976
6	Teribe I	Teribe-Changuinola	EP	M	860	66.0	222	296	1 600	1955-1976
7	Teribe II	Teribe-Changuinola	EP	M	380	29.3	109	165	1 500	1955-1976
8	Changuiriola	Changuinola-Changuinola	EP	M	1 400	-	315	548	1 735	1955-1976
9	Coclé del Norte	Coclé-Coclé del Norte	EE	A	-	122.6	950	37	350	1959-1970

a/ O = Operación, C = Construcción, EF = Proyecto con estudios de factibilidad, EP = Proyecto con estudios de prefactibilidad, EE = Proyecto con estudios de evaluación.

b/ A = Anual, E = Estacional, M = Mensual, S = Semanal, D = Diaria, H = Horaria.

c/ Volumen útil.

(EN M3/S)

JUL AGO SEP OCT NOV DIC ANUAL

9.0	8.4	10.4	20.9	15.3	24.2	13.4
8.5	7.0	10.1	14.4	13.3	18.9	9.8
8.3	9.5	10.3	11.8	12.5	8.4	9.8
7.3	4.2	9.4	16.3	13.4	14.9	8.9
8.9	9.9	10.4	16.4	15.7	21.7	11.4
7.6	8.2	12.8	12.6	16.1	10.4	9.0
8.1	9.3	12.8	15.1	13.8	14.3	11.0
7.0	5.4	9.1	13.1	15.9	13.5	9.7
8.3	11.7	9.4	16.9	10.8	8.0	7.7
6.1	6.0	10.0	14.8	12.2	10.2	9.2
9.9	10.0	10.6	20.9	18.0	23.7	13.0
9.6	18.5	17.9	18.8	15.8	12.3	12.8
13.0	11.1	16.2	18.7	13.3	15.2	12.8
5.5	12.9	1.5	18.0	15.3	15.3	10.4
12.8	19.2	17.5	19.2	28.5	42.0	19.6
9.7	11.2	19.9	20.0	16.2	12.9	13.1
6.7	8.7	10.3	11.5	12.2	11.9	8.8
15.6	18.4	16.3	22.5	18.5	16.8	13.1
10.7	13.6	12.7	14.8	9.5	13.6	11.7
14.0	11.9	23.0	12.3	22.2	30.4	14.0
22.6	14.0	14.8	11.5	15.2	15.2	12.8

CCE/SC.5/GRIE/V/13
Pag. 171

PAIS PANAMA
 PLANTA HIDROELECTRICA LA ESTRELLA
 CUENCA DEL RIO CHIRIQUI
 CANTON DE MEDICIS MENSUALES DEL REGISTRO HISTORICO

ANO	ENE	FEB	MAR	ABR	MAY	JUN
1956	22.2	9.3	10.9	8.1	7.9	14.7
1957	13.0	7.9	4.3	2.8	6.3	9.4
1958	13.8	13.2	6.5	4.1	7.3	11.4
1959	7.3	6.9	4.9	6.0	5.4	10.4
1960	13.1	10.3	7.9	6.0	6.5	9.4
1961	12.1	5.7	6.5	4.6	5.4	6.1
1962	16.3	9.6	6.9	7.6	5.4	6.1
1963	10.2	9.6	7.3	13.0	6.7	7.2
1964	7.6	3.6	4.0	3.6	3.9	5.0
1965	17.8	9.4	7.7	3.7	7.2	5.0
1966	10.1	11.0	5.8	7.0	11.3	16.5
1967	15.4	7.8	5.9	10.2	5.5	15.9
1968	9.4	12.4	9.7	8.7	10.8	15.0
1969	6.8	7.2	4.3	5.8	5.8	10.7
1970	18.7	17.5	7.2	33.7	7.4	21.2
1971	19.7	10.6	11.0	9.6	7.5	9.2
1972	9.4	6.2	4.5	3.3	6.3	8.3
1973	11.0	8.7	4.4	5.9	7.9	11.5
1974	18.5	9.9	7.0	10.3	10.7	9.5
1975	13.6	9.9	6.2	7.8	6.2	12.3
1976	15.2	9.5	9.9	5.8	11.9	8.6

CIADRO 146

PAIS PANAMA
 PLANTA HIDROELECTRICA LOS VALLES
 CUENCA DE STO. CRISTOBAL
 CAUDALES MEDIOS MENSUALES DEL REGISTRO HISTORICO (EN M3/S)

CCE/SC.5/CITE/V.3
 PAG. 172

ANO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1956	8.1	2.1	3.3	2.6	3.2	10.3	4.3	3.6	5.7	16.8	9.2	9.3	6.6
1957	3.5	1.5	1.3	0.7	2.3	4.6	3.7	2.6	5.4	10.0	5.3	7.3	4.1
1958	3.3	3.6	2.0	1.1	2.0	6.3	3.5	4.8	5.6	7.2	3.5	3.3	4.0
1959	1.3	1.1	1.3	1.3	2.0	5.7	2.4	4.4	4.6	12.0	5.3	5.7	4.0
1960	3.5	2.5	2.5	1.7	2.7	4.6	4.1	5.2	5.7	12.1	10.0	8.3	5.2
1961	3.1	0.7	2.0	1.2	2.7	2.3	2.7	3.4	8.3	8.0	10.9	4.1	4.1
1962	4.8	2.2	2.1	2.4	2.6	6.7	3.3	4.6	3.2	10.7	6.1	5.6	5.0
1963	2.4	1.3	2.3	4.6	2.1	2.3	3.5	2.6	5.6	11.0	10.6	5.2	4.5
1964	2.2	0.4	1.1	0.0	2.1	4.7	6.8	8.8	7.2	14.2	5.7	3.2	4.7
1965	5.2	3.2	2.7	0.6	2.1	2.1	2.1	1.9	5.7	8.8	4.2	4.4	3.6
1966	2.5	2.3	2.2	2.7	3.2	14.4	6.1	5.2	9.2	20.5	10.3	10.5	7.4
1967	5.7	1.3	2.2	4.2	2.2	5.7	2.5	6.6	9.3	10.6	5.6	2.5	4.9
1968	2.3	6.0	3.5	2.6	3.5	4.3	3.4	4.5	10.8	14.6	6.8	6.1	6.1
1969	0.6	0.7	0.3	1.6	2.1	2.3	2.3	15.3	14.3	12.4	10.0	5.9	5.8
1970	5.6	5.2	2.2	13.0	3.1	6.5	9.1	5.5	13.3	14.7	10.8	14.4	8.6
1971	5.5	2.5	2.3	2.6	2.4	3.3	4.7	4.3	13.3	14.5	9.6	4.3	5.9
1972	2.4	1.0	1.5	2.2	2.5	4.3	2.8	4.8	4.6	6.3	4.9	4.3	3.5
1973	2.2	2.0	1.2	1.6	3.7	5.7	11.9	15.0	15.3	24.2	15.9	6.0	8.7
1974	3.6	4.5	3.1	4.7	4.9	4.3	4.9	6.2	5.8	6.8	4.3	6.2	5.4
1975	6.2	4.5	2.7	3.5	2.7	4.7	6.4	5.4	10.7	5.6	10.3	14.2	6.4
1976	7.0	4.3	4.5	2.5	5.4	2.0	10.5	6.4	6.8	5.2	7.0	7.0	5.9

CIADRO 147

PAIS PANAMA
 PLANTA HIDROELECTRICA FORTUNA
 CUENCA DEL RIO CHIRIQUI
 CAUDALES MEDIOS MENSUALES DEL REGISTRO HISTORICO (EN M3/S)

ANO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1956	45.0	23.0	25.0	21.0	20.0	32.0	22.0	21.0	25.0	43.0	33.0	48.0	29.8
1957	39.0	20.0	15.0	13.0	19.0	23.0	21.0	19.0	24.0	32.0	30.0	39.0	23.6
1958	31.0	29.0	13.0	14.0	10.0	25.0	21.0	23.0	24.0	27.0	28.0	21.0	23.4
1959	19.0	18.0	15.0	17.0	16.0	25.0	19.0	14.0	23.0	35.0	30.0	32.0	21.9
1960	29.0	24.0	20.0	17.0	13.0	23.0	22.0	24.0	25.0	35.0	34.0	44.0	26.3
1961	36.0	13.0	19.0	8.0	10.0	13.0	10.0	19.0	24.0	17.0	28.0	43.0	20.0
1962	42.0	27.0	19.0	18.0	16.0	18.0	22.0	22.0	24.0	21.0	25.0	45.0	24.9
1963	25.0	26.0	23.0	38.0	20.0	18.0	15.0	12.0	16.0	18.0	41.0	45.0	25.2
1964	23.0	9.0	23.0	3.0	20.0	19.0	35.0	37.0	19.0	26.0	37.0	30.0	24.2
1965	44.0	33.0	31.0	6.0	17.0	11.0	20.0	13.0	17.0	18.0	20.0	28.0	21.5
1966	27.0	27.0	19.0	23.0	27.0	24.0	16.0	19.0	20.0	25.0	26.0	40.0	25.7
1967	36.0	21.0	32.0	33.0	22.0	27.0	22.0	40.0	24.0	20.0	24.0	29.0	26.7
1968	29.0	44.0	21.0	25.0	20.0	23.0	23.0	21.0	27.0	26.0	26.0	23.0	25.7
1969	12.0	13.0	12.0	11.0	19.0	18.0	19.0	27.0	28.0	24.0	30.0	27.0	20.0
1970	59.0	54.0	17.0	67.0	24.0	17.0	27.0	22.0	39.0	32.0	47.0	91.0	40.8
1971	34.0	14.0	23.0	18.0	12.0	20.0	40.0	16.0	39.0	25.0	31.0	33.0	25.8
1972	23.0	24.0	12.0	25.0	15.0	24.0	22.0	24.0	27.0	24.0	22.0	33.0	22.9
1973	31.0	26.0	1.0	13.0	27.0	26.0	24.0	44.0	24.0	44.0	57.0	47.0	31.8
1974	42.0	21.0	14.0	22.0	23.0	20.0	23.0	30.0	28.0	33.0	20.0	30.0	25.5
1975	39.0	21.0	12.0	16.0	12.0	22.0	31.0	26.0	53.0	27.0	51.0	71.0	31.0
1976	34.0	22.0	21.0	11.0	26.0	18.0	52.0	31.0	33.0	25.0	34.0	34.0	28.3

PAIS PANAMA
 PLANTA HIDROELECTRICA TABASARA
 CUERCA DE RIO TABASARA

CANTIDADES MEDIDAS MENSUALES DEL REGISTRO HISTORICO (EN M3/S)

ANO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1956	90.0	28.0	31.0	22.0	41.0	95.0	97.0	102.0	132.0	251.0	198.0	88.0	97.9
1957	40.0	30.0	12.0	10.0	17.0	57.0	79.0	63.0	110.0	182.0	114.0	81.0	67.1
1958	47.0	36.0	15.0	10.0	42.0	73.0	76.0	139.0	143.0	150.0	98.0	47.0	71.8
1959	21.0	18.0	11.0	14.0	13.0	120.0	67.0	98.0	102.0	230.0	115.0	60.0	72.4
1960	39.0	28.0	13.0	13.0	40.0	103.0	94.0	105.0	120.0	237.0	197.0	90.0	90.3
1961	34.0	13.0	11.0	10.0	12.0	29.0	70.0	82.0	150.0	128.0	220.0	60.0	68.3
1962	49.0	21.0	11.0	15.0	22.0	103.0	70.0	124.0	136.0	158.0	117.0	57.0	73.6
1963	30.0	26.0	15.0	47.0	25.0	102.0	84.0	93.0	135.0	210.0	200.0	62.0	85.8
1964	33.0	13.0	12.0	10.0	22.0	86.0	130.0	170.0	138.0	278.0	116.0	37.0	87.1
1965	57.0	35.0	10.0	3.0	26.0	41.0	36.0	81.0	121.0	180.0	129.0	78.0	67.6
1966	47.0	33.0	23.0	30.0	63.0	146.0	141.0	151.0	174.0	142.0	297.0	86.0	111.1
1967	40.0	30.0	29.0	31.0	27.0	39.0	90.0	134.0	122.0	232.0	117.0	61.0	85.1
1968	31.0	46.0	33.0	35.0	60.0	141.0	116.0	115.0	212.0	227.0	111.0	81.0	101.1
1969	31.0	26.0	15.0	17.0	37.0	120.0	72.0	161.0	248.0	216.0	233.0	101.0	106.6
1970	73.0	43.0	23.0	32.0	67.0	32.0	118.0	213.0	249.0	236.0	228.0	127.0	129.3
1971	50.0	29.0	31.0	22.0	41.0	51.0	100.0	181.0	249.0	220.0	144.0	61.0	99.8
1972	30.0	26.0	19.0	23.0	38.0	60.0	39.0	84.0	149.0	163.0	120.0	57.0	68.0
1973	44.0	32.0	12.0	12.0	49.0	131.0	185.0	279.0	266.0	334.0	219.0	111.0	139.5
1974	46.0	27.0	15.0	10.0	32.0	109.0	78.0	97.0	237.0	301.0	114.0	42.0	93.1
1975	37.0	23.0	12.0	12.0	26.0	72.0	117.0	142.0	224.0	201.0	392.0	105.0	113.5
1976	42.0	29.0	13.0	11.0	26.0	56.0	44.0	78.0	87.0	170.0	104.0	43.0	59.9

CUADRO 149

PAIS PANAMA
 PLANTA HIDROELECTRICA DAYANO
 CUENCA DEL RIO DAYANO
 CALDALES MEDIOS MENSUALES DEL REGISTRO HISTORICO (EN M3/S)

ANO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1959	37.4	17.5	13.5	23.0	162.0	155.0	112.0	156.0	166.0	360.0	253.0	290.0	145.9
1960	107.0	34.2	21.3	63.5	196.0	152.0	199.0	213.0	181.0	336.0	272.0	582.0	203.7
1961	51.5	26.2	12.1	25.0	60.2	115.0	185.0	212.0	172.0	338.0	427.0	120.0	145.3
1962	53.3	23.5	14.0	45.1	172.0	155.0	319.0	273.0	188.0	283.0	304.0	133.0	165.2
1963	200.0	49.0	37.0	73.1	173.0	172.0	178.0	121.0	255.0	214.0	388.0	93.0	170.2
1964	30.5	18.2	12.4	46.7	69.2	331.0	173.0	217.0	215.0	275.0	290.0	123.0	141.8
1965	60.9	33.1	27.2	15.2	92.4	141.0	82.0	205.0	292.0	278.0	426.0	268.0	160.3
1966	76.6	39.4	27.3	68.7	186.0	173.0	225.0	202.0	224.0	207.0	510.0	441.0	197.7
1967	75.1	44.6	27.5	92.3	196.0	413.0	349.0	245.0	221.0	276.0	389.0	192.0	210.1
1968	47.0	44.2	46.9	57.4	175.0	225.0	180.0	376.0	376.0	434.0	259.0	107.0	194.0
1969	51.7	34.2	24.4	76.9	193.0	173.0	97.9	159.0	248.0	368.0	528.0	573.0	204.7
1970	290.0	78.2	63.5	270.0	288.0	328.0	164.0	268.0	298.0	502.0	319.0	392.0	263.5
1971	154.0	48.4	60.4	31.2	239.0	220.0	329.0	261.0	219.0	220.0	263.0	78.8	177.7
1972	19.1	45.1	23.0	92.1	142.0	174.0	99.0	94.2	142.0	178.0	162.0	79.0	103.3
1973	29.2	16.7	10.4	20.0	94.0	170.0	213.0	237.0	195.0	406.0	618.0	221.0	186.7
1974	29.0	30.3	22.0	31.3	75.6	176.0	219.0	235.0	226.0	402.0	320.0	125.0	162.6
1975	28.7	20.2	16.2	14.0	94.8	258.0	333.0	311.0	223.0	384.0	796.0	300.0	231.7
1976	33.2	39.4	32.0	70.4	93.5	34.6	56.8	46.7	108.0	312.0	116.0	63.9	93.1

CUADRO 150

PAIS PANAMA
 PLANTA HIDROELECTRICA LA ESTRELLA
 CIENCA DE RICO CHIRIQUI
 CAUDALES MEDICOS MENSUALES DEL REGISTRO SINTEICO (EN M3/S)

ANO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1	14.6	9.7	5.8	25.8	8.1	7.2	6.0	8.2	9.0	19.2	15.8	12.6	11.7
2	10.2	7.8	7.8	4.8	5.9	15.1	12.7	11.3	10.7	19.0	11.2	8.1	10.4
3	11.7	7.4	7.7	9.2	6.3	16.6	7.2	6.2	9.3	12.8	21.9	25.9	11.8
4	8.3	6.9	4.0	1.6	8.5	10.0	10.4	9.6	10.9	16.8	13.9	10.7	9.4
5	7.4	6.6	4.6	1.7	6.6	12.9	9.1	9.4	9.1	13.5	10.4	8.9	8.3
6	9.1	8.2	5.5	5.5	10.3	10.3	10.6	5.2	8.9	16.7	13.7	14.8	10.0
7	10.9	5.4	5.6	9.4	6.3	9.0	8.2	9.4	12.5	11.9	16.9	22.1	10.6
8	12.0	14.2	7.7	6.0	7.5	7.2	8.3	7.1	10.7	14.8	14.7	22.0	11.0
9	1.7	13.6	7.2	23.9	5.9	9.3	12.3	9.9	11.3	13.2	12.9	14.5	12.1
10	12.0	8.2	7.3	3.2	7.1	5.2	8.1	14.6	14.3	12.4	13.0	7.9	9.4
11	13.2	9.8	10.1	9.0	6.2	9.8	11.7	7.6	9.9	14.8	12.3	18.9	11.1
12	8.4	14.3	7.7	6.7	3.9	6.0	5.6	9.2	9.4	19.2	17.5	19.9	10.6
13	15.5	5.4	5.7	10.7	8.1	12.4	13.3	8.4	11.7	14.1	12.8	15.5	11.1
14	12.3	4.8	6.6	12.3	10.5	15.1	11.4	10.1	16.1	17.2	13.7	11.5	11.8
15	7.4	7.0	3.9	11.5	5.9	4.1	8.3	17.2	20.2	11.6	12.4	10.8	10.0
16	16.0	8.8	7.0	3.4	10.8	11.1	12.9	16.8	19.0	18.6	14.5	16.0	13.3
17	14.1	7.0	3.5	4.8	4.2	10.6	6.8	6.5	10.2	12.5	13.4	17.5	9.7
18	14.5	11.8	12.4	8.6	5.7	12.0	8.0	10.8	9.6	10.0	9.0	5.8	9.8
19	14.6	13.0	7.5	7.4	11.7	20.5	11.4	10.1	12.9	12.8	28.1	36.4	15.5
20	14.2	6.0	6.6	6.6	13.2	10.3	9.8	9.0	14.1	8.1	10.6	14.6	10.3
21	7.0	5.2	6.5	17.2	7.9	14.7	9.9	9.1	10.2	15.6	9.3	6.9	10.0
22	11.0	11.8	3.2	6.6	8.0	9.9	9.6	6.9	8.0	16.3	17.1	20.7	11.2
23	11.7	8.8	4.6	3.4	5.3	12.7	10.7	7.8	11.5	22.8	16.4	11.7	10.6
24	14.4	9.5	5.5	11.0	9.1	15.2	7.2	10.1	11.9	13.8	11.7	12.1	11.0
25	5.4	5.8	3.1	10.3	6.2	10.7	12.3	17.1	16.2	20.7	21.7	18.6	12.4
26	12.0	7.4	10.2	3.1	7.5	9.0	10.6	9.5	15.5	20.2	11.0	6.9	10.7
27	8.1	9.0	5.6	9.5	9.3	12.7	9.4	16.8	25.1	19.6	13.7	21.9	13.4
28	18.9	13.3	9.0	12.1	8.0	9.2	6.6	7.4	10.2	18.8	17.2	16.1	12.2
29	12.1	8.4	5.0	4.4	11.8	15.3	7.0	7.2	12.1	11.2	16.6	20.9	11.0
30	11.2	7.9	3.6	2.5	10.0	7.0	9.5	6.8	12.2	24.4	15.7	10.0	10.1

CUADRO 151

PAIS PANAMA
 PLANTA HIDROELECTRICA LOS VALLES
 CUENCA DEL RTO CHIRIQUÍ
 CAUDALES MEDIOS MENSUALES DEL REGISTRO SINTETICO (EN M3/S)

ANO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1	6.7	3.9	2.5	12.0	3.5	3.7	2.6	3.7	4.1	8.9	7.3	5.8	5.4
2	4.6	3.5	3.5	2.1	2.6	6.9	5.8	5.1	4.9	8.8	5.1	3.6	4.7
3	5.3	3.3	3.4	4.2	2.8	7.7	3.2	2.7	4.2	5.9	10.2	12.1	5.4
4	3.7	3.1	2.1	0.5	3.3	4.5	4.7	4.3	5.0	7.9	6.4	4.9	4.2
5	3.3	2.9	2.0	0.6	2.9	5.9	4.1	4.2	4.1	6.2	4.7	4.0	3.7
6	4.1	3.7	2.4	2.7	4.8	4.7	4.8	2.3	4.0	7.7	6.3	6.8	4.5
7	5.0	2.4	2.4	4.2	2.3	4.1	3.7	4.2	5.7	5.4	7.8	10.3	4.8
8	5.5	6.5	3.4	2.6	3.3	3.2	3.7	3.2	4.9	6.8	6.8	10.2	5.0
9	4.9	6.2	3.2	11.1	2.6	4.2	5.6	4.5	5.1	6.0	5.9	6.7	5.5
10	5.5	3.7	3.3	1.3	3.2	2.3	3.6	6.7	6.6	5.7	6.0	3.5	4.3
11	6.0	4.4	4.6	4.1	2.7	4.4	5.3	3.4	4.5	6.8	5.6	8.8	5.0
12	3.9	6.6	3.4	3.0	1.5	2.5	2.4	4.2	4.2	8.9	8.1	9.2	4.8
13	7.1	2.4	2.5	4.9	3.6	5.7	6.1	3.8	5.3	6.5	5.9	7.1	5.1
14	5.6	2.1	2.9	5.6	4.8	6.9	5.2	4.6	7.4	7.9	6.3	5.2	5.4
15	3.3	3.1	1.6	5.2	2.5	1.7	3.7	7.9	9.4	5.3	5.7	4.9	4.5
16	7.4	4.0	3.1	3.3	4.9	5.1	5.9	7.8	8.8	8.6	6.7	7.4	6.1
17	6.5	3.1	3.3	2.1	1.8	4.3	3.0	2.9	4.6	5.7	6.1	8.1	4.4
18	6.7	5.4	5.7	3.0	2.5	5.5	3.6	4.9	4.3	4.5	4.1	7.5	4.5
19	6.7	6.0	3.3	3.3	5.3	9.5	5.2	4.6	5.9	5.9	13.1	17.0	7.1
20	6.5	2.6	2.0	2.9	6.0	4.0	4.4	4.1	6.5	3.6	4.8	6.7	4.7
21	3.5	2.3	2.0	7.0	3.5	6.3	4.5	4.1	4.6	7.2	4.2	3.1	4.5
22	5.4	5.4	3.7	2.9	3.6	4.5	4.3	3.1	3.6	7.5	7.9	9.6	5.1
23	5.3	4.0	2.0	1.4	2.3	5.3	4.9	3.5	5.2	10.6	7.6	5.3	4.8
24	6.6	4.3	2.4	5.0	4.1	7.0	3.2	4.6	5.4	6.3	5.3	5.5	5.0
25	2.4	2.5	1.3	4.9	2.7	4.9	5.6	7.9	7.5	9.6	10.1	8.6	5.7
26	5.5	3.2	4.6	3.6	3.3	4.1	4.8	4.2	7.1	9.4	5.0	3.1	4.8
27	3.6	4.1	2.4	4.3	4.2	5.3	4.2	7.8	11.7	9.1	6.3	10.2	6.1
28	8.8	6.1	4.1	5.5	3.6	4.2	2.9	3.3	4.6	8.7	7.9	7.4	5.6
29	5.5	3.8	2.2	1.9	5.4	7.0	3.1	3.2	5.5	5.1	7.7	9.7	5.0
30	5.1	3.5	1.5	1.0	4.5	3.1	4.3	3.0	5.6	11.4	7.2	4.5	4.6

CCE/SC.5/GRIB/V/3
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CUADRO 1

PAIS PANAMA

PLANTA HIDROELECTRICA FORTUNA

CUENCA DEL RIO CHIRIQUI

CAUDALES MEDIOS MENSUALES DEL REGISTRO SINTETICO

ANO	ENE	FEB	MAR	ABR	MAY	JUN
1	35.5	22.5	16.7	57.8	24.1	17.7
2	25.7	19.9	23.8	11.6	15.3	28.6
3	30.6	13.6	23.3	23.3	17.3	31.0
4	15.5	13.8	15.4	3.3	20.5	20.7
5	19.1	15.5	14.6	4.9	16.6	25.5
6	24.2	22.1	16.3	19.2	25.3	21.3
7	26.7	9.9	19.2	25.7	17.6	20.3
8	27.3	42.2	13.3	14.4	19.2	16.7
9	25.2	40.6	17.0	53.1	18.2	21.4
10	29.6	21.2	22.1	6.3	17.7	12.7
11	24.0	28.0	23.4	21.1	16.7	21.3
12	26.7	43.4	19.1	16.1	9.5	14.5
13	36.4	8.6	19.2	23.6	21.3	25.4
14	30.4	7.4	22.5	31.3	26.5	29.2
15	13.7	16.9	11.5	30.7	16.3	11.3
16	40.0	23.5	27.8	21.7	26.2	22.3
17	24.3	15.7	26.2	10.3	10.4	21.9
18	35.4	34.4	32.4	17.8	15.2	24.4
19	38.2	40.0	13.7	13.3	27.2	35.6
20	26.1	7.9	21.3	18.2	29.4	20.3
21	20.5	9.9	22.1	41.7	22.5	29.2
22	31.1	35.6	22.1	16.7	20.5	21.2
23	26.3	22.5	12.0	10.2	13.5	25.3
24	26.7	26.4	15.1	23.6	23.3	29.5
25	13.9	12.3	7.1	27.3	17.7	23.1
26	27.9	17.2	30.0	18.3	19.6	19.9
27	21.7	25.0	15.3	25.5	24.3	25.6
28	45.3	30.6	23.1	23.7	21.7	20.5
29	29.2	21.6	14.4	12.3	26.9	28.4
30	25.5	19.2	3.5	8.3	23.5	15.0

(EN M3/S)

JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
15.4	19.7	19.4	35.3	36.0	31.4	27.6
30.1	23.7	19.2	33.8	20.3	20.7	22.7
14.2	12.9	22.1	21.1	45.1	48.1	25.7
26.5	21.4	21.9	28.4	29.3	26.4	20.3
21.8	20.8	18.1	22.0	17.9	23.8	18.4
26.9	10.8	22.4	29.1	29.2	36.9	23.6
21.0	21.8	25.9	19.1	35.2	49.4	24.3
22.2	16.7	24.5	24.5	30.9	58.0	26.2
31.5	21.5	22.2	21.1	25.9	36.4	27.8
22.6	33.7	23.6	19.1	25.7	20.0	21.2
29.8	16.4	21.8	24.6	24.3	54.6	26.7
14.9	22.2	19.1	35.1	40.1	45.5	24.9
32.8	17.2	24.9	22.8	25.5	40.0	25.3
27.0	21.3	34.1	28.3	28.1	27.7	26.2
23.6	39.4	34.7	17.4	24.0	26.3	22.7
32.2	36.3	32.0	30.0	29.9	37.8	29.4
16.3	15.0	24.1	20.5	27.4	45.3	22.3
19.3	24.3	17.6	16.3	14.1	17.4	22.4
24.4	20.4	25.7	20.2	54.4	58.7	31.8
24.5	20.0	30.5	14.2	20.3	44.0	23.1
23.2	19.7	20.6	25.9	12.2	16.5	22.0
24.6	15.3	18.5	28.3	37.5	47.0	26.5
26.2	16.7	25.4	46.1	40.3	32.8	24.8
14.9	22.2	23.4	22.2	22.1	31.3	24.7
30.9	37.1	24.9	36.3	48.4	38.6	26.8
27.4	21.4	33.2	36.1	18.1	16.5	23.8
22.8	36.8	48.9	31.3	27.2	60.8	30.4
16.5	17.3	23.0	34.0	39.1	36.8	28.8
14.1	15.4	27.7	18.2	34.5	46.8	24.2
25.5	15.6	28.6	52.2	40.4	31.8	24.5

CUADRO 153

PAIS PANAMA
 PLANTA HIDROELECTRICA TABASARA
 CUENCA DEL RIO TABASARA
 CAUDALES MEDIDOS MENSUALES DEL REGISTRO SINTETICO (EN M3/S)

ANO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1	42.2	25.0	14.1	61.7	58.2	80.0	52.5	83.8	93.6	237.1	159.2	51.8	79.9
2	32.7	24.9	21.6	14.0	22.3	128.5	133.6	169.2	154.5	253.4	57.5	41.1	87.8
3	37.5	22.8	20.4	25.3	30.5	145.0	83.5	90.5	125.5	157.5	320.9	98.3	96.5
4	21.2	23.5	12.4	21.7	32.5	80.9	94.1	119.7	140.2	214.5	138.3	51.5	80.0
5	26.7	22.7	11.1	21.7	21.1	105.5	92.5	123.6	111.1	161.1	86.2	56.5	70.0
6	33.1	27.3	15.1	15.8	40.5	89.6	101.1	71.9	114.2	208.2	134.3	68.2	77.4
7	26.7	16.4	12.1	20.5	28.1	79.2	74.5	108.4	157.0	150.3	235.0	98.8	84.7
8	41.0	42.8	25.0	20.0	36.6	62.0	69.3	77.1	127.6	181.9	169.7	103.2	79.9
9	30.7	41.9	23.5	64.4	44.3	100.7	121.7	142.4	160.5	171.7	145.2	75.2	94.3
10	41.0	26.1	21.3	3.3	28.3	34.6	53.8	128.9	150.5	149.6	153.7	50.4	70.5
11	43.3	30.4	20.0	30.5	32.4	01.4	110.8	108.2	134.7	187.1	118.3	97.2	84.6
12	34.6	44.3	25.0	23.4	8.9	43.7	28.0	67.2	76.2	228.7	194.9	75.8	71.0
13	48.2	12.8	10.1	21.0	40.0	112.5	131.9	130.0	171.1	86.5	134.8	78.9	89.9
14	42.4	13.3	14.0	23.6	55.5	139.7	131.2	160.7	238.3	245.8	128.5	53.9	104.3
15	26.8	23.9	0.1	25.2	26.6	27.6	53.3	146.6	221.9	153.2	147.5	63.2	77.1
16	53.4	26.2	13.3	22.4	54.3	00.6	122.8	203.6	255.4	264.5	134.7	68.3	110.3
17	45.2	20.1	21.9	13.2	8.2	34.5	58.1	67.4	119.0	148.2	160.7	89.1	69.6
18	40.7	36.0	31.2	34.0	30.5	111.9	87.1	136.7	111.7	114.1	84.2	52.6	73.9
19	50.2	30.2	23.7	23.5	53.7	179.5	146.2	179.0	211.8	182.5	427.4	122.2	137.0
20	44.4	16.3	14.5	14.3	50.6	88.2	92.4	114.7	186.9	110.1	135.2	92.6	80.8
21	34.6	19.8	15.7	43.1	40.0	142.4	120.2	147.7	153.6	204.7	39.8	45.0	84.6
22	30.5	36.4	25.5	22.2	40.7	01.1	94.3	94.1	97.6	198.7	206.6	85.3	86.0
23	38.0	27.7	11.5	5.3	13.7	103.1	106.4	111.6	159.9	313.0	142.4	41.9	89.6
24	43.4	23.0	14.2	26.6	47.9	145.0	84.0	131.5	159.7	178.3	112.8	66.7	86.1
25	25.0	21.7	6.1	21.6	27.3	05.5	116.3	201.2	213.6	287.6	262.3	62.0	111.7
26	36.2	22.4	23.1	26.1	39.2	33.5	99.1	123.6	205.6	279.1	38.3	33.8	84.6
27	26.7	29.3	15.6	24.3	48.1	116.0	103.4	196.5	313.2	286.0	109.0	98.9	114.0
28	62.5	33.7	27.3	37.8	47.9	01.2	63.6	84.2	123.5	239.8	191.0	62.4	89.2
29	30.0	25.9	12.5	3.4	51.4	130.5	74.2	92.3	158.2	142.0	233.5	95.7	88.5
30	39.8	25.7	7.3	0.6	39.9	46.8	70.7	66.7	142.5	330.5	115.9	34.2	76.8

CUADRO 154

PAIS PANAMA
 PLANTA HIDROELECTRICA BAYANO
 CUENCA DEL RIO BAYANO
 CAUDALES MEDIDOS MENSUALES DEL REGISTRO SINTECO (EN M3/S)

ANO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1	83.2	31.2	17.5	163.5	232.1	142.6	88.7	145.4	140.2	371.3	377.6	89.9	156.9
2	12.6	24.7	23.6	18.4	88.2	318.2	348.0	274.7	200.1	390.4	123.4	64.7	157.2
3	52.7	25.5	24.3	73.3	135.0	397.3	266.6	198.9	198.0	246.2	644.4	265.4	209.9
4	64.2	21.6	7.6	61.9	138.5	151.2	188.9	180.8	179.6	325.3	309.3	89.0	145.7
5	64.2	21.6	6.5	61.9	95.2	230.0	214.7	204.3	155.1	240.4	138.3	138.2	133.4
6	18.6	23.7	14.7	37.5	202.7	157.9	197.8	117.6	159.9	321.9	297.9	209.3	147.2
7	40.5	14.8	7.0	52.2	119.5	150.3	145.9	175.7	206.3	213.9	468.5	349.0	162.0
8	61.7	52.5	37.7	63.4	158.4	124.0	136.1	131.0	177.6	277.4	359.3	488.7	172.3
9	72.0	53.3	36.9	187.6	194.4	195.2	251.2	201.5	193.2	243.8	289.4	244.4	179.4
10	67.0	30.9	25.7	61.9	104.4	95.9	110.1	248.9	218.1	223.8	299.4	58.4	127.9
11	33.2	38.2	45.9	97.8	151.2	176.8	232.9	163.0	174.4	279.7	240.1	499.7	182.0
12	54.0	55.3	47.0	75.3	57.9	106.2	55.3	148.2	136.5	367.3	453.3	226.7	148.8
13	110.2	14.0	7.1	62.5	163.6	216.2	283.1	187.8	209.4	271.4	277.1	291.6	175.0
14	79.2	13.5	11.9	79.3	229.1	272.3	288.8	233.2	283.1	366.7	304.9	116.5	190.0
15	64.2	23.3	4.9	70.5	119.1	86.2	119.0	302.9	312.6	226.1	286.3	145.2	149.2
16	154.2	38.8	30.3	79.7	238.0	177.8	249.2	314.0	305.6	398.5	334.0	223.2	211.9
17	60.2	25.4	30.2	24.0	44.5	137.2	131.9	133.2	177.5	223.1	314.8	348.3	144.9
18	125.8	49.7	67.9	122.2	154.4	238.7	200.8	231.2	158.1	154.0	93.5	94.8	140.9
19	135.0	55.1	41.1	86.5	259.0	462.4	422.0	307.9	274.1	268.8	837.1	344.7	291.2
20	46.0	13.2	9.5	26.3	240.2	152.5	176.4	169.2	232.0	124.8	213.1	399.3	150.4
21	33.7	18.7	15.3	117.4	200.4	298.4	281.0	228.3	194.4	307.6	27.1	84.3	151.0
22	65.8	45.2	37.4	67.2	173.8	156.4	187.2	143.8	134.8	303.8	450.3	279.3	171.2
23	46.4	31.2	12.4	2.1	60.5	237.2	255.8	186.1	212.1	484.4	390.3	59.7	164.8
24	93.7	36.0	29.0	83.6	209.0	295.7	200.3	227.8	215.5	268.2	221.2	205.8	173.5
25	94.2	20.6	9.7	67.8	122.3	188.4	249.1	326.3	265.7	441.7	622.2	119.3	209.3
26	76.8	22.0	37.6	73.5	165.2	152.7	197.7	182.7	252.7	426.6	77.9	26.3	136.8
27	64.2	30.7	15.7	67.6	200.7	216.7	212.2	332.4	389.7	440.3	289.4	561.0	237.7
28	252.1	66.0	53.0	153.3	233.5	173.0	122.3	143.9	173.0	374.2	448.5	139.3	194.8
29	41.7	28.4	12.2	12.0	200.1	248.9	153.1	154.2	211.3	200.0	459.4	320.7	170.9
30	4.1	28.3	7.1	61.9	167.4	116.7	148.0	122.0	199.6	513.1	339.6	30.4	147.6

Cuadro 155

PANAMA: CUENCAS DE LOS RIOS CHIRIQUI, TABASARA Y BAYANO. COMPARACION DE REGISTROS HISTORICOS Y GENERACION

Proyecto	Caudales medios mensuales (m ³ /s)												
	Ene.	Feb.	Marzo	Abril	Mayo	Junio	Jul.	Agosto	Sept.	Oct.	Nov.	Dic.	Anual
<u>La Estrella</u>													
Histórico	13.4	9.3	6.8	8.3	7.4	10.4	10.0	10.9	13.4	16.2	15.4	16.8	11.5
Sintético	11.7	8.7	6.7	8.8	7.9	11.1	9.5	9.8	12.4	15.8	14.6	15.3	11.0
<u>Los Valles</u>													
Histórico	4.1	2.5	2.3	2.8	2.9	5.3	5.0	5.8	8.4	11.7	7.9	6.6	5.4
Sintético	5.3	3.9	3.0	4.0	3.5	5.1	4.3	4.4	5.7	7.3	6.7	7.0	5.0
<u>Fortuna</u>													
Histórico	32.2	24.6	19.1	20.4	19.1	21.8	24.6	24.0	26.4	27.5	32.1	39.7	26.0
Sintético	28.4	22.7	19.3	21.9	20.2	22.7	23.4	21.8	25.2	27.1	30.1	36.9	25.0
<u>Tabasará</u>													
Histórico	44.4	28.1	18.6	21.7	34.6	91.2	90.6	128.2	166.9	211.7	170.2	73.1	89.9
Sintético	39.5	27.0	18.2	24.3	37.7	97.6	92.3	122.6	159.6	205.5	157.3	70.5	87.7
<u>Bayano</u>													
Histórico	94.2	36.1	27.0	61.9	150.1	186.4	195.2	212.9	219.4	320.7	368.9	232.3	175.4
Sintético	79.3	32.0	23.6	73.9	162.7	203.2	203.8	203.9	211.3	309.8	332.9	217.1	171.1

CUADRO 156

PAIS PANAMA
 PLANTA HIDROELECTRICA TERIBE I
 CIENCIA DEL RIO CHANGUINOLA
 CAMPAÑAS MEDICAS MENSUALES DEL REGISTRO HISTORICO (EN M3/S)

AÑO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1955	54.6	45.9	30.7	16.3	43.7	56.4	78.1	67.4	69.3	102.0	104.0	96.7	64.6
1956	95.7	62.2	46.4	48.6	103.2	85.6	123.0	89.1	98.8	110.0	56.9	84.1	84.4
1957	60.7	28.8	27.1	29.1	54.2	70.3	73.2	75.7	99.3	109.0	81.6	85.6	66.3
1958	56.0	57.9	29.1	24.6	86.6	90.6	77.6	80.1	57.9	65.5	56.0	41.9	60.3
1959	23.4	18.8	14.8	17.4	35.3	82.6	69.3	69.3	71.3	97.2	70.8	62.2	52.8
1960	57.4	42.3	35.5	37.0	46.8	72.7	84.6	63.1	70.3	110.0	75.7	80.1	64.6
1961	41.4	32.2	20.8	18.0	42.3	59.3	75.7	65.0	95.7	93.2	90.1	93.7	61.6
1962	32.8	28.5	19.5	26.5	57.4	78.1	89.1	73.7	92.7	106.0	158.0	102.0	73.7
1963	46.0	43.7	33.8	49.1	70.0	70.8	76.2	77.6	99.8	88.6	108.0	71.3	70.1
1964	64.0	23.2	13.6	15.2	40.6	75.7	105.0	93.2	103.0	98.8	78.6	45.5	63.0
1965	34.1	46.4	46.4	22.7	64.0	37.6	76.7	96.7	87.1	99.3	93.7	65.5	72.5
1966	73.7	31.1	42.3	38.8	87.1	95.2	83.1	92.2	90.1	98.8	89.6	126.0	83.2
1967	73.7	45.9	37.0	59.8	58.8	109.0	87.1	101.0	106.0	111.0	92.2	66.9	79.0
1968	42.3	66.4	56.5	55.6	75.2	102.0	106.0	99.3	132.0	96.2	96.7	83.1	84.3
1969	38.8	29.2	19.0	33.2	39.7	70.3	55.6	101.0	106.0	105.0	129.0	99.3	68.9
1970	76.6	112.0	41.0	163.0	95.7	103.0	104.0	83.1	102.0	102.0	132.0	246.0	114.1
1971	76.6	45.9	50.0	42.3	49.1	65.0	90.6	54.2	77.2	95.7	76.2	51.4	65.4
1972	76.7	35.0	31.3	57.4	65.5	76.2	67.4	90.6	92.2	137.0	95.7	95.2	76.7
1973	62.2	39.8	16.2	21.1	51.4	64.0	63.6	81.1	62.6	108.0	151.0	141.0	71.6
1974	117.0	30.7	32.5	37.9	64.7	100.0	88.3	98.8	62.2	107.0	69.1	91.6	75.7
1975	40.3	33.8	22.0	17.7	34.2	71.0	103.0	110.0	112.0	102.0	139.0	173.0	80.5
1976	67.0	46.2	35.1	23.1	59.3	83.5	129.0	86.6	70.2	76.4	120.0	63.1	71.6

CUADRO 157

PAIS PANAMA
 PLANTA HIDROELECTRICA TERIBE II
 CUENCA DEL RIO CHANGUINOLA
 CAUDALES MEDIOS MENSUALES DEL REGISTRO HISTORICO (EN M3/S)

ANO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1955	24.1	20.3	13.6	7.2	19.3	29.3	34.5	29.8	30.6	45.1	46.0	42.7	28.5
1956	42.3	27.5	20.5	21.5	45.5	37.3	54.3	39.4	43.7	48.6	29.6	37.2	37.3
1957	26.8	12.7	13.0	12.7	23.2	31.3	32.3	33.4	43.9	48.2	36.1	37.8	29.3
1958	24.7	25.6	12.9	10.9	38.3	40.0	34.3	35.4	25.6	28.9	24.7	18.5	26.6
1959	10.3	8.2	6.5	7.7	15.5	26.9	30.6	30.6	31.5	42.9	31.3	27.5	23.3
1960	25.4	13.7	15.7	15.3	20.7	32.1	37.4	27.9	31.1	48.6	33.4	35.4	28.6
1961	18.3	14.2	9.2	8.4	18.2	30.6	33.4	28.7	42.3	41.2	39.8	41.4	27.2
1962	23.3	12.6	3.6	11.7	25.4	24.5	39.4	32.6	41.0	46.8	69.8	45.1	32.6
1963	20.7	19.2	17.2	21.7	31.3	31.3	33.7	34.3	44.1	39.1	47.7	31.5	31.0
1964	28.3	10.3	6.0	6.7	17.9	33.4	46.4	41.2	45.5	43.7	34.7	20.1	27.8
1965	37.2	21.5	20.5	10.0	28.2	38.7	33.9	42.7	38.5	43.9	41.4	28.9	32.0
1966	32.6	35.8	13.7	17.1	38.5	42.1	36.7	40.7	39.8	43.7	39.6	55.7	36.7
1967	32.6	20.3	16.3	25.4	26.0	48.2	33.5	44.6	46.8	49.0	40.7	29.6	34.9
1968	13.7	22.3	25.0	24.6	33.2	45.1	46.8	43.9	58.3	42.5	42.7	36.7	37.2
1969	17.1	12.9	3.3	14.7	17.5	31.1	24.6	44.6	46.8	46.4	57.0	43.9	30.4
1970	37.4	49.5	13.5	72.0	42.3	45.5	46.0	36.7	45.1	45.1	58.3	108.7	50.4
1971	38.3	20.3	22.5	13.7	21.7	28.7	40.0	23.9	34.1	42.3	33.7	22.7	28.9
1972	33.9	15.5	13.8	25.4	28.2	33.7	29.8	40.0	40.7	60.5	42.3	42.1	33.9
1973	26.6	17.1	7.2	9.3	22.7	28.3	28.1	35.8	27.7	47.7	66.7	62.3	31.6
1974	51.7	17.5	14.4	15.7	28.5	44.2	39.0	43.7	27.5	47.3	30.5	40.5	33.5
1975	17.8	17.1	10.1	3.7	15.1	31.4	45.5	48.6	49.5	45.1	61.4	76.4	35.6
1976	29.6	20.4	15.5	10.2	26.2	26.9	57.0	38.3	31.0	33.8	53.0	27.9	31.6

CUADRO 158

ANO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1955	119.0	103.0	74.4	45.0	99.0	139.0	139.0	159.0	141.0	144.0	199.0	190.0	134.4
1956	138.0	132.0	104.0	108.0	200.0	172.0	232.0	159.0	177.0	193.0	211.0	140.0	168.8
1957	130.0	73.7	67.4	71.3	118.0	147.0	151.0	155.0	155.0	194.0	210.0	172.0	137.6
1958	121.0	125.0	71.3	62.3	173.0	190.0	158.0	158.0	162.0	125.0	138.0	95.7	127.7
1959	60.0	50.3	41.7	47.5	83.2	158.0	144.0	144.0	144.0	148.0	191.0	132.0	113.1
1960	124.0	96.6	33.7	36.6	105.2	150.2	170.3	134.0	146.0	210.0	155.0	162.0	135.2
1961	94.9	77.4	54.5	50.5	97.4	144.0	155.0	137.0	188.0	184.0	179.0	185.0	128.9
1962	115.0	70.2	51.3	66.1	124.0	159.0	177.0	152.0	183.0	205.0	284.0	199.0	148.9
1963	105.0	99.0	99.0	109.0	147.0	147.0	156.0	158.0	195.0	176.0	208.0	148.0	144.8
1964	135.0	59.4	39.1	42.6	93.2	155.0	204.0	184.0	260.0	193.0	160.0	102.0	130.6
1965	169.0	104.0	104.0	58.5	135.0	125.0	157.0	190.0	174.0	194.0	195.0	138.0	148.6
1966	150.0	154.0	76.6	90.0	174.0	187.0	168.0	182.0	179.0	193.0	178.0	235.0	166.5
1967	152.0	103.0	36.6	123.0	126.0	210.0	174.0	197.0	205.0	212.0	182.0	140.0	159.6
1968	96.0	139.0	122.0	120.0	154.0	198.0	205.0	194.0	245.0	189.0	190.0	168.0	168.4
1969	90.0	71.5	52.7	79.4	91.5	146.0	120.0	197.0	205.0	204.0	241.0	194.0	141.0
1970	170.0	214.0	75.7	202.0	188.0	200.0	201.0	168.0	198.0	198.0	245.0	411.0	215.1
1971	173.0	103.0	112.0	76.6	109.0	137.0	180.0	118.0	158.0	188.0	156.0	113.0	137.0
1972	157.0	82.7	75.7	124.0	138.0	156.0	141.0	180.0	182.0	253.0	188.0	187.0	155.4
1973	129.0	90.0	44.7	55.2	113.0	135.0	134.0	164.0	132.0	208.0	274.0	258.0	144.7
1974	228.0	91.6	77.9	39.3	122.0	186.0	166.0	183.0	129.0	239.0	131.0	129.0	147.1
1975	97.2	90.7	51.9	63.6	101.0	156.0	182.0	187.0	235.0	194.0	255.0	319.0	161.9
1976	132.0	107.0	76.1	57.2	132.0	180.0	223.0	166.0	170.0	163.0	197.0	149.0	145.1

ANO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1959	68.0	31.0	143.0	43.0	49.0	112.0	139.0	167.0	193.0	185.0	171.0	326.0	135.6
1960	150.0	141.0	55.0	88.0	72.0	113.0	91.0	43.0	103.0	132.0	168.0	136.0	108.1
1961	73.0	39.0	22.0	37.0	63.0	98.0	116.0	194.0	139.0	168.0	298.0	392.0	137.1
1962	125.0	46.0	23.0	43.0	75.0	91.0	93.0	130.0	116.0	160.0	200.0	160.0	104.8
1963	61.0	67.0	33.0	191.0	144.0	125.0	129.0	139.0	111.0	129.0	163.0	106.0	117.3
1964	30.0	27.0	27.0	130.0	139.0	139.0	175.0	163.0	173.0	232.0	155.0	53.0	131.8
1965	221.0	61.0	22.0	20.0	164.0	70.0	80.0	82.0	89.0	147.0	161.0	244.0	108.1
1966	36.0	42.0	33.0	44.0	134.0	171.0	122.0	124.0	99.0	432.0	432.0	342.0	149.7
1967	127.0	98.0	31.0	147.0	190.0	150.0	122.0	196.0	138.0	151.0	176.0	157.0	149.4
1968	40.0	89.0	120.0	50.0	114.0	155.0	106.0	103.0	139.0	134.0	90.0	126.0	104.7
1969	71.0	55.0	33.0	44.0	25.0	73.0	51.0	94.0	102.0	153.0	163.0	155.0	86.2
1970	693.0	155.0	43.0	171.0	251.0	38.0	112.0	163.0	206.0	158.0	258.0	272.0	213.8

PAIS PANAMA
 PLANTA HIDROELECTRICA COCIE DEL NORTE
 CUENTA DEL P.T. COCIE
 CARGAS MEDICAS MENSUALES DEL REGISTRO MISTRICAL (EN M3/S)

PAIS PANAMA

PLANTA HIDROELECTRICA TERIBE I

CUENCA DEL RIO CHANGUINDOLA

CAUDALES MEDIOS MENSUALES DEL REGISTRO SINTETICO (EN M³)

ANO	ENE	FEB	MAR	ABR	MAY	JUN	JUL
1	66.7	38.8	25.8	111.3	87.4	80.1	68.3
2	44.1	34.2	35.5	24.6	44.7	97.4	105.1
3	52.1	31.0	34.3	43.9	53.3	107.3	75.9
4	38.7	26.5	19.9	39.0	56.0	75.2	88.7
5	29.3	26.8	13.5	39.0	41.6	84.3	83.2
6	40.9	38.2	25.1	25.6	79.8	82.0	92.9
7	49.1	10.6	23.4	36.6	59.8	74.0	77.5
8	56.0	84.9	44.0	40.3	61.4	70.5	78.7
9	53.6	82.5	41.4	118.1	73.9	85.5	102.8
10	57.3	38.0	34.0	16.3	59.6	60.9	75.5
11	64.8	49.3	49.1	53.4	55.9	79.0	96.7
12	48.0	91.5	46.2	48.7	37.9	53.2	59.5
13	72.2	20.7	24.0	48.0	66.0	88.8	106.1
14	59.9	18.1	29.2	53.3	87.7	103.4	102.2
15	39.2	29.3	14.8	40.0	48.2	58.3	76.7
16	89.6	41.8	33.2	40.1	86.7	86.9	104.6
17	66.8	29.1	37.9	25.6	33.5	77.0	68.3
18	73.6	64.2	60.1	60.1	54.5	88.3	79.9
19	73.6	73.5	40.9	43.2	94.9	128.3	108.2
20	54.9	19.5	26.9	26.2	101.2	97.6	91.0
21	41.2	21.0	23.6	75.5	74.9	102.8	94.5
22	53.0	64.1	42.7	40.3	65.6	79.9	87.3
23	51.8	40.6	19.4	7.4	34.2	83.3	91.9
24	67.9	45.0	25.4	46.2	74.7	102.0	75.5
25	38.6	22.3	9.1	32.1	48.3	79.4	98.6
26	51.6	30.6	44.8	45.0	62.9	76.7	91.4
27	39.9	42.3	25.5	39.9	74.5	90.3	88.4
28	101.4	75.0	43.2	69.5	74.2	81.3	71.0
29	53.7	37.7	21.9	13.7	85.2	100.1	72.7
30	51.2	35.7	12.9	33.5	67.2	59.0	84.2

B/S)

AGO	SEP	OCT	NOV	DEC	ANUAL
81.4	71.0	113.0	101.0	61.9	75.6
83.7	69.4	110.5	51.3	29.3	60.8
69.1	76.4	88.2	147.4	122.9	75.1
79.2	78.9	102.9	89.2	55.9	61.7
81.0	63.2	88.6	59.7	52.7	55.7
52.0	67.3	102.1	87.2	81.7	64.5
82.6	92.2	85.4	119.6	130.6	70.1
70.9	83.0	96.0	99.5	155.0	78.3
77.3	79.0	88.7	87.4	90.9	81.8
101.2	93.9	86.2	89.9	50.8	62.9
65.6	72.2	94.7	77.6	147.9	75.4
85.1	75.8	112.6	114.4	98.6	72.4
66.0	80.9	92.0	84.2	99.9	70.3
80.6	106.0	105.3	86.1	59.2	74.2
108.7	121.4	83.9	86.7	67.8	63.8
104.0	114.7	110.1	90.5	84.9	81.5
70.8	92.4	87.4	93.1	118.6	65.9
89.1	62.4	75.2	53.9	41.1	66.9
82.0	91.8	88.1	176.5	152.4	96.1
78.2	99.0	71.8	77.4	125.3	71.6
79.2	74.9	98.0	34.7	26.0	62.6
66.6	59.7	100.0	114.6	111.1	73.8
69.1	84.1	128.8	99.8	53.3	63.7
87.7	88.8	92.3	74.3	75.2	71.2
105.1	99.4	118.5	139.6	86.0	71.6
78.8	103.6	117.8	41.1	14.8	63.3
107.5	137.0	113.4	80.2	161.1	82.5
76.2	82.0	112.3	113.0	78.3	81.9
74.5	92.7	83.0	118.4	123.5	73.1
66.0	89.0	136.4	90.7	42.5	65.2

CUADRO 161

IS PANAMA
 AYTA HIDROELECTRICA TERIBE II
 REVA DEL RIV CHANGUYOJA
 AUDALES MEDICIS MENSUALES DEL REGISTRO SINTECO (EN M3/S)

ANO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1	29.3	17.1	11.4	42.2	38.5	35.2	30.1	35.8	31.2	49.7	44.4	27.2	33.3
2	19.4	15.0	15.6	12.0	10.7	42.0	46.2	36.8	31.5	48.6	22.6	12.9	26.7
3	22.0	13.6	15.1	10.3	23.5	47.2	33.4	30.4	33.6	38.8	64.9	54.1	33.1
4	12.6	11.7	3.8	17.2	24.5	32.1	39.0	34.8	34.7	45.3	39.2	24.6	27.1
5	12.0	11.8	3.1	17.2	13.3	37.1	36.6	35.6	27.8	39.0	26.3	23.2	24.5
6	18.0	16.9	11.0	11.3	34.3	36.1	43.9	22.9	29.6	44.9	38.4	35.9	28.4
7	21.6	8.6	10.3	16.1	22.4	32.6	34.1	36.3	40.6	37.6	52.6	57.5	30.9
8	24.6	37.4	10.4	17.7	27.0	31.0	34.6	31.2	36.5	42.2	43.8	68.2	34.5
9	23.6	36.3	10.2	12.0	32.5	37.6	45.2	34.0	34.8	39.0	38.5	40.0	36.0
10	25.2	16.7	15.0	7.4	22.3	26.8	33.2	44.5	41.3	37.0	39.6	22.4	27.7
11	21.5	21.7	21.2	23.5	24.5	34.3	42.5	28.9	31.8	41.7	34.1	65.1	32.2
12	18.0	40.3	25.3	20.1	16.4	27.3	26.2	37.4	31.2	49.5	50.3	43.4	31.8
13	31.8	9.1	10.6	13.0	29.0	30.1	46.7	29.0	35.6	40.5	37.0	44.0	30.9
14	26.4	3.0	12.5	23.5	33.5	45.5	45.0	35.5	46.6	46.3	37.9	26.0	32.6
15	12.8	12.9	6.5	17.6	21.2	25.0	33.7	47.8	53.4	36.9	38.1	29.8	28.0
16	35.5	13.4	14.6	17.6	38.1	38.2	46.0	45.8	50.5	48.4	30.8	37.4	35.9
17	20.4	12.8	16.7	11.3	14.7	22.9	30.1	31.2	36.3	38.5	41.0	52.2	29.0
18	22.4	28.2	26.4	25.4	24.1	38.9	35.2	39.2	27.5	33.1	23.7	18.1	29.4
19	32.4	32.3	13.0	19.0	41.3	56.5	47.6	36.1	40.4	38.8	77.7	67.1	42.3
20	24.2	8.6	11.8	11.5	44.4	28.5	40.0	34.4	43.6	31.6	34.1	55.1	31.5
21	18.1	9.2	12.6	33.2	33.0	45.2	41.6	34.8	33.0	43.1	15.3	11.4	27.5
22	23.7	20.2	18.8	17.7	28.9	35.2	38.4	29.3	26.3	44.0	50.4	48.0	32.5
23	22.0	17.0	3.5	2.3	15.1	25.0	40.4	30.4	37.0	56.7	43.9	23.5	28.0
24	19.9	19.3	11.2	20.3	32.9	44.7	33.2	38.6	38.1	40.6	32.7	73.1	31.4
25	9.1	9.8	4.0	14.1	21.3	34.9	43.4	46.2	43.7	52.1	61.4	37.8	31.5
26	22.7	13.5	10.7	10.8	27.7	23.7	40.2	34.7	45.6	51.8	18.1	6.5	27.8
27	13.2	18.6	11.2	17.6	32.3	40.0	38.9	47.3	60.3	49.9	35.3	70.9	36.3
28	44.6	33.0	21.2	30.6	33.0	35.8	31.2	33.5	36.1	49.4	49.7	34.5	36.0
29	23.6	16.6	3.6	6.0	37.8	44.0	32.0	32.8	40.8	36.5	52.1	54.3	32.2
30	22.6	15.7	5.7	17.2	29.5	29.9	37.0	29.0	39.2	60.0	39.9	18.7	28.7

CUADRO 162

NO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEPT	OCT	NOV	DIC	ANUAL
1	142.3	91.9	64.5	208.4	172.7	150.3	141.6	164.7	149.8	224.4	193.3	133.7	154.0
2	100.9	82.2	42.3	64.3	102.4	132.1	202.9	164.5	144.6	220.4	111.7	69.0	128.1
3	113.2	75.7	70.4	97.0	117.0	207.1	160.5	145.4	157.5	178.4	269.7	241.0	153.5
4	71.6	67.0	51.2	15.7	118.4	154.5	172.6	159.0	161.1	204.8	175.4	122.6	122.8
5	73.8	67.9	43.8	16.9	94.7	170.9	167.6	162.7	135.9	182.7	129.6	111.3	113.5
6	92.1	89.0	62.2	65.2	157.3	155.1	180.1	116.2	138.8	206.2	172.7	161.6	134.2
7	100.5	54.1	57.5	32.2	111.8	153.9	156.4	165.6	184.4	168.4	225.6	244.7	142.7
8	120.4	169.4	99.7	93.6	131.2	147.0	156.8	147.2	167.8	191.2	192.8	272.6	157.5
9	113.7	164.0	94.0	221.6	151.5	172.0	195.9	154.4	159.9	178.5	174.3	176.5	163.0
10	122.9	88.9	79.6	50.4	111.8	130.2	148.9	194.4	189.0	169.7	177.9	116.5	131.7
11	137.1	109.9	107.3	116.2	122.5	162.9	186.1	137.1	148.0	191.7	157.9	254.8	152.6
12	92.3	177.1	102.4	101.5	92.4	137.0	128.6	171.4	150.6	223.8	214.9	193.1	148.6
13	140.4	55.4	53.4	92.7	136.9	177.5	201.6	136.5	161.7	184.2	168.5	188.1	142.6
14	126.6	50.5	66.3	110.2	173.3	200.2	199.4	160.1	205.5	202.2	168.7	125.0	149.0
15	72.8	22.2	41.5	87.1	107.4	126.2	149.8	205.8	235.3	157.0	171.6	140.1	130.6
16	163.2	96.0	73.3	91.6	172.9	173.1	198.1	195.7	221.7	208.7	174.7	163.8	161.5
17	138.9	72.0	76.0	65.3	84.0	150.5	144.0	148.5	168.0	175.1	183.5	219.1	137.1
18	159.4	135.4	130.4	128.9	121.3	178.3	164.3	175.8	135.7	156.7	121.6	93.8	141.0
19	151.0	151.6	94.3	93.0	187.5	239.1	213.8	162.1	181.8	173.9	313.9	291.0	188.2
20	119.9	54.3	64.4	65.0	196.0	172.5	177.8	157.2	194.3	138.5	158.7	223.8	143.5
21	91.7	55.8	67.2	147.1	151.9	129.7	188.4	158.9	154.3	197.0	95.3	59.4	129.7
22	115.6	134.0	96.9	93.3	138.1	153.2	172.4	139.7	128.2	204.5	217.5	214.3	151.5
23	113.6	93.7	51.5	32.3	84.3	171.1	180.9	143.2	168.6	247.3	198.1	116.6	132.7
24	141.8	101.9	63.6	101.0	152.4	188.1	159.0	174.2	179.8	182.9	151.9	147.9	146.3
25	55.2	58.3	29.5	71.0	106.7	162.7	188.6	198.1	196.9	227.0	252.7	177.4	143.7
26	114.6	75.9	99.6	100.0	133.2	157.7	177.3	158.0	201.8	224.7	91.5	40.0	131.2
27	73.1	95.1	62.7	89.2	151.9	180.5	176.5	203.4	260.7	209.1	156.4	268.4	160.6
28	193.3	153.3	107.8	144.1	154.3	195.9	147.6	156.6	167.5	220.6	212.2	161.6	165.3
29	117.8	88.8	53.7	44.6	170.3	125.1	153.7	154.0	185.2	163.6	223.8	234.1	149.0
30	172.3	84.5	31.5	197.2	140.2	140.9	162.4	138.6	176.7	258.1	171.7	95.5	127.6

CUADRO 163

PAIS PANAMA
 PLANTA HIDROELECTRICA COCIE DEL NORTE
 CUENTA DEL PTC COCIE
 CANTIDADES MENSUALES DEL REGISTRO SINTECO (EN M3/S)

ANO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1	169.1	61.9	37.0	239.3	221.4	194.0	72.2	98.3	87.3	156.1	188.9	105.6	126.6
2	50.6	50.1	75.1	31.2	53.0	207.5	156.8	166.1	118.2	169.8	83.1	59.1	102.4
3	147.9	53.7	75.1	103.9	105.0	245.4	113.2	101.0	108.3	115.9	372.6	313.0	154.7
4	147.0	36.3	26.1	36.5	90.4	104.6	113.5	121.9	113.1	147.7	163.2	100.2	105.1
5	8.3	38.2	22.3	1.2	54.4	161.6	118.9	131.7	95.8	113.7	99.5	111.3	79.9
6	51.3	57.6	30.0	87.0	201.1	113.4	119.8	58.0	87.4	134.3	156.3	166.2	106.3
7	53.5	16.8	46.6	125.6	127.4	115.7	101.6	124.4	133.3	119.7	267.6	300.3	127.2
8	17.0	116.0	34.0	71.1	116.5	71.0	92.6	83.9	108.7	129.4	194.2	313.8	112.3
9	147.0	110.8	29.5	222.3	159.3	136.6	135.1	131.7	120.1	123.0	165.0	193.3	139.5
10	82.2	52.3	61.6	96.5	63.1	23.6	76.1	149.8	129.8	118.7	173.0	90.7	92.3
11	205.9	86.2	114.0	74.2	83.5	119.7	126.5	95.7	102.2	126.8	136.6	285.1	129.8
12	147.9	129.0	34.4	82.0	27.3	59.6	58.5	99.0	84.4	153.6	229.2	207.4	109.4
13	170.4	22.7	46.4	137.5	170.3	171.2	150.2	114.1	126.0	132.4	155.7	209.8	133.9
14	93.0	12.7	67.3	140.3	225.5	211.0	150.5	153.7	178.9	182.1	159.4	115.3	140.2
15	3.2	41.9	11.4	162.7	130.5	35.1	83.3	175.1	185.8	138.2	169.6	145.3	106.8
16	215.4	82.0	52.9	104.5	212.4	131.7	135.8	199.3	190.1	195.6	169.2	177.6	163.9
17	174.6	41.5	97.8	14.6	120.2	129.2	87.4	85.0	108.5	112.3	179.7	249.9	115.1
18	143.8	95.9	151.2	36.2	46.0	152.8	107.3	145.2	94.8	86.9	91.1	89.8	104.2
19	206.5	136.4	39.5	92.2	223.1	202.2	170.6	173.1	158.4	140.2	514.0	440.0	223.8
20	147.9	5.0	59.6	82.4	247.4	112.0	111.2	116.2	147.7	99.7	147.7	259.8	128.2
21	147.9	13.6	65.1	176.7	187.0	219.4	142.9	146.3	119.6	142.9	60.0	70.7	124.8
22	162.0	100.7	51.4	67.5	128.0	115.3	112.6	89.4	79.8	128.6	237.5	243.2	128.1
23	76.2	51.2	12.4	47.1	54.5	172.3	135.7	114.9	128.7	209.7	182.0	74.1	101.6
24	231.1	81.9	23.7	147.8	206.4	230.3	109.3	145.2	132.7	134.4	131.7	158.0	143.0
25	147.0	34.4	5.3	162.3	141.0	152.0	140.3	208.7	165.2	203.8	320.6	171.9	154.5
26	60.7	39.3	139.1	51.0	103.5	98.4	114.0	120.1	158.6	196.9	70.1	35.1	99.0
27	49.6	70.6	26.3	133.5	197.5	171.7	125.7	205.8	241.6	225.3	147.0	309.9	158.7
28	316.5	125.1	64.5	129.5	163.5	114.0	83.3	94.0	106.7	162.3	226.5	153.6	145.0
29	82.5	54.1	20.3	70.1	212.8	176.7	96.7	101.2	131.6	113.8	264.5	285.8	135.9
30	6.5	39.8	3.3	50.1	162.9	73.7	94.2	72.2	119.8	219.0	155.0	42.8	85.0

Cuadro 164

PANAMA: CUENCAS DE LOS RIOS CHANGUINOLA Y COCLE. COMPARACION DE REGISTROS HISTORICOS Y GENERADOS

Proyecto	Caudales medios mensuales (m ³ /s)												Anual
	Ene.	Feb.	Marzo	Abril	Mayo	Junio	Jul.	Agosto	Sept.	Oct.	Nov.	Dic.	
<u>Teribe I</u>													
Histórico	63.5	45.9	32.2	39.0	60.3	81.4	86.6	84.0	89.0	100.8	98.8	93.9	73.0
Sintético	54.0	42.4	31.4	44.5	64.3	84.8	86.6	80.6	86.2	99.4	92.6	86.6	71.1
<u>Teribe II</u>													
Histórico	27.9	20.2	14.2	17.2	26.5	35.8	38.1	37.0	39.2	44.4	43.5	41.3	32.1
Sintético	23.8	18.7	13.8	19.6	28.3	37.3	38.1	35.5	37.9	43.8	40.8	38.1	31.3
<u>Changuinola</u>													
Histórico	132.9	102.2	76.0	88.3	128.4	165.3	170.8	166.8	178.5	197.8	190.1	181.6	148.2
Sintético	116.4	95.5	74.1	90.4	134.9	170.5	171.7	161.6	173.7	195.7	180.3	168.6	144.5
<u>Coclé del Norte</u>													
Histórico	147.9	71.0	50.4	86.5	120.8	128.8	111.3	133.2	134.0	152.7	202.5	207.4	128.9
Sintético	126.5	62.5	51.2	101.2	141.1	140.4	114.5	127.4	128.8	147.8	187.0	182.6	125.9

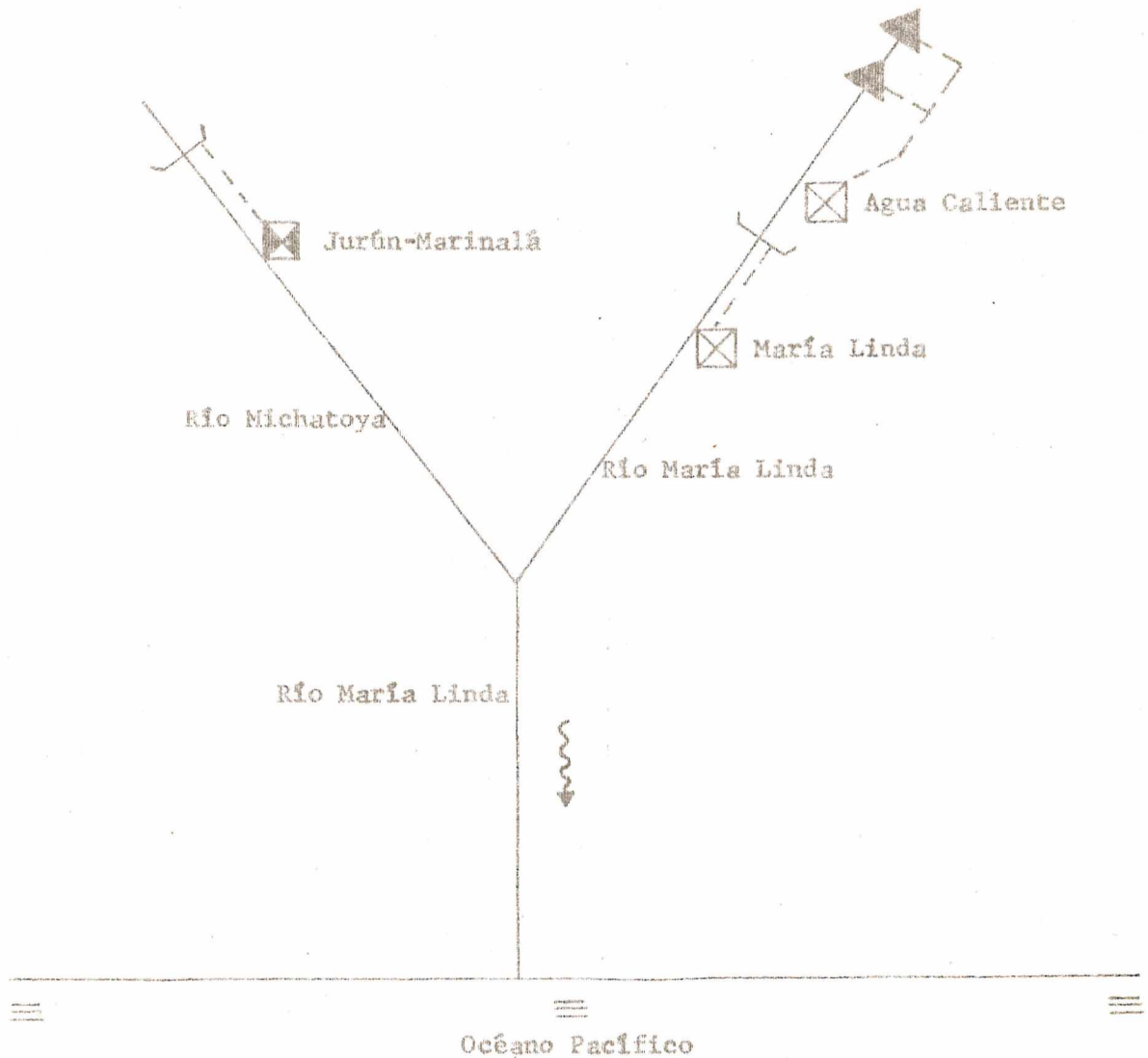
FIGURAS

100

100

Figura 1

GUATEMALA: ESQUEMA DE APROVECHAMIENTOS HIDROELECTRICOS
EN LA CUENCA DEL RIO MARIA LINDA



Nomenclatura

Nota: La nomenclatura es igual para todos los ríos y países estudiados.







- | | | | |
|---|--------------------------|---|------------------------------------|
|  | Presas de almacenamiento |  | Planta hidroeléctrica en operación |
|  | Presas de derivación |  | Conducción artificial de agua |
|  | Planta hidroeléctrica |  | Dirección de la corriente |

Figura 2

GUATEMALA: ESQUEMA DE APROVECHAMIENTOS HIDROELECTRICOS
EN LA CUENCA DEL RIO LOS ESCLAVOS

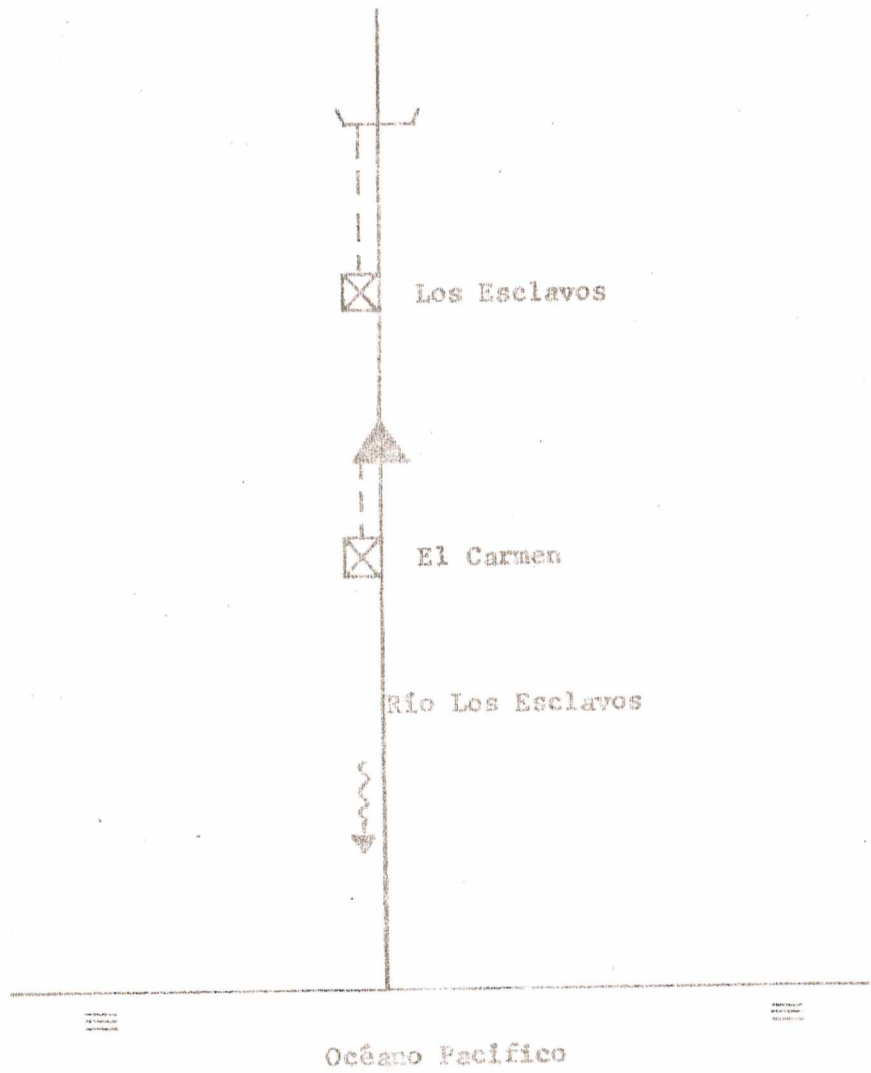


Figura 3

GUATEMALA; ESQUEMA DE APROVECHAMIENTOS HIDROELECTRICOS EN LA CUENCA DEL RIO CHIXOY

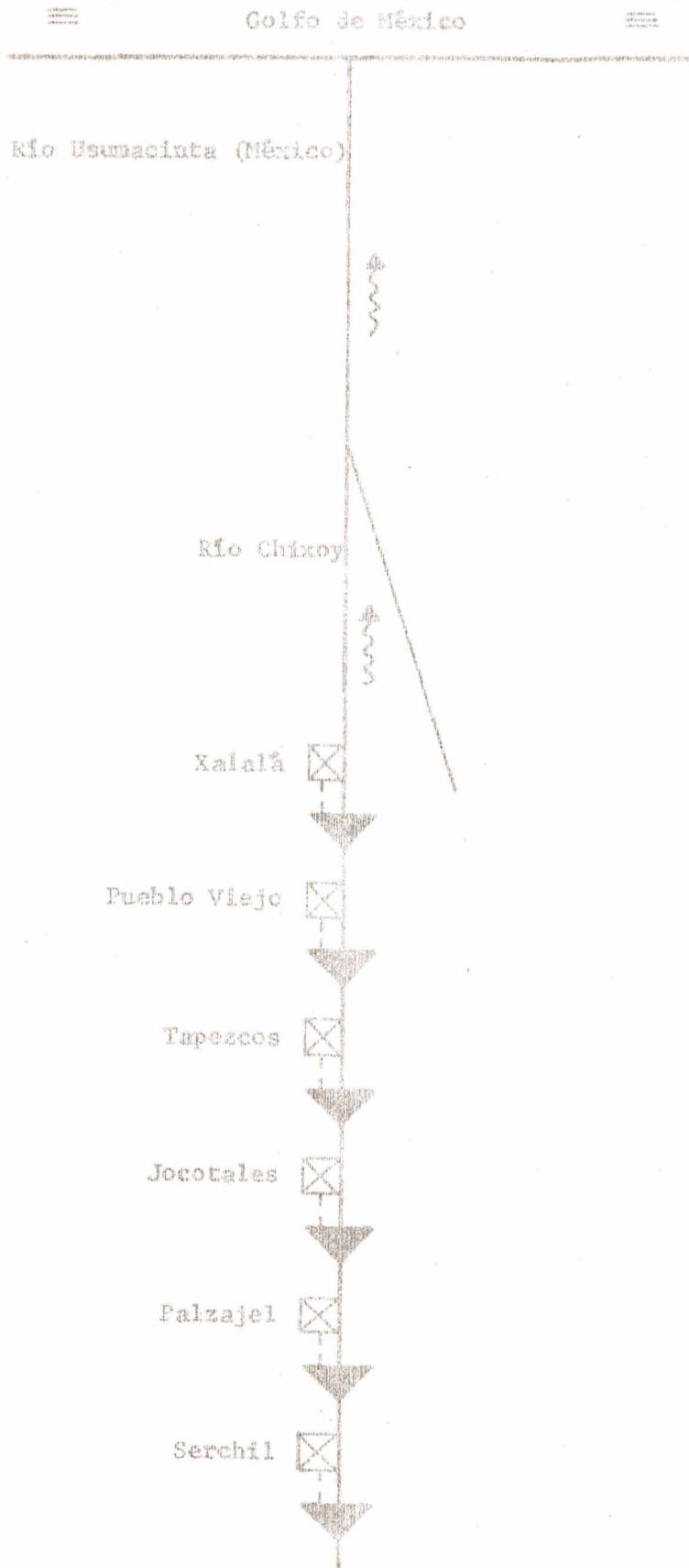


Figura 4

GUATEMALA: ESQUEMA DE APROVECHAMIENTOS HIDROELECTRICOS
EN LAS CUENCAS DE LOS RIOS POLOCHIC, CAHABÓN y SAUCE

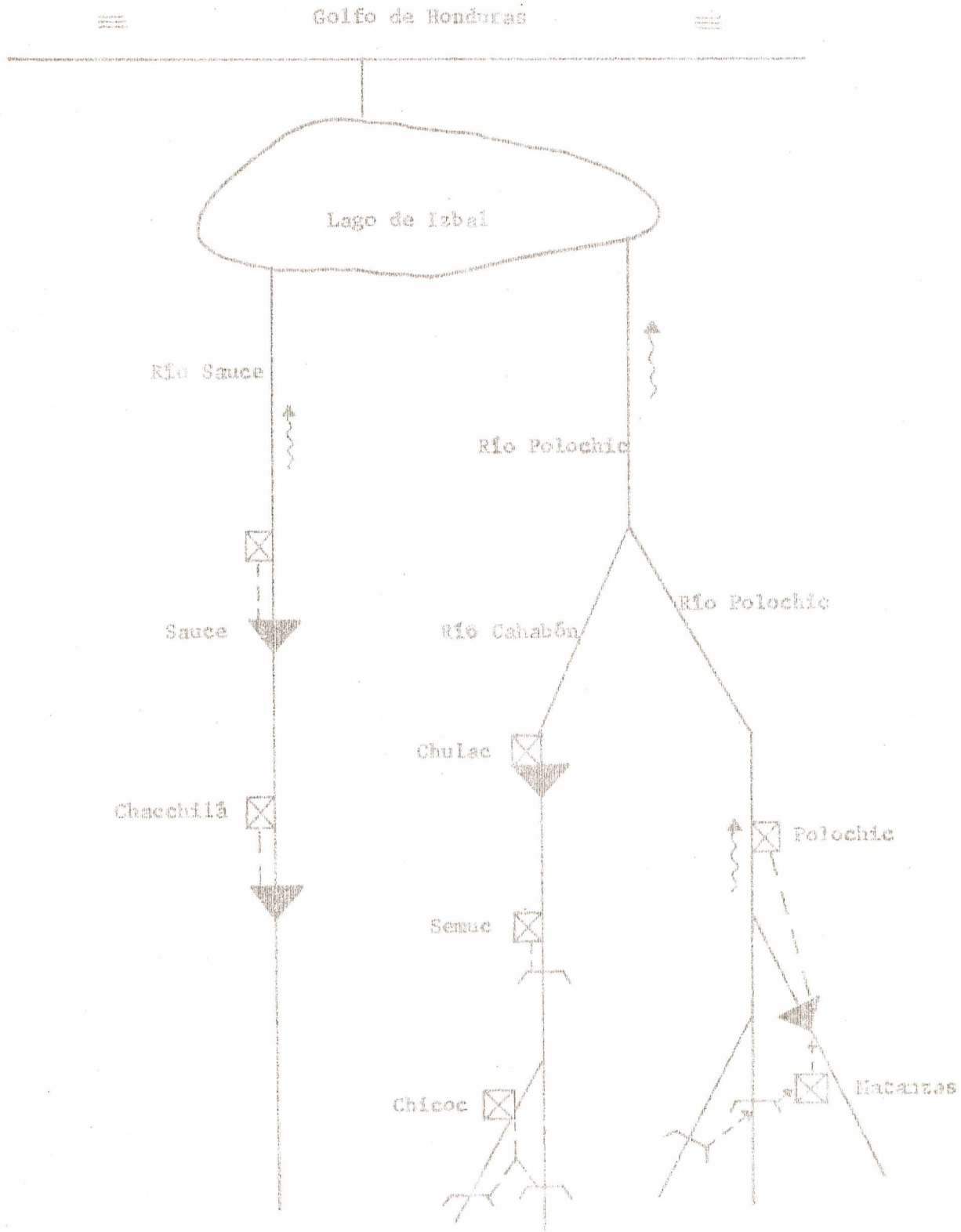


Figura 5

GUATEMALA: ESQUEMA DE APROVECHAMIENTOS HIDROELECTRICOS
EN LA CUENCA DEL RIO IXCAN

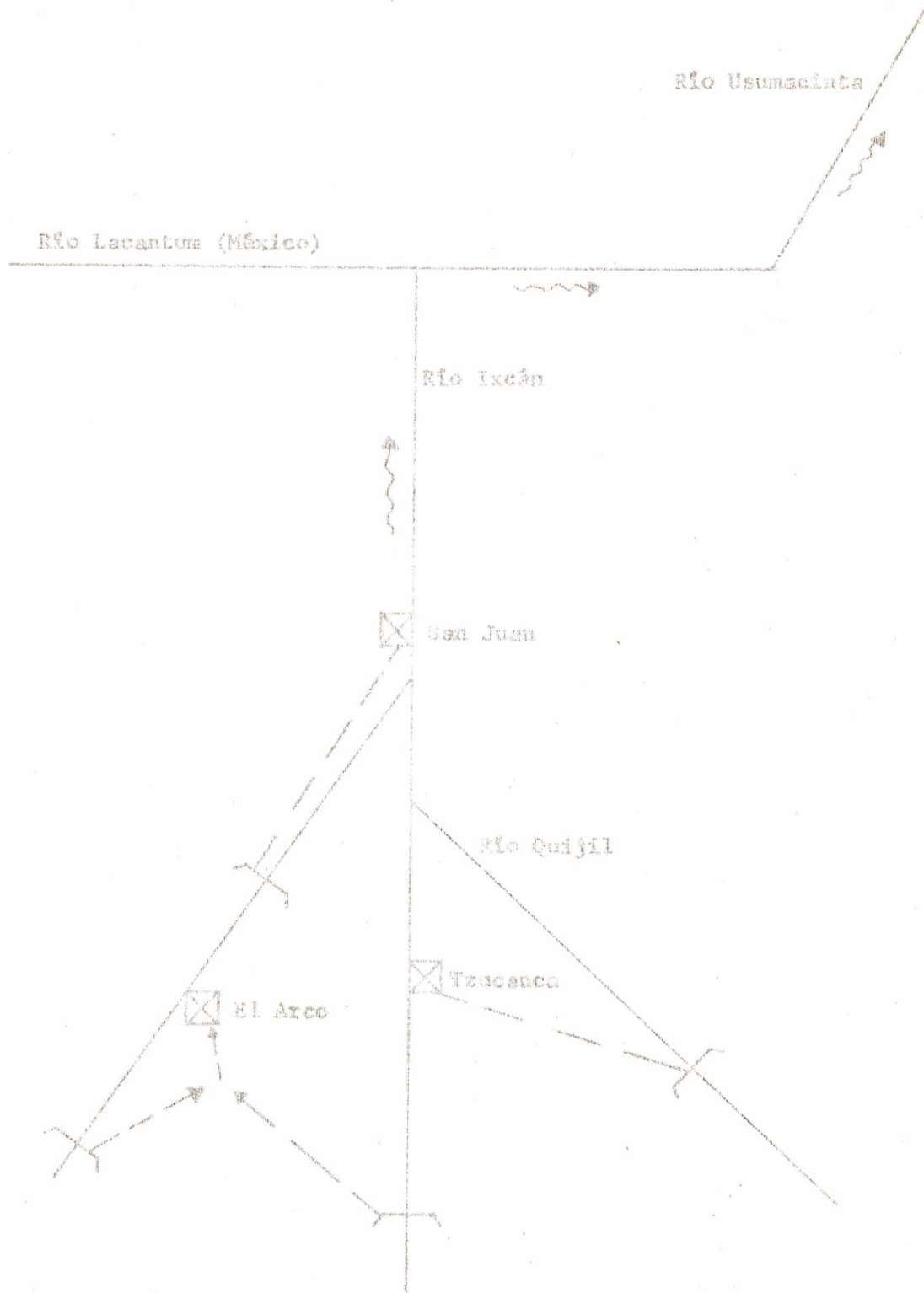


Figura 6

GUATEMALA: ESQUEMA DE APROVECHAMIENTOS HIDROELECTRICOS
EN LA CUENCA DEL RIO XALBAL

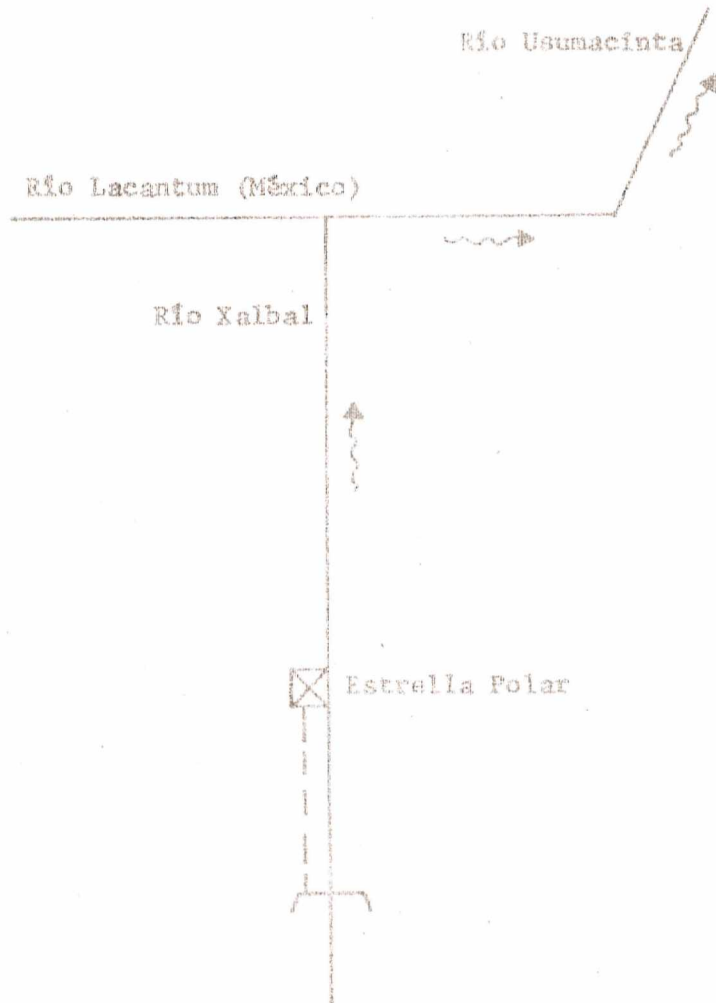


Figura 7

GUATEMALA: ESQUEMA DE APROVECHAMIENTOS HIDROELECTRICOS EN LAS CUENCAS DE LOS RIOS SAMALÁ Y NAHUALATE

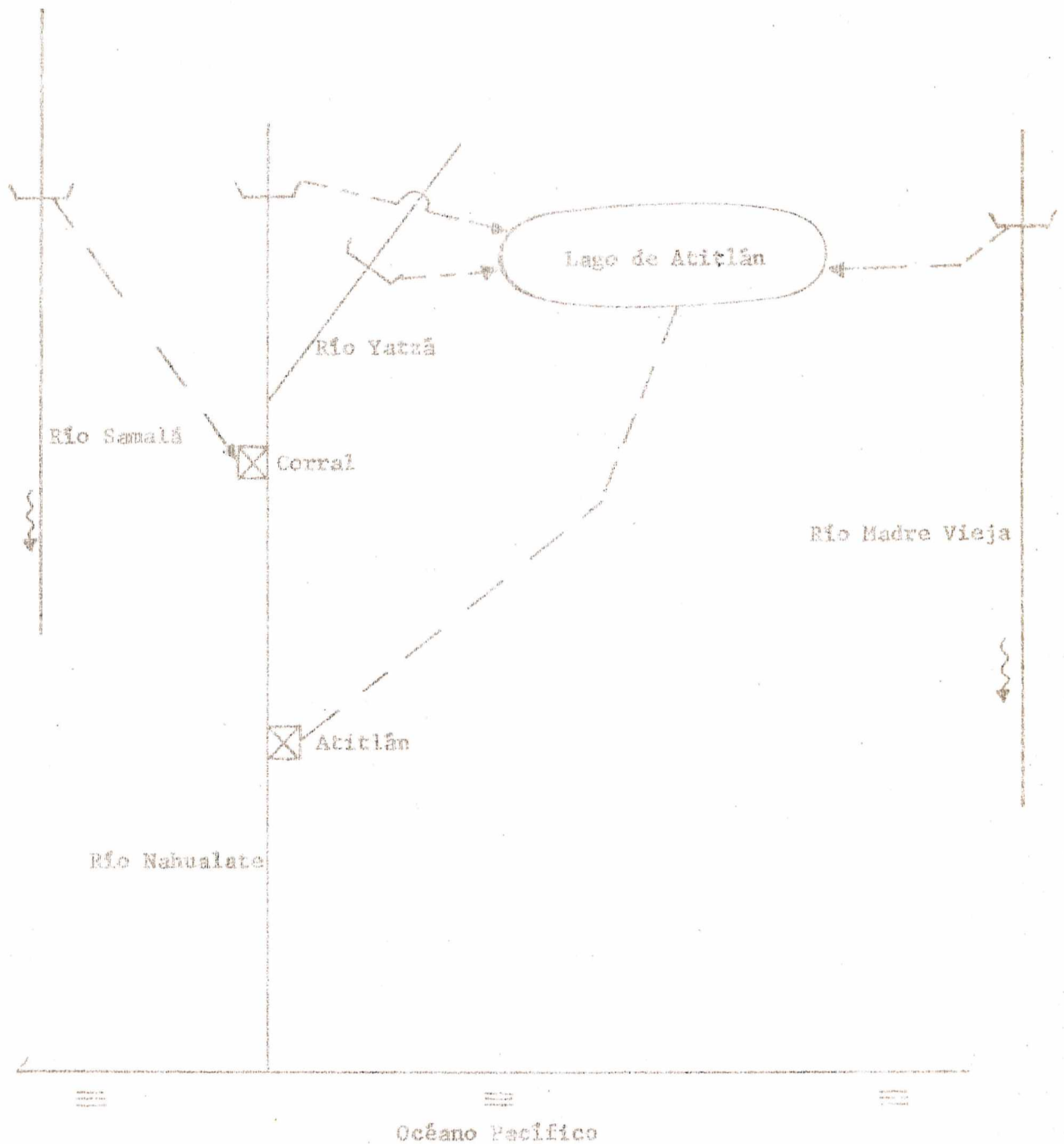


Figura 8

EL SALVADOR: ESQUEMA DE APROVECHAMIENTOS HIDROELECTRICOS
EN LA CUENCA DEL RIO LEMPA

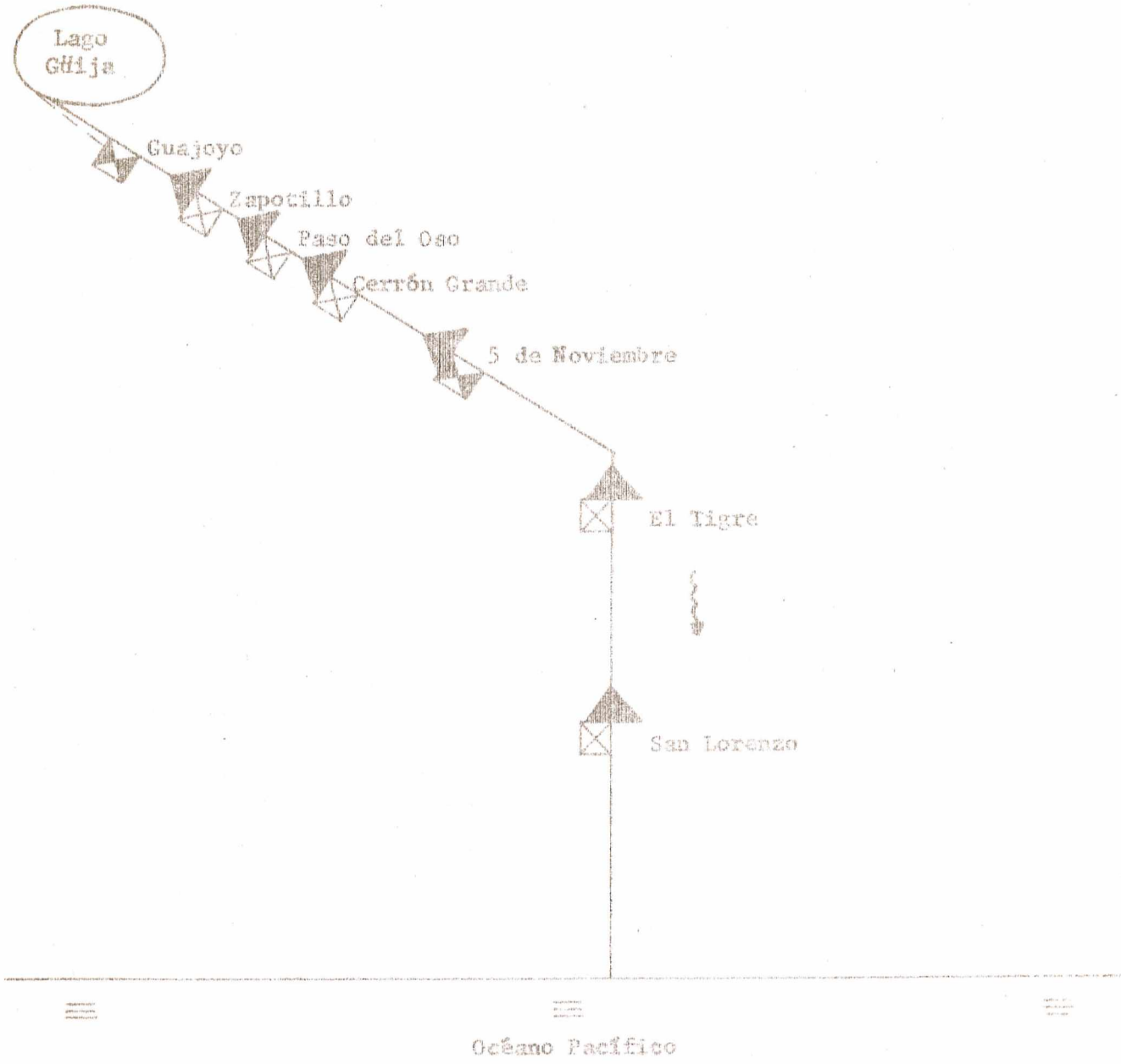


Figura 9

HONDURAS: ESQUEMA DE APROVECHAMIENTOS HIDROELECTRICOS
EN LA CUENCA DEL RIO UJUA

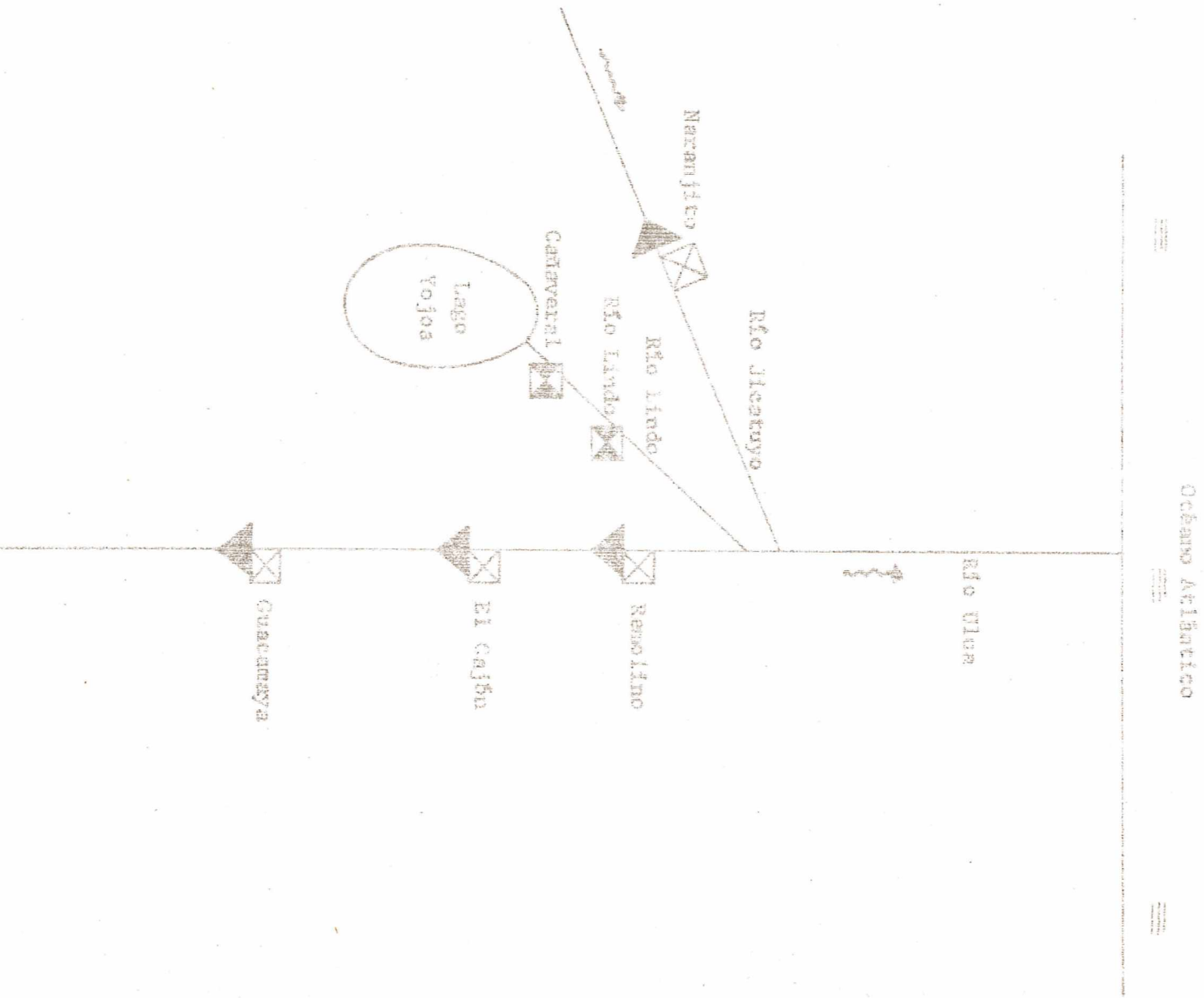


Figura 10

HONDURAS: ESQUEMA DE APROVECHAMIENTOS HIDROELECTRICOS
EN LA CUENCA DEL RIO PATUCA

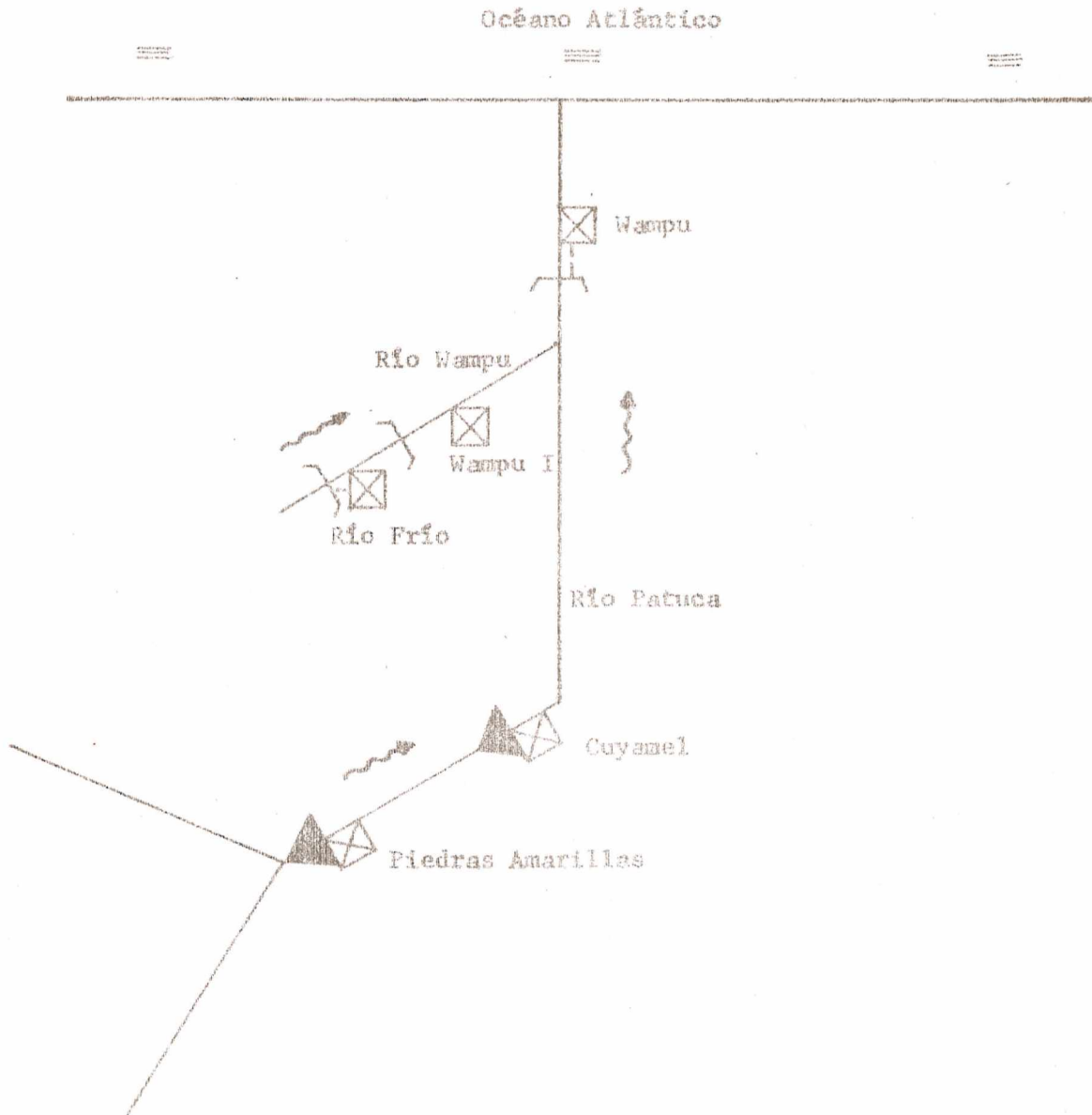


Figura 11

HONDURAS: ESQUEMA DE APROVECHAMIENTOS HIDROELECTRICOS
EN LA CUENCA DEL RIO SICO

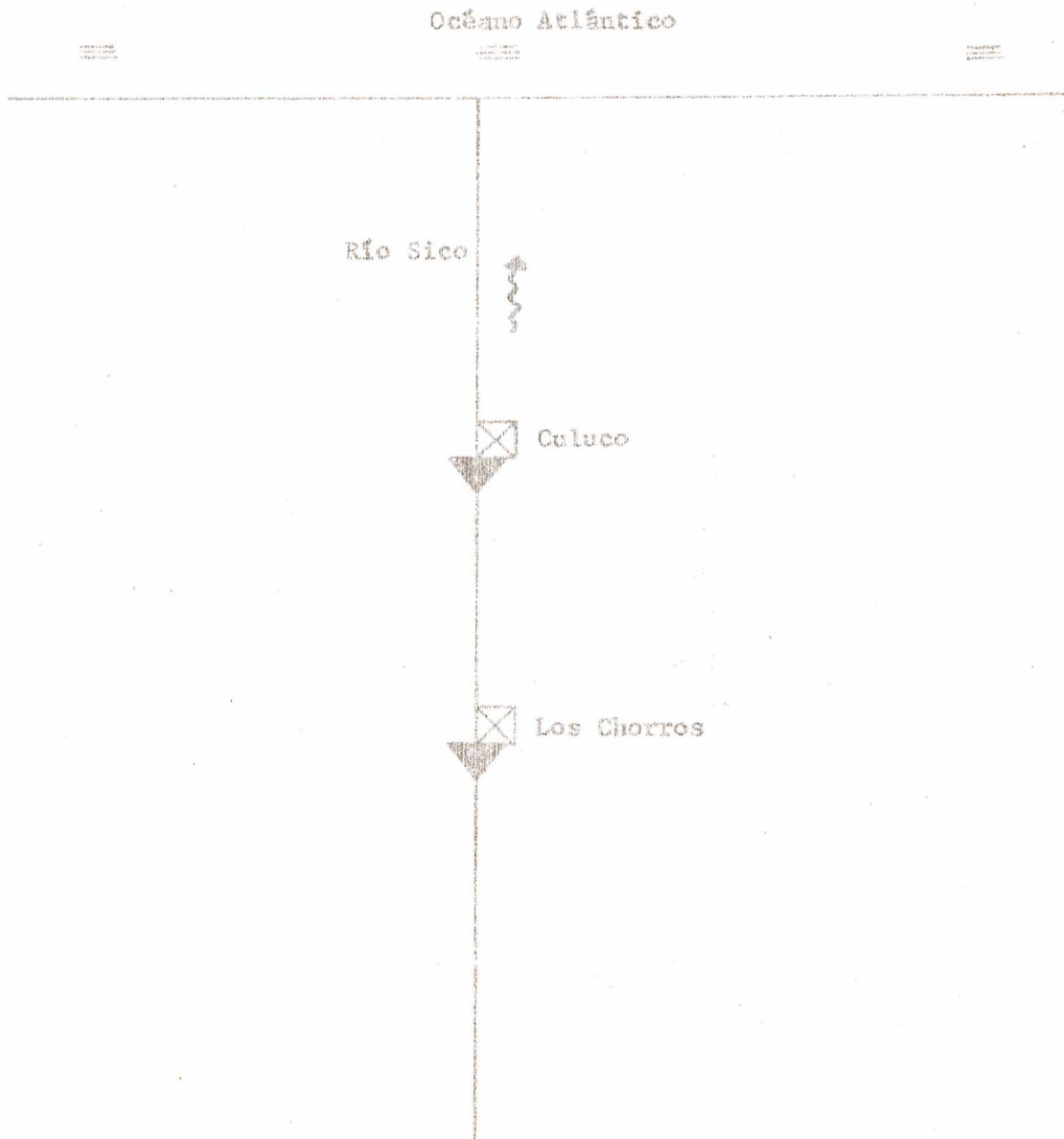


Figura 12

NICARAGUA: ESQUEMA DE APROVECHAMIENTOS HIDROELECTRICOS
EN LA CUENCA DE LOS RIOS GRANDE DE MATAGALPA Y VIEJO

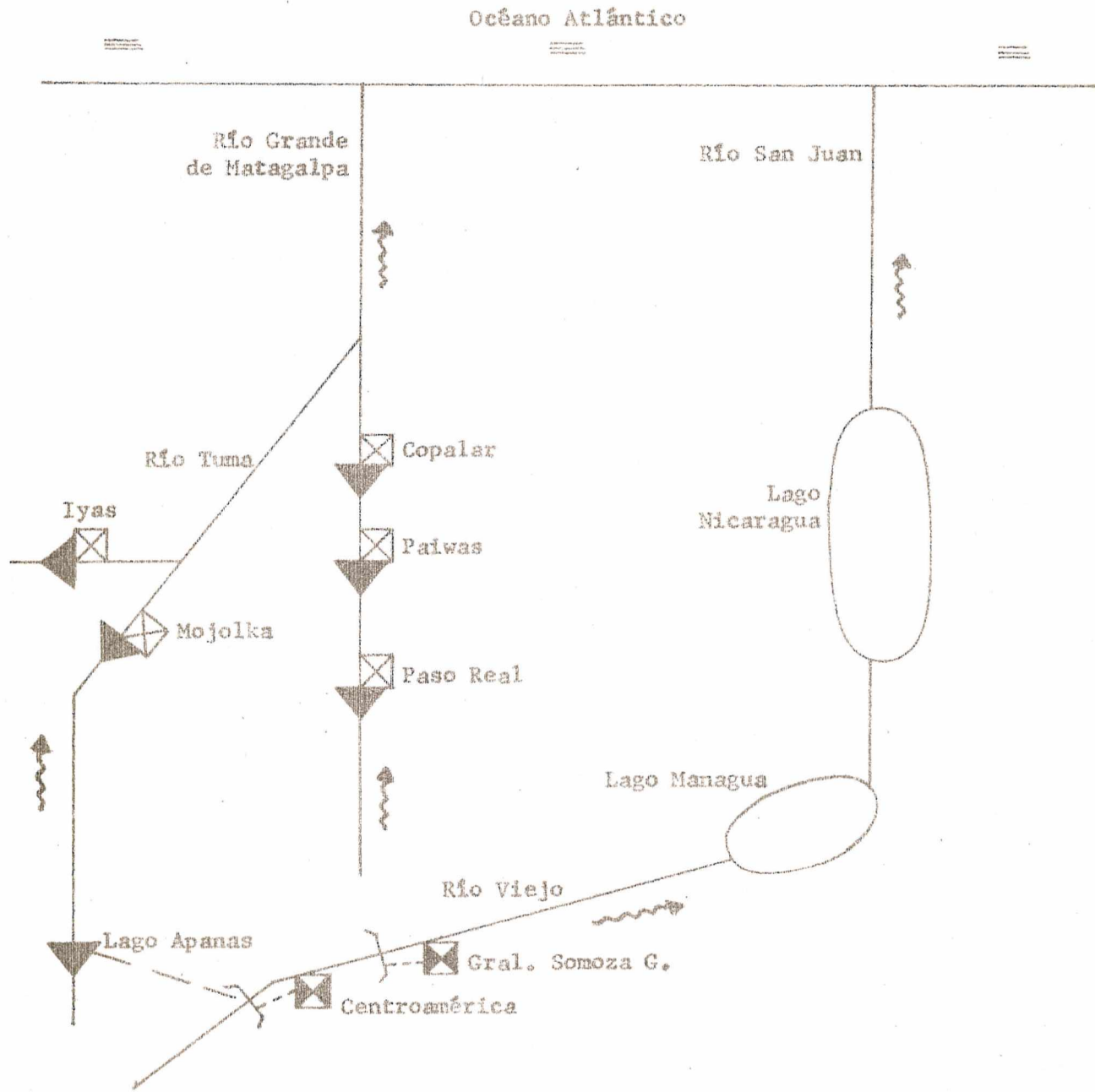


Figura 13

NICARAGUA: ESQUEMA DE APROVECHAMIENTOS HIDROELECTRICOS EN
LAS CUENCAS DE LOS RIOS COCO Y ESCONDIDO

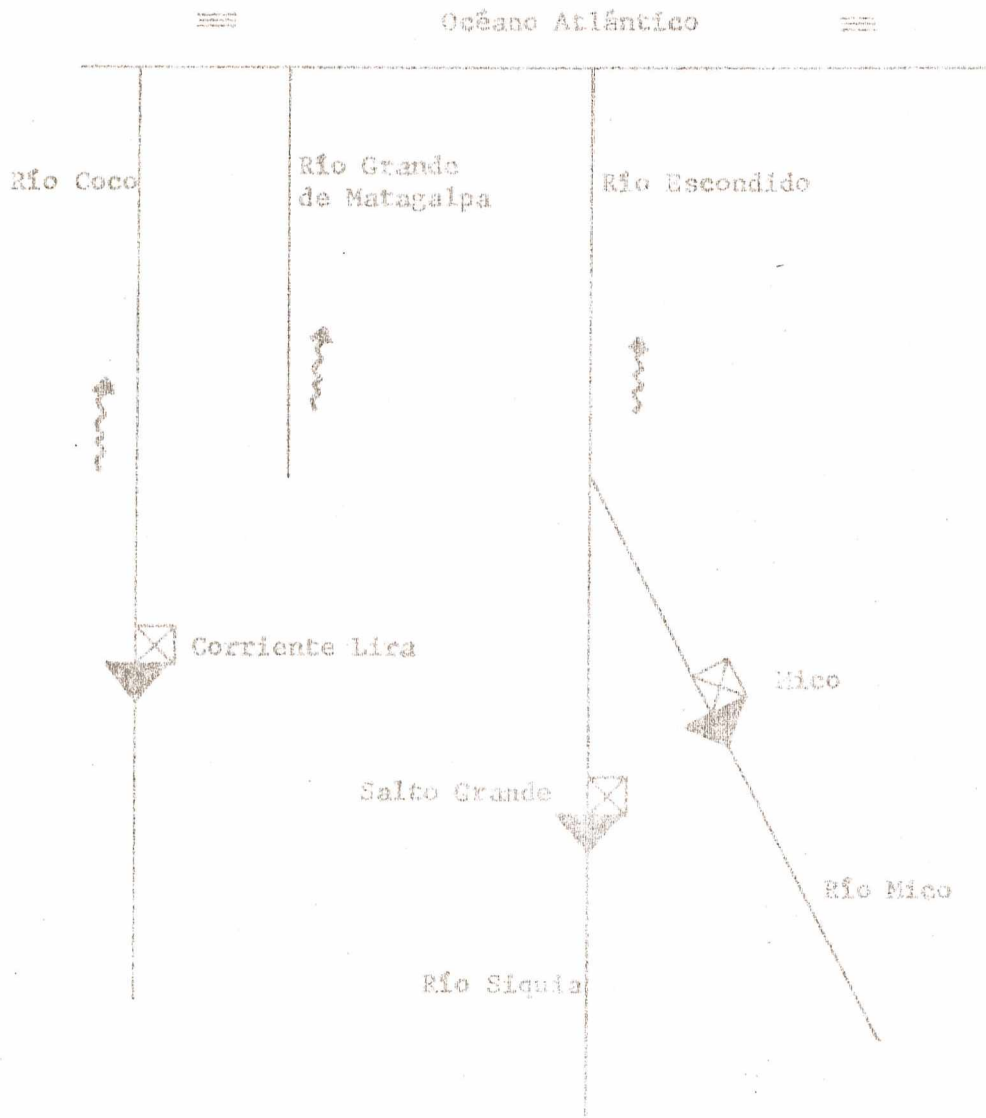


Figura 14

COSTA RICA: ESQUEMA DE LOS APROVECHAMIENTOS HIDROELECTRICOS
EN LAS CUENCAS DE LOS RIOS REVENTAZON Y PACUARE

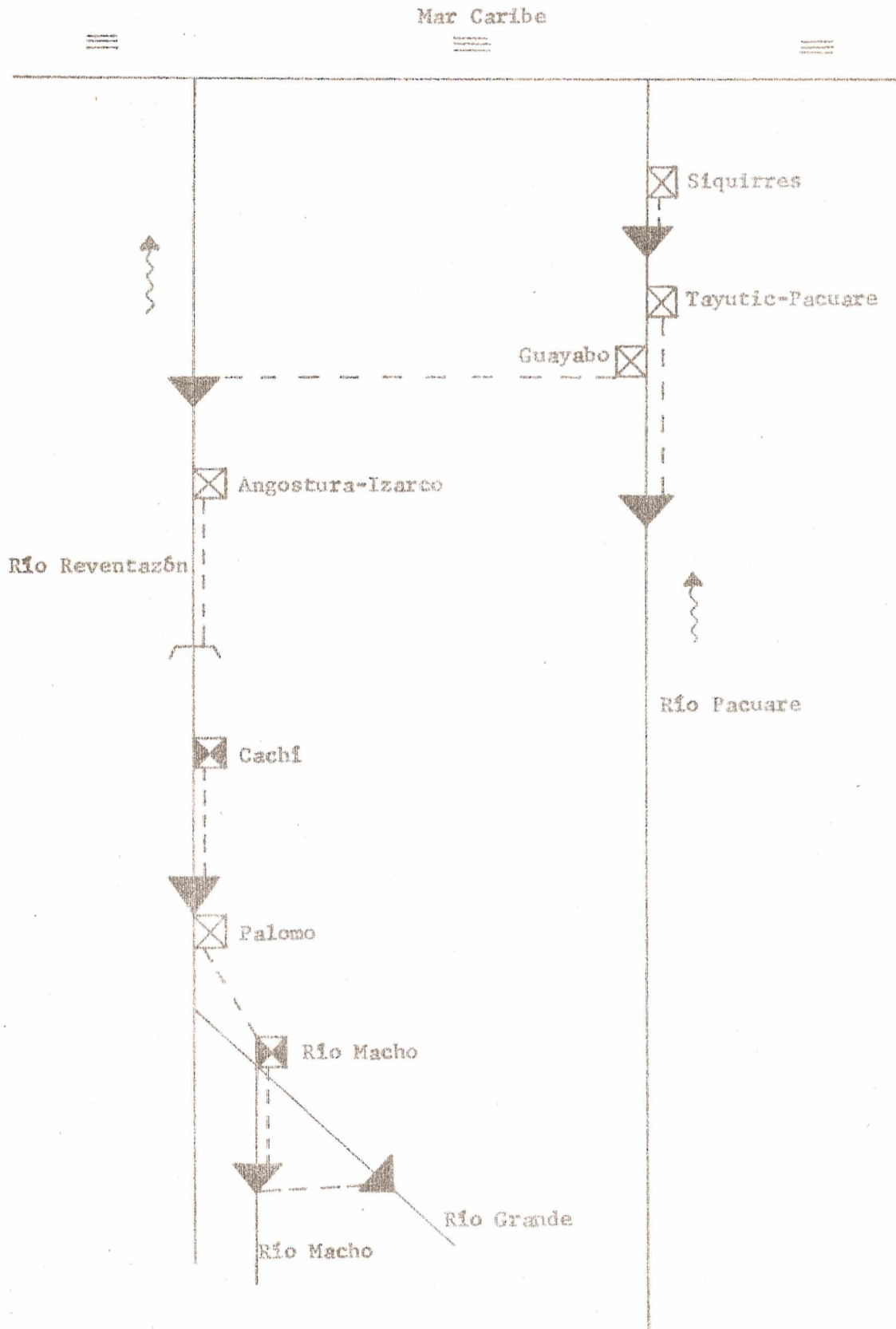


Figura 15

COSTA RICA: ESQUEMA DE APROVECHAMIENTOS HIDROELECTRICOS
EN LA CUENCA DEL RIO GRANDE DE TARCOLES

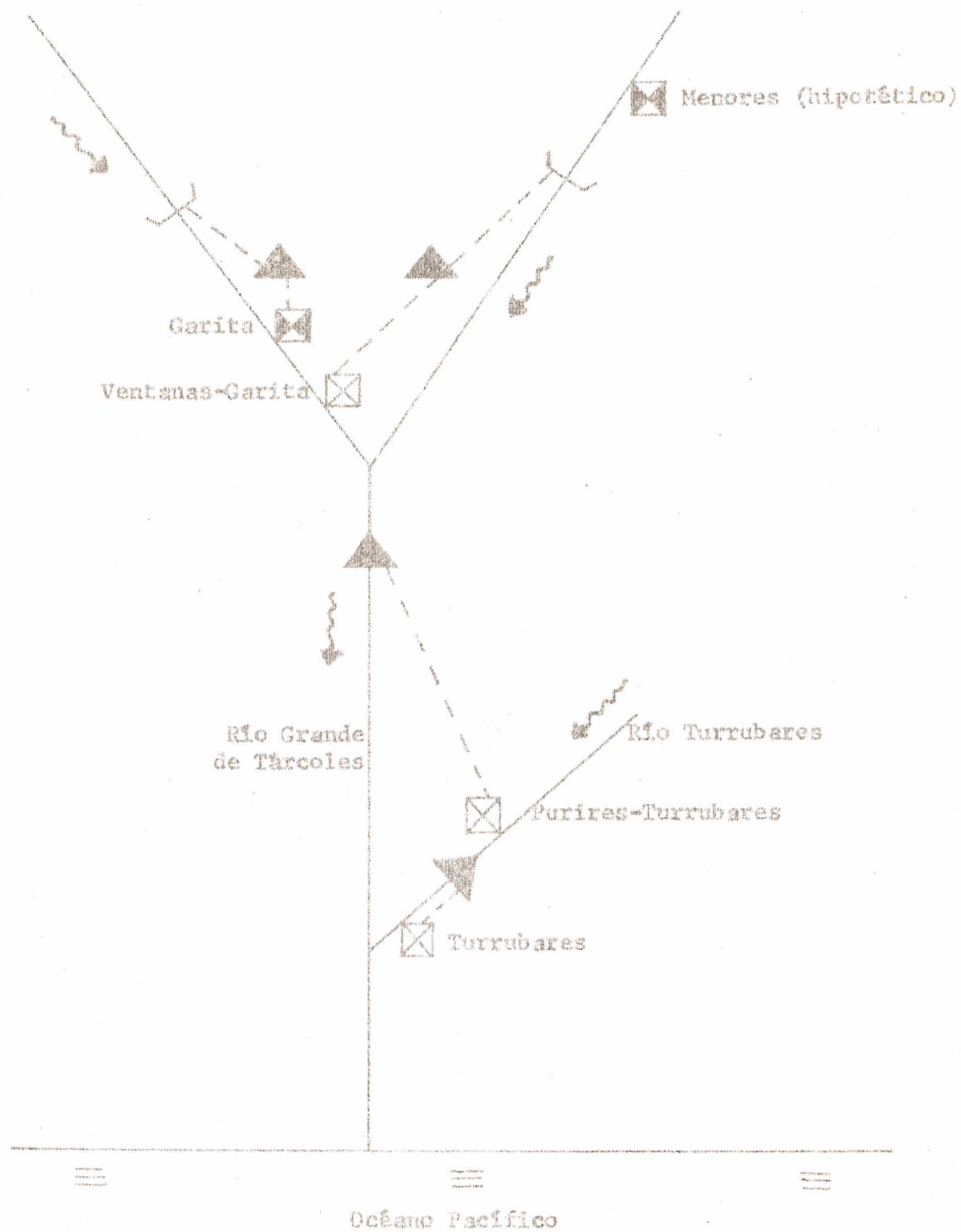


Figura 16

COSTA RICA; ESQUEMA DE APROVECHAMIENTOS HIDROELECTRICOS
EN LA CUENCA DEL RIO GRANDE DE TERRABA

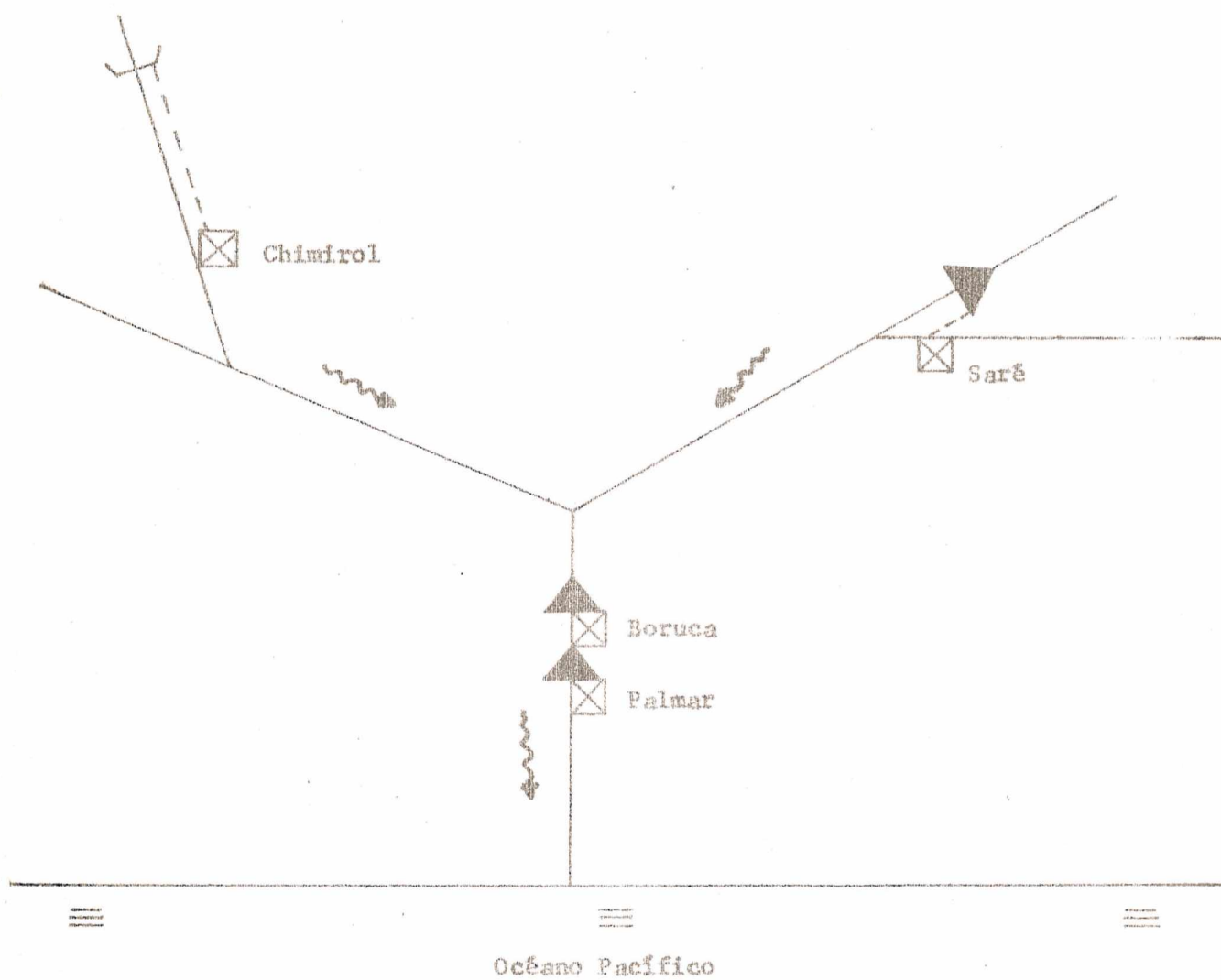


Figura 17

COSTA RICA: ESQUEMA DE APROVECHAMIENTOS HIDROELECTRICOS
EN LAS CUENCAS DE LOS RIOS PARRITA Y SAVEGRE

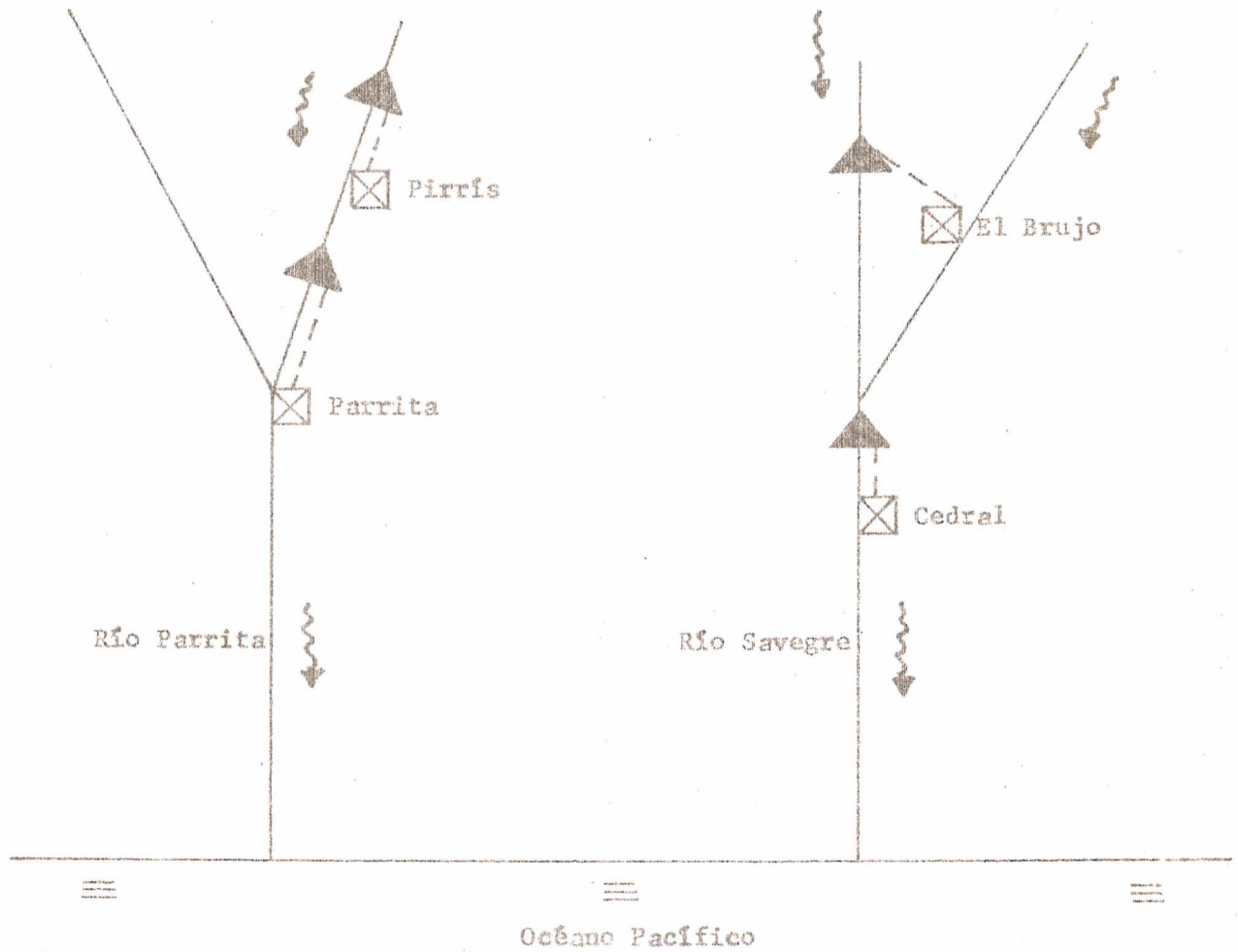


Figura 18

COSTA RICA: ESQUEMA DE APROVECHAMIENTOS HIDROELECTRICOS
EN LAS CUENCAS DE LOS RIOS SARAPIQUI Y CHIRRIPO

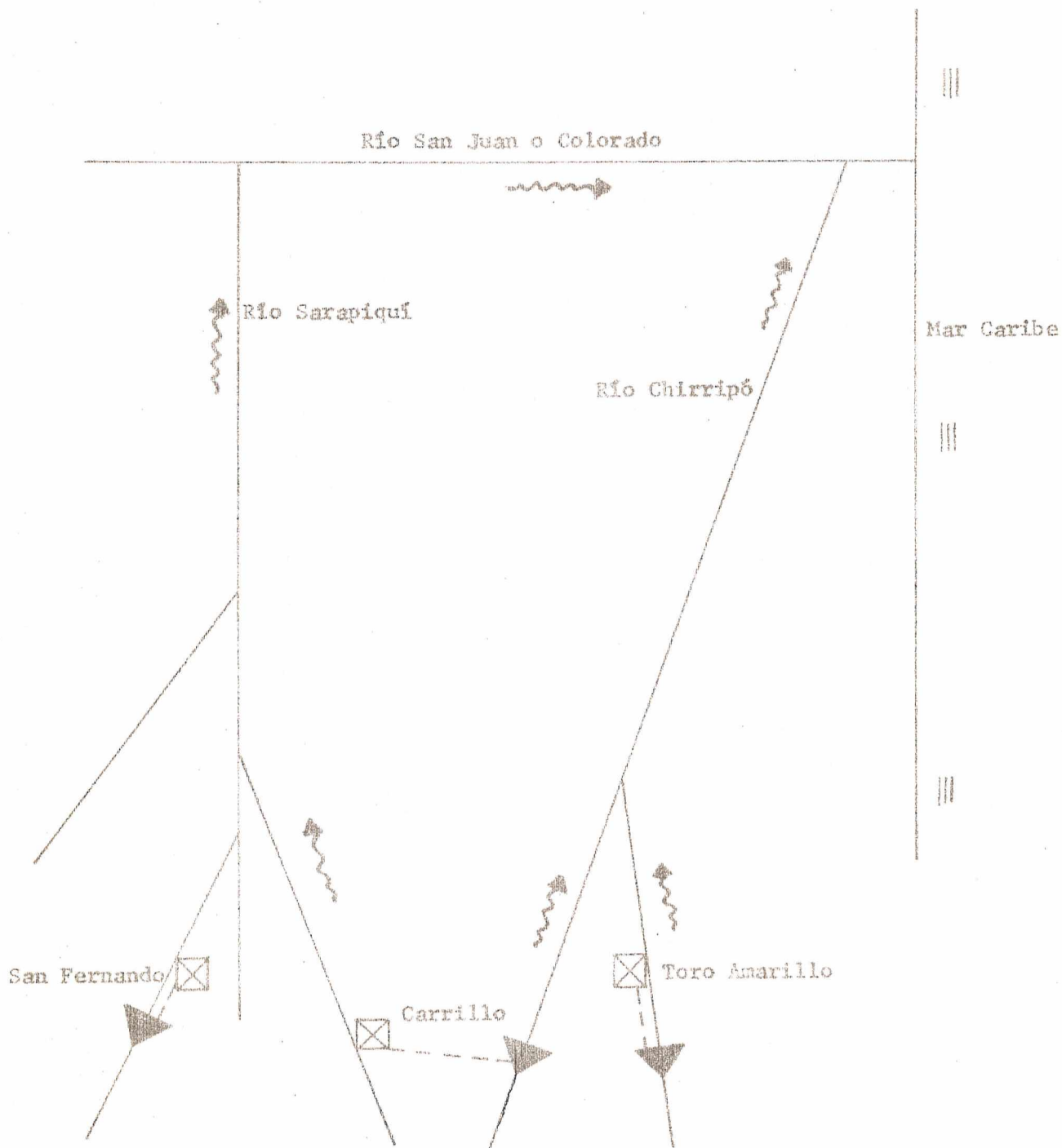


Figura 19

COSTA RICA: ESQUEMA DE APROVECHAMIENTOS HIDROELECTRICOS EN LAS CUENCAS DE LOS RIOS SAN CARLOS Y BEBEDERO

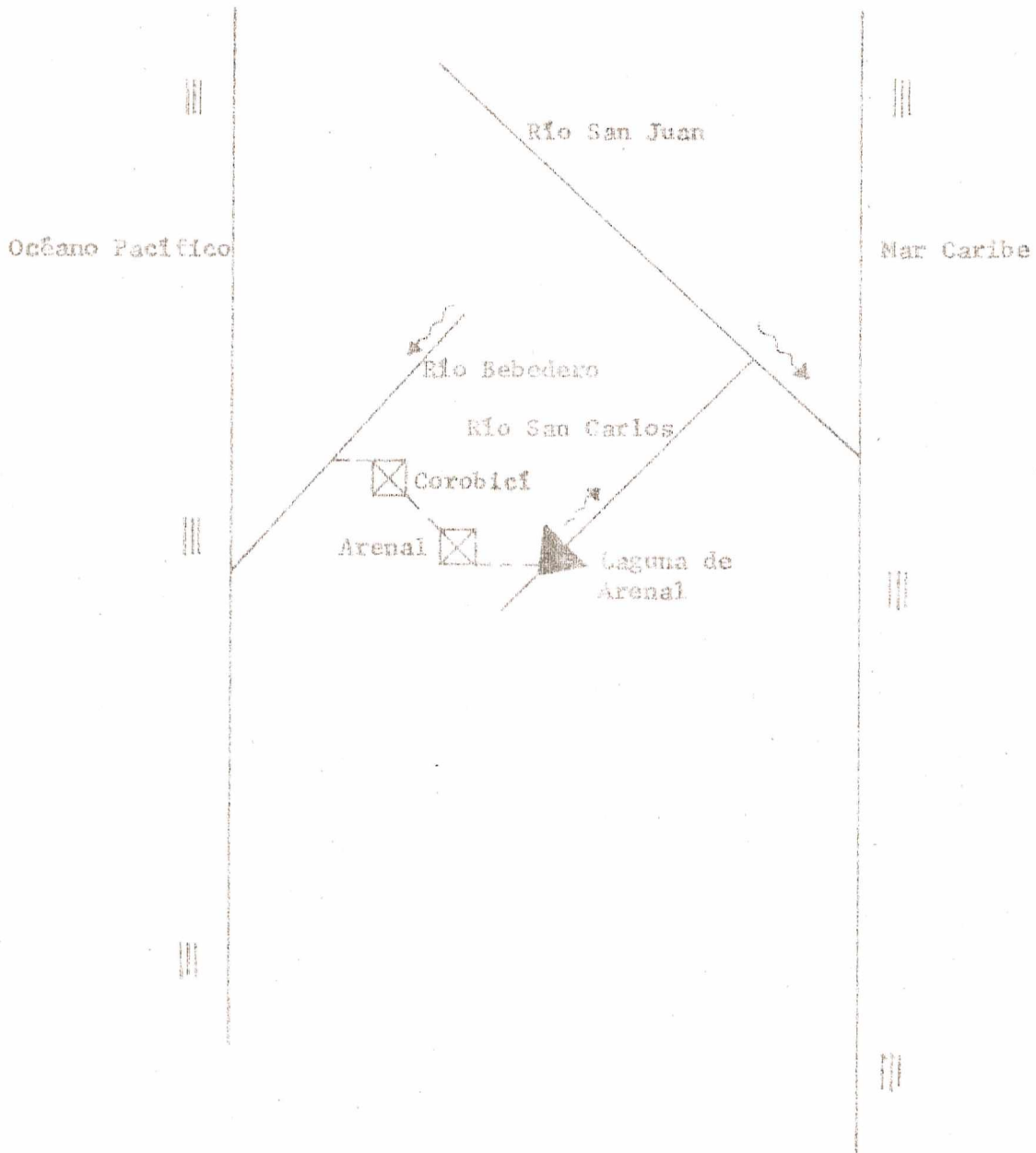


Figura 20

COSTA RICA: ESQUEMA DE APROVECHAMIENTOS HIDROELECTRICOS
EN LA CUENCA DEL RIO SIXAOLA

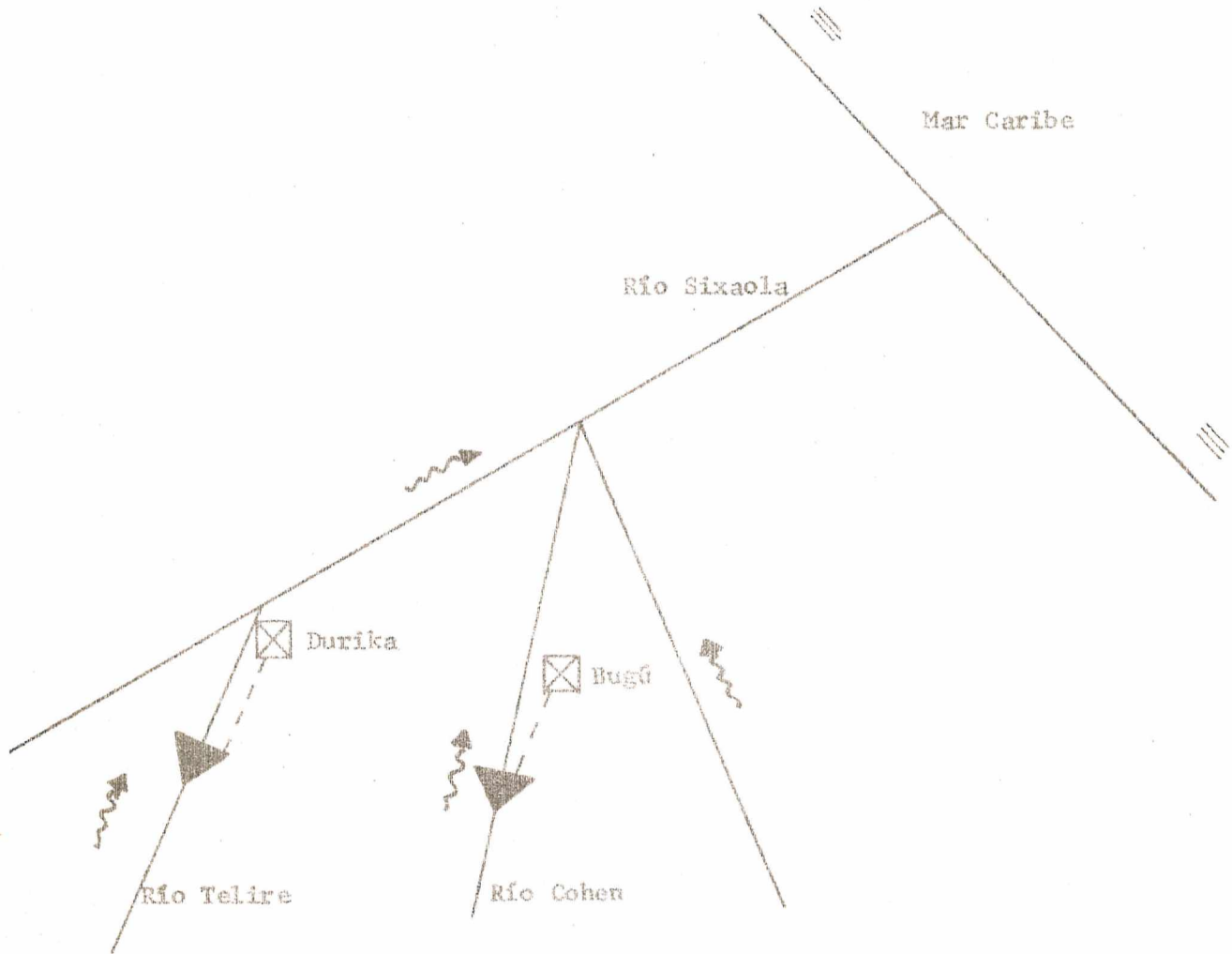


Figura 21

PANAMA; ESQUEMA DE APROVECHAMIENTOS HIDROELECTRICOS EN LAS CUENCAS DE LOS RIOS CHIRIQUI, TABASARA Y BAYANO

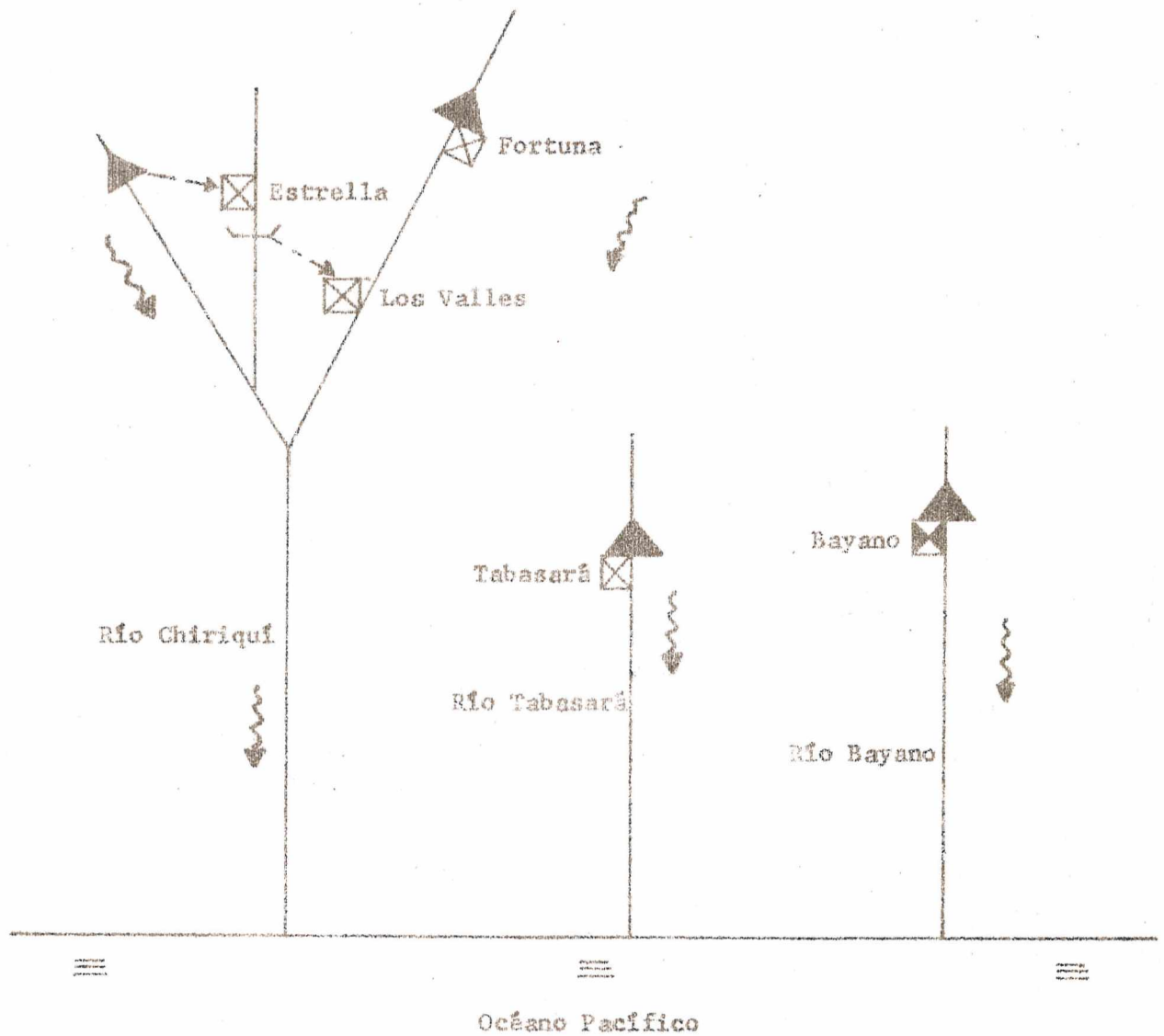
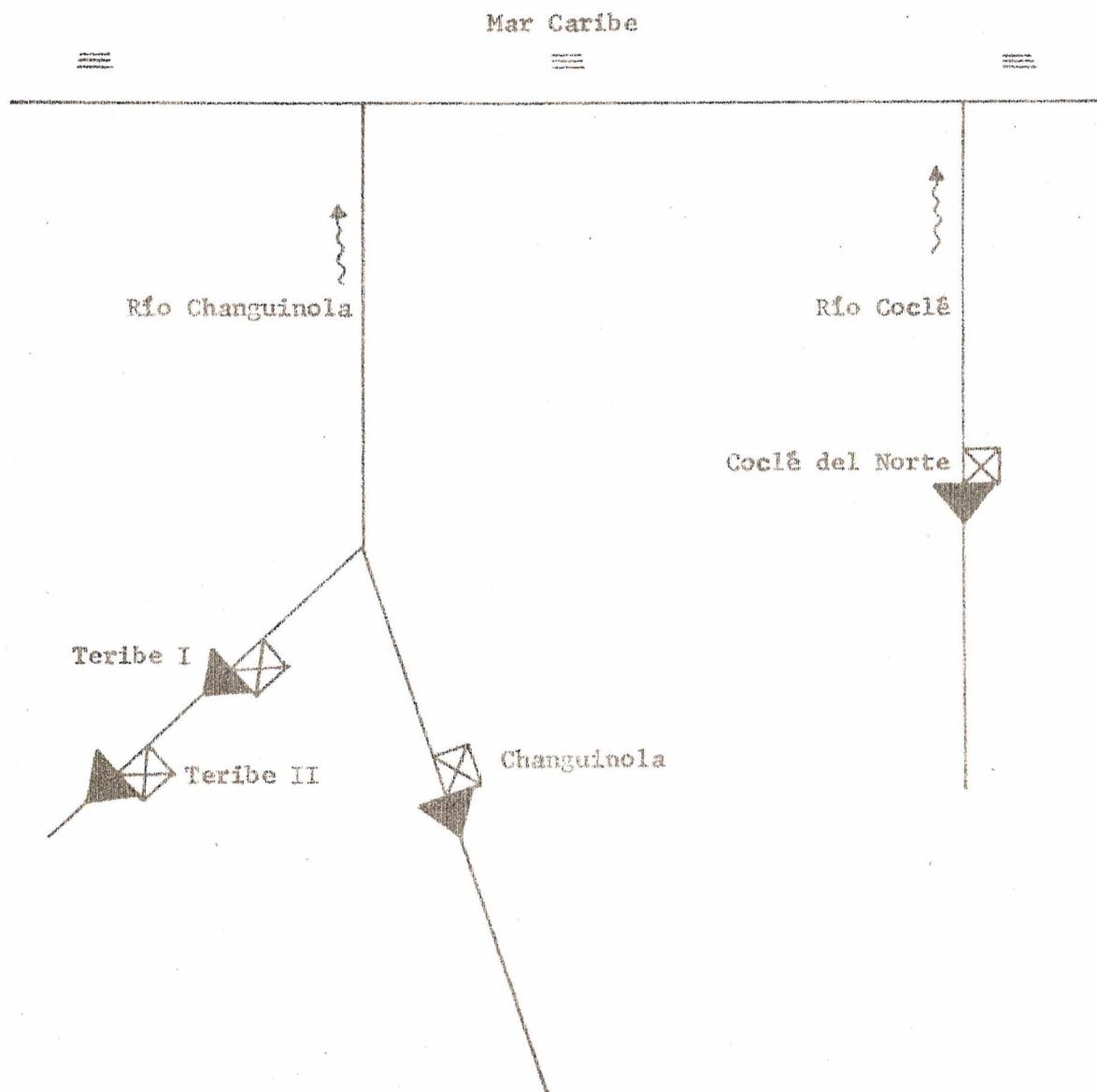


Figura 22

PANAMA; ESQUEMA DE APROVECHAMIENTOS HIDROELECTRICOS
EN LAS CUENCAS DE LOS RIOS CRANGUINOLA Y COCLE



Anexo 1

MODELO PARA LA GENERACION DE REGISTROS SINTETICOS DE ESCURRIMIENTOS
MENSUALES

(Memoria del programa de computación)

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 43. The forty-third section of the report
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 46. The forty-sixth section of the report
 47. The forty-seventh section of the report
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 66. The sixty-sixth section of the report
 67. The sixty-seventh section of the report
 68. The sixty-eighth section of the report
 69. The sixty-ninth section of the report
 70. The seventieth section of the report
 71. The seventy-first section of the report
 72. The seventy-second section of the report
 73. The seventy-third section of the report
 74. The seventy-fourth section of the report
 75. The seventy-fifth section of the report
 76. The seventy-sixth section of the report
 77. The seventy-seventh section of the report
 78. The seventy-eighth section of the report
 79. The seventy-ninth section of the report
 80. The eightieth section of the report
 81. The eighty-first section of the report
 82. The eighty-second section of the report
 83. The eighty-third section of the report
 84. The eighty-fourth section of the report
 85. The eighty-fifth section of the report
 86. The eighty-sixth section of the report
 87. The eighty-seventh section of the report
 88. The eighty-eighth section of the report
 89. The eighty-ninth section of the report
 90. The ninetieth section of the report
 91. The ninety-first section of the report
 92. The ninety-second section of the report
 93. The ninety-third section of the report
 94. The ninety-fourth section of the report
 95. The ninety-fifth section of the report
 96. The ninety-sixth section of the report
 97. The ninety-seventh section of the report
 98. The ninety-eighth section of the report
 99. The ninety-ninth section of the report
 100. The hundredth section of the report

INTRODUCCION

El uso de series de escurrimientos generadas con métodos estocásticos se ha convertido en una importante herramienta para la planeación, diseño y estudios sobre políticas de operación de sistemas de aprovechamiento hidráulico. Su uso se ha generalizado con el advenimiento de las grandes computadoras que hacen posible la evaluación estadística-aleatoria de los sistemas.

Las series generadas son especialmente útiles en aquellos casos en que las observaciones directas de los caudales cubren períodos de corta duración en los cuales resulta por una parte poco probable encontrar adecuadamente representados los períodos más críticos (húmedos y secos) y por la otra, constituyen muestras relativamente pobres para analizar toda la gama de casos posibles de operación.

En los últimos años se han hecho esfuerzos para desarrollar modelos más o menos sofisticados entre los cuales los que han mostrado mayor utilidad son los de la serie llamada autorregresivos que permiten tomar en consideración la correlación existente dentro del mismo año hidrológico entre los caudales.

El tratamiento estadístico de los datos y la generación de ellos mediante un modelo matemático, constituyen sin duda una de las herramientas más poderosas para el análisis de sistemas de aprovechamiento hidráulico. La mala interpretación de los conceptos estadísticos manejados es, frecuentemente, el mayor peligro que puede tener el uso de registros sintéticos. Es importante tomar en cuenta que no se está fabricando información; los números generados no hacen mejor las estimaciones sobre las características estadísticas del fenómeno físico que se está representando.

A continuación se presenta un modelo autorregresivo de primer orden, para generar registros sintéticos de escurrimiento mensual seguido del programa computacional, que permite generar las muestras. Por último, se presenta un ejemplo de aplicación del programa.

I. MODELO PROPUESTO

1. El modelo básico

Se parte de suponer que los escurrimientos mensuales quedan adecuadamente representados por un modelo autorregresivo del primer orden, esto es:

$$q_{i,j} = \bar{q}_i + b_i (q_{i-1,j} - \bar{q}_{i-1}) + e_{i,j} \quad (1)$$

Este es quizás el modelo utilizado más frecuentemente por diversos autores.^{1/} En la expresión (1):

q : volumen (o caudal) en el mes i del año j

\bar{q} : volumen que en promedio se presenta en el mes i

q_{i-1} : volumen en el mes $i-1$ del año j

\bar{q}_{i-1} : volumen promedio del mes $i-1$

b_i : coeficiente de regresión que representa el grado de relación entre los volúmenes que se presentan en el mes i y aquellos que ocurrieron en el mes $i-1$. De acuerdo con la teoría asociada al análisis de regresión lineal:

$$b_i = \frac{\sum_j (q_{i,j} - \bar{q}_i) (q_{i-1,j} - \bar{q}_{i-1})}{\sum_j (q_{i-1,j} - \bar{q}_{i-1})^2} \quad (2)$$

$e_{i,j}$: componente aleatorio en el mes i del año j

El modelo dado por la expresión (1) presupone que la distribución de frecuencias de los volúmenes mensuales es de tipo normal, lo que es necesario para que el análisis de regresión lineal sea correcto. La validez de esta hipótesis, ha sido el objeto de numerosos estudios, pues no siempre

^{1/} Una discusión más completa sobre el tema puede verse en: B. Fiering y B.B. Jackson, Synthetic Sheamflows, American Geophysical Union, Water Resources Monograph 1, 1971.

puede considerarse que los escurrimientos mensuales tienen una distribución de frecuencias del tipo normal. Se ha encontrado que en particular, los ríos de grandes pendientes presentan distribuciones de frecuencias asimétricas, esto es, el mayor número de escurrimientos tiende a concentrarse en un determinado rango de valores.

Tomando en cuenta lo anterior, diversos autores han propuesto transformaciones a los registros históricos, como paso previo a la utilización del modelo dado por la expresión (1). Aquí se presenta una alternativa de manejo de los datos históricos para trabajar con variables que tienen distribución normal.

2. La transformación lognormal

Sea la transformación del tipo:

$$X = \gamma + \delta g(q - \mu) \quad (3)$$

donde:

γ, δ, μ : parámetros a determinar

$g(\quad)$: una función determinada con variable independiente q

X : nueva variable

q : volúmenes mensuales de escurrimiento

Con respecto a la función $g(q - \mu)$ de la expresión (3), existen tres posibilidades alternativas:

$$g(q - \mu) = \log(q - \mu)$$

$$g(q - \mu) = \log \frac{(q - \mu)}{1 - (q - \mu)}$$

$$g(q - \mu) = \log \left((q - \mu) + \sqrt{(q - \mu)^2 + 1} \right)$$

La primera alternativa es la más simple en su manipulación y en adelante se hará referencia a ella como la transformación log-normal. La expresión (3) puede ahora escribirse:

$$X = \gamma + \delta \log(q - \mu) \quad (4)$$

/En la

En la expresión (4), tanto X como $\log(q - \mu)$ son variables aleatorias con distribución de frecuencias de tipo normal.

Existe una metodología apropiada^{2/} para determinar los valores de los parámetros γ , δ y μ , con base en las características estadísticas del registro histórico q . Esta metodología ha sido adaptada a un programa de computadora que se detalla en el próximo capítulo.

Con la nueva variable aleatoria definida por la expresión (4), el modelo para generar registros sintéticos es válido en su hipótesis fundamental. En la práctica, la generación de registros sintéticos se reduce a tres pasos generales:

- a) Ejecutar con el registro histórico la transformación dada por la expresión (4);
- b) Generar, mediante el modelo de la expresión (1), el registro sintético de la variable transformada;
- c) Aplicar la transformación inversa de la expresión (4) para obtener una muestra sintética de escurrimientos.

Con relación al último paso, la transformación inversa se expresa:

$$q = \exp\left(\frac{X - \gamma}{\delta}\right) + \mu \quad (5)$$

3. Consideraciones finales

La interpretación física del modelo dado por (1), puede expresarse como la consideración de dos partes que explican el escurrimiento que puede presentarse en un cierto mes: una parte determinista y otra aleatoria, esto es:

$$q_{i,j} = \underbrace{\bar{q}_i + b_i \cdot (q_{i-1,j} - \bar{q}_{i-1})}_{\text{determinista}} + \underbrace{e_{i,j}}_{\text{aleatoria}}$$

^{2/} M. G. Kendall, The Advanced Theory of Statistics, Charles Griffin and Co., 1966.

Con relación a la parte determinista, se está asegurando que los escurrimientos que se generen conserven dos características que se presenten en el registro histórico. La primera se refiere a su tendencia hacia un valor promedio (\bar{q}_i); la segunda se refiere a conservar, igual que en el registro histórico, la misma relación respecto al escurrimiento ocurrido en el mes anterior. Esta última condición es una medida de la "persistencia" de los escurrimientos, es decir, su tendencia a conservarse bajos o altos según lo ocurrido en meses anteriores.

Por lo que respecta a la parte aleatoria, se representa con ella la incertidumbre que deriva de una simplificación (la parte determinista) a un fenómeno complejo. La componente aleatoria asegura la existencia de valores extremos diferentes a los del registro histórico.

Por otro lado, la manera de comprobar que el modelo dado por la expresión (1) es adecuado, consiste en comparar estadísticamente (es decir, mediante alguna prueba convencional) que algunos parámetros de la muestra generada se aproximen a los correspondientes de la muestra histórica; en este caso los parámetros que se eligen son los promedios de los escurrimientos mensuales, su desviación típica y momento de tercer orden, así como el coeficiente de correlación entre el volumen escurrido en un mes y el escurrido en un mes anterior. De esta manera queda claro que la muestra sintética no va a mejorar la información histórica sobre valores promedio; en cambio, ofrecerá diversas posibilidades de secuencias de escurrimientos con períodos de valores altos y bajos distintos a los históricos. Esto último a su vez permitirá conocer la respuesta de los sistemas en estudio bajo una gama más amplia de series de escurrimientos igualmente posibles en estas condiciones, con lo cual es posible introducir a los análisis la idea de incertidumbre y riesgo.

II. PROGRAMA DE COMPUTADORA

De acuerdo con lo expuesto en el capítulo anterior, se diseñó un programa de computadora para generar muestras sintéticas de escurrimientos o gastos mensuales. A continuación se describe el programa.

1. Secuencia de cálculo

De acuerdo con el diagrama de bloques que se presenta en la figura 1, el programa sigue la siguiente secuencia de cálculos:

i) Lectura de datos: número de registros por analizar y para cada uno de ellos, el número de años de registro histórico, el número de años de registro sintético y los volúmenes (o caudales) mensuales;

ii) Cálculo e impresión de características estadísticas de los escurrimientos mensuales: media, variancia, desviación típica, momento de tercer orden, coeficiente de regresión (véase ecuación (2) de capítulo anterior) y coeficiente de correlación entre el volumen escurrido en un mes determinado y el escurrido en el mes anterior;

iii) Con base en una estimación de la asimetría de la función de distribución de frecuencias de los escurrimientos, se determina si los volúmenes en un mes determinado tienen o no distribución normal. Si no se obtiene distribución normal, se procede a evaluar los parámetros γ , δ y μ de la ecuación (4) del capítulo anterior;

iv) Una vez determinados los parámetros γ , δ y μ , cuando corresponda, se procede a efectuar la transformación dada por la expresión (4), esto es:

$$X_{i,j} = \gamma_i + \delta_i \log (q_{i,j} - \mu_i)$$

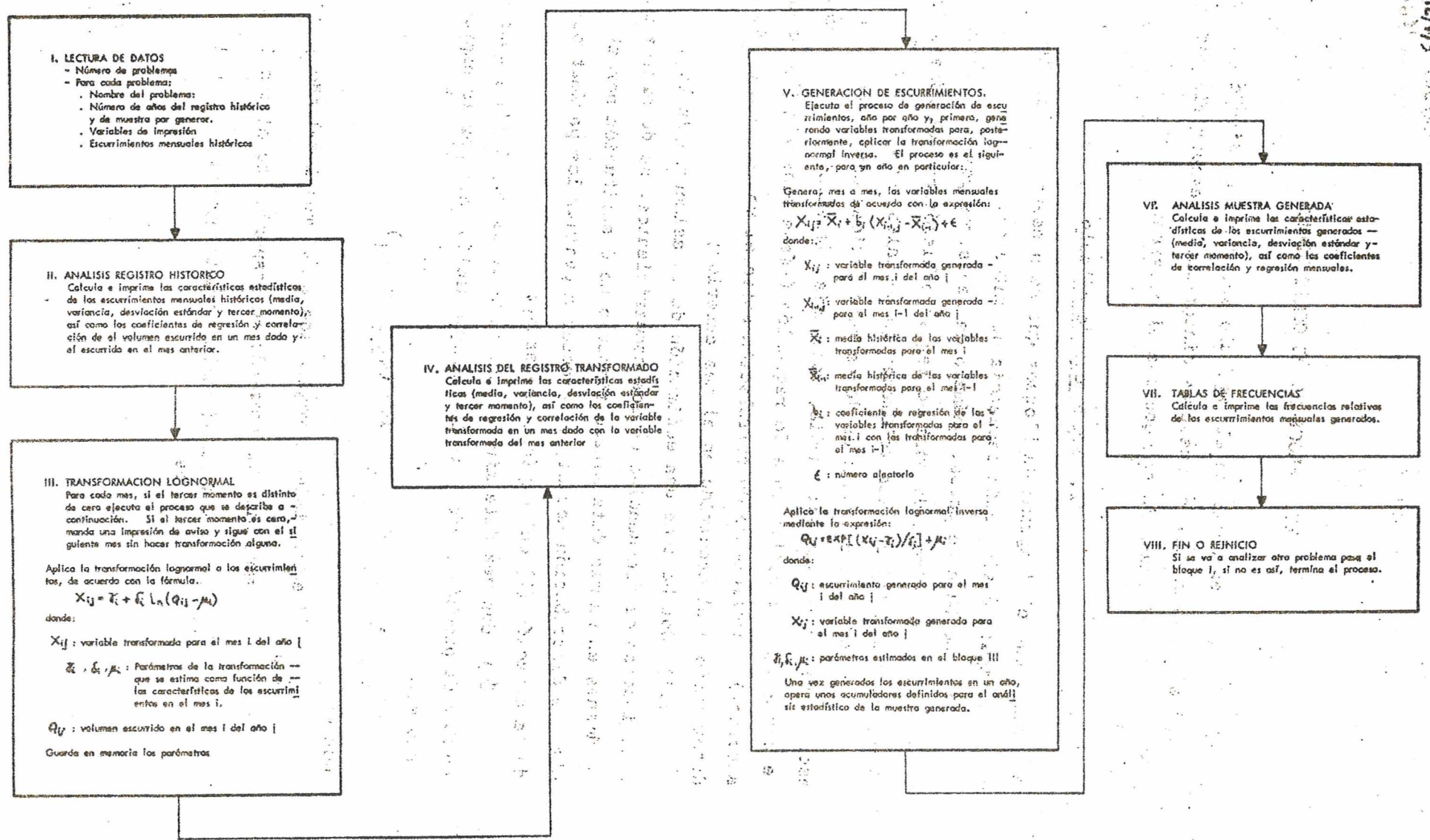
donde:

$q_{i,j}$: escurrimiento registrado en el mes i del año j

$X_{i,j}$: variable transformada correspondiente al mes i del año j

γ_i , δ_i , μ_i : parámetros de la transformación lognormal correspondiente al mes i

Figura 1
 DIAGRAMA DE BLOQUES DEL PROGRAMA DE COMPUTADORA



v) Se estiman las características estadísticas de las variables transformadas, incluyendo el coeficiente de regresión que será utilizado en el modelo de generación;

vi) Se determinan las componentes aleatorias y sus características estadísticas sustituyendo a partir de la expresión (1) y con base en la variable histórica transformada:

$$e_{i,j} = (X_{i,j} - \bar{X}_i) - b_i (X_{i-1,j} - \bar{X}_{i-1}) \quad (6)$$

donde:

$X_{i,j}$, $X_{i-1,j}$: la variable transformada de los meses i , $i-1$ del año j

\bar{X}_i , \bar{X}_{i-1} : la media de las variables transformada en los meses i , $i-1$

b_i : el coeficiente de regresión entre las variables transformadas en los meses i , $i-1$

$e_{i,j}$: componente aleatoria para el mes i del año j

Una vez obtenidas las $e_{i,j}$ puede demostrarse que su distribución de frecuencia será de tipo normal con media cero y variancia σ_{ei}^2 dada por:

$$\sigma_{ei}^2 = \sum_i e_{ij}^2 \quad (7)$$

vii) Se procede a generar muestras sintéticas de variables transformadas, aplicando el modelo propuesto en (1) de la siguiente manera:

$$X_{i,k} = \bar{X}_i + b_i (X_{i-1,k} - \bar{X}_{i-1}) + \sqrt{\sigma_{ei}^2} \epsilon_{i,k} \quad (8)$$

donde:

$\epsilon_{i,k}$: Es un número aleatorio con distribución normal de variancia unitaria

Al terminar de generar el año k ($k = 1$ hasta el número de años de la muestra sintética), se procede a obtener e imprimir los escurrimientos sintéticos para el año k , utilizando la transformación inversa dada en (5):

$$q_{i,k} = \exp \left(\frac{X_{i,k} - \gamma_i}{\delta} \right) + \mu_i \quad (9)$$

/viii) Al

viii) Al terminar de generar la muestra sintética se obtienen sus características estadísticas y su distribución de frecuencias a fin de verificar la validez del modelo empleado. La salida del programa permite listar o perforar en tarjetas los volúmenes mensuales generados;

ix) Si existe más de un registro histórico repite el procedimiento anterior, en caso contrario termina el programa.

2. Listado del programa

Se presenta a continuación un listado del programa de computadora. El lenguaje es FORTRAN IV.


```

PROGRAM SYNFLOW (INPUT,OUTPUT,TAPES=INPUT,TAPE6=OUTPUT)
C     GENERACION DE REGISTROS SINETICOS
C     LITR(I),I=1,20     TITULO DEL PROBLEMA
C     NUAN              NUMERO DE ANOS DEL REGISTRO HISTORICO
C     NUAN              NUMERO DE ANOS DEL REGISTRO HISTORICO
C     NAG              ANOS DESEADOS DE PREDICCION
C     LETR(I),I=1,5     ***ASIMMETARACULOS3
C     Q(I,J),I=1,12,J=1,NUAN  REGISTRO HISTORICO
C
DIMENSION LITR(20),LETR(10),Q(12,35)
DIMENSION GAM(12),DELT(12),AAA(12),AM3(12),VAL(12)
DIMENSION AC1(12),AC2(12),AC3(12),AC4(12)
COMMON /XA/Y(35)
COMMON /XB/D(4),T(3)
COMMON /XC/RSUP(12),QGM(12),PROBES(12,20),TRA(12,20)
COMMON/XE/QH(12),VAR(12),DST(12),C(12),R(12),QEN(35),QDIC(35)
READ(5,103) NUALT
DO 1000 NU=1,NUALT
IX=49431
CALL PAUSET(13)
READ (5,100) (LITR(I),I=1,20)
READ(5,101) NUAN,NAG,IPER
READ (5,100) (LETR(I),I=1,10)
READ (5,102) ((Q(I,J),I=1,12),J=1,NUAN)
QAAA = Q(12,NUAN)
AA=NUAN
AMAG = NAG
CALL ESTD1(NUAN,AA,Q)
WRITE (6,200) (LITR(I),I=1,20)
WRITE (6,201)
WRITE (6,202)
DO 1 J=1,NUAN
WRITE(6,203) J,(Q(I,J),I=1,12)
1 CONTINUE
WRITE (6,204)
WRITE (6,205) (I,QM(I),VAR(I),DST(I),C(I),R(I),I=1,12)
DO 8 I=1,12
AC1(I)=0.0
AC2(I)=0.0
AC3(I)=0.0
AC4(I)=0.0
8 RSUP(I) = 4. * DST(I) + QM(I)
CALL INTERV(0,AMAG)
DO 9 I=1,12
DO 9 K=1,20
9 PROBES(I,K)=0.0
C
C     TRANSFORMACION LOGNORMAL
C
WRITE (6,200) (LITR(K),K=1,20)
WRITE (6,207)
DO 16 I=1,12
WRITE (6,101) I
C
C     DETERMINA PARAMETROS. SI EL TERCER MOMENTO ES NEGATIVO, CALCULA LOS
C     PARAMETROS INVIRTIENDO EL SIGNO DE LA VARIABLE A TRANSFORMAR, SI EL
C     TERCER MOMENTO ES CERO, SE CONSIDERA QUE LA VARIABLE TIENE DISTRIBU

```

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```

C      CION NORMAL.
C
      DO 10 J=1,NUAN
10     Y(J) = Q(I,J)
        CALL TMRO(NUAN,S1,S2,S3)
        WRITE (6,208) S1,S2,S3
        AM3(I)=S3
        IF(S3) 11,12,13
11     S1 = -S1
        S3 = -S3
        WRITE (6,209) LETR(9),S1,S2,S3
        GO TO 13
12     WRITE (6,209) LETR(10)
        GO TO 16
13     BETA = S3**2 / S2**3
        WRITE (6,209) LETR(2),BETA
        BETA = SQRT(BETA)
        WRITE (6,209) LETR(3),BETA
        D(1) = 1.0
        D(2) = 0.0
        D(3) = 3.0
        D(4) = - BETA
        CALL CUBIC (XI)
        WRITE (6,209) LETR(4),T,XI
        IF (T(1)) 14,14,15
14     WRITE (6,209) LETR(1)
        GO TO 16
15     ANU = S1 - SQRT(S2)/T(1)
        DELTA = SQRT(1./(2.*ALOG(SQRT(T(1)**2+1.))))
        GAMA = SQRT(S2)/(T(1)*SQRT(T(1)**2+1.))
        GAMA = -DELTA*ALOG(GAMA)
        WRITE (6,209) LETR(5),GAMA,DELTA,ANU
        AAA(I) = ANU
        DELT(I) = DELTA
        GAM(I) = GAMA
16     CONTINUE
C
C      TRANSFORMA Q(I,J) EN Q (I,J) = GAM(I) + DELT(I)*ALOG(Q(I,J)-AAA(I))
C
      WRITE (6,200) (LETR(K),K=1,20)
      WRITE (6,217)
      DO 19 I=1,12
        IF(AM3(I)) 17,19,17
17     DO 18 J=1,NUAN
          Q(I,J) = GAM(I) + DELT(I) * ALOG(Q(I,J) - AAA(I))
18     CONTINUE
19     CONTINUE
        CALL ESTD1(NUAN,AN,Q)
        DO 20 J= 1,NUAN
          WRITE (6,203) J,(Q(I,J),I=1,12)
20     CONTINUE
        WRITE (6,204)
        WRITE (6,205) (I,QM(I),VAR(I),DST(I),C(I),R(I),I=1,12)
C
C
C      DETERMINA LAS CARACTERISTICAS DE LAS COMPONENTES ALEATORIAS
C

```



```

WRITE (6,200) (LITR(K),K=1,20)
WRITE (6,219)
DO 27 I=1,12
IF(I-1) 22,22,24
22 DO 23 J=2,NUAN
Y(J-1) = (Q(I,J)-QM(I)) - C(I)*(Q(12,J-1)-QM(12))
23 CONTINUE
VAL = NUAN-1
CALL TMPO(VAL,S1,S2,S3)
GO TO 26
24 DO 25 J=1,NUAN
Y(J) = (Q(I,J)-QM(I)) - C(I)*(Q(I-1,J)-QM(I-1))
25 CONTINUE
CALL TMPO(NUAN,S1,S2,S3)
26 WRITE (6,218) I,S1,S2,S3
VAL(I) = SQRT(S2)
27 CONTINUE

```

C
C
C

GENERA VARIABLES Y REALIZA TRANSFORMACIONES INVERSAS.

```

QGA = Q(12,NUAN) - QM(12)
WRITE (6,200) (LITR(K),K=1,20)
WRITE (6,210)
WRITE (6,202)
DO 38 J=1,NUAN
DO 36 I=1,12
S = VAL(I)
CALL RAND2(IX,S,ALEA)
QGT = QM(I) + C(I)*QGA + ALEA
IF(AM3(I)) 29,33,29
29 QGO = EXP((QGT-QAM(I))/DELT(I)) + AAA(I)
30 IF(QGO) 31,32,32
31 QGO = 0.0
QGT = GAM(I) + DELT(I) * ALOG(-AAA(I))
32 GO TO 35
33 QGO = QGT
IF(QGO) 34,35,35
34 QGO = 0.0
QGT = 0.
35 QGM(I) = QGO
AC1(I) = AC1(I) + QGO
AC2(I) = AC2(I) + QGO * QGO
AC3(I) = AC3(I) + QGO * QGO * QGO
AC4(I) = AC4(I) + QGO * QGAA
QGAA = QGO
QGA = QGT - QM(I)
36 CONTINUE
WRITE (6,203) J,(QGM(LI),LI=1,12)
CALL INTERV(2,ANAG)
38 CONTINUE
WRITE (6,200) (LITR(K),K=1,20)
WRITE (6,211)

```

C
C
C

CALCULA ESTADISTICAS DE VARIABLES GENERADAS

```

WRITE (6,204)
DO 39 I=1,12

```


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```

QM(I) = AC1(I) / ANAG
VAR(I) = (AC2(I) - ANAG*QM(I)**2) / (ANAG - 1.)
DST(I) = SQRT(VAR(I))
AM3(I) = (AC3(I) - 3.*QM(I)*AC2(I) + 2.*ANAG*QM(I)**3)
AM3(I) = (AM3(I) * ANAG) / ((ANAG-1.)*(ANAG-2.))
39 CONTINUE
C(I) = (AC4(I) - ANAG*QM(I)*QM(12)) / (AC2(12) - ANAG*QM(12)**2)
R(I) = AC4(I) - ANAG*QM(I)*QM(12)
R(I) = R(I)/SQRT((AC2(1)-ANAG*QM(1)**2)*(AC2(12)-ANAG*QM(12)**2))
DO 40 I=2,12
C(I) = (AC4(I)-ANAG*QM(I)*QM(I-1))/(AC2(I-1)-ANAG*QM(I-1)**2)
R(I) = AC4(I) - ANAG*QM(I)*QM(I-1)
R(I)=R(I)/SQRT((AC2(I)-ANAG*QM(I)**2)*(AC2(I-1)-ANAG*QM(I-1)**2))
40 CONTINUE
WRITE (6,205) (I,QM(I),VAR(I),DST(I),C(I),R(I),I=1,12)
WRITE (6,212) (LITR(K),K=1,20)
WRITE (6,213)
WRITE (6,214) ((TRA(I,J),PROBES(I,J),I=1,6),J=1,20)
WRITE (6,215)
WRITE (6,213)
WRITE (6,214) ((TRA(I,J),PROBES(I,J),I=7,12),J=1,20)
1000 CONTINUE
100 FORMAT(20A4)
101 FORMAT(3I5)
102 FORMAT(12F6.1)
103 FORMAT(I5)
200 FORMAT(1H1,25X,20A4)
201 FORMAT(50X,*VALORES REGISTRADOS*/42X,*VOLUMENES MENSUALES EN MILLO
INES DE M3*//)
202 FORMAT(2X,*ANO*,3X,*ENERO*,3X,*FERRERO*,3X,*MARZO*,4X,*ABRIL*,5X,*
MAYO*,4X,*JUNIO*,4X,*JULIO*,4X,*AGOSTO*,1X,*SEPTIEM.*,2X,*OCTOBRE*
2,2X,*NOVIEN.*,2X,*DICIEM.*//)
203 FORMAT(1X,I4,12(2X,F7.1))
204 FORMAT(//19X,*MES*,7X,*MEDIA*,9X,*VARIANCIA*,6X,*DESV. EST.*,6X,*C
10EF. REGR.*,4X,*COEF. CORREL.*//)
205 FORMAT(18X,I4,5E16.7)
207 FORMAT(35X,*PARAMETROS DE LA TRANSFORMACION LOG-NORMAL*//)
208 FORMAT(10X,3E15.7)
209 FORMAT(5X,A4,6E14.7)
210 FORMAT(50X,*VOLUMENES GENERADOS*//)
211 FORMAT(32X,*CARACTERISTICAS ESTADISTICAS DE LOS VOLUMENES GENERADO
1S*//)
212 FORMAT(1H1,25X,20A4//44X,*PROBABILIDADES DE ESCURRIMIENTOS*//7X,*
1ENERO*,13X,*FEBRERO*,13X,*MARZO*,14X,*ABRIL*,14X,*MAYO*,15X,*JUNIO
2*)
213 FORMAT(2X,*HASTA*,5X,*PROB.*,4X,*HASTA*,5X,*PROB.*,4X,*HASTA*,5X,*
1PROB.*,4X,*HASTA*,5X,*PROB.*,4X,*HASTA*,5X,*PROB.*,4X,*HASTA*,5X,*
2PROB.*//)
214 FORMAT(6(F7.1,5X,F7.4))
215 FORMAT(/7X,*JULIO*,14X,*AGOSTO*,10X,*SEPTIEMBRE*,11X,*OCTURRE*,11X
1,*NOVIEMBRE*,10X,*DICIEMBRE*)
216 FORMAT(12F6.1,4X,I4)
217 FORMAT(50X,*VALORES TRANSFORMADOS*///,2X,*AND*,3X,*ENERO*,3X,*FEBR
1ERO*,4X,*MARZO*,4X,*ABRIL*,5X,*MAYO*,4X,*JUNIO*,4X,*JULIO*,4X,*AGO
2STO*,1X,*SEPTIEM.*,2X,*OCTURRE*,2X,*NOVIEMBRE*,2X,*DICIEM.*//)
218 FORMAT(5X,*MES*,I4,3X,*MEDIA *=*,E15.5,2X,*VARIANCIA *=*,E15.5,2X,
1*TER.MOM. *=*,E15.5)

```

219 FORMT(15,*CARACTERISTICAS DE LAS COMPONENTES ALEATORIAS*,//)
 END

REFERENCE MAP (R=1)

TYPE	RELOCATION						
REAL	ARRAY		6647	AC1	REAL	ARRAY	
REAL	ARRAY		6677	AC3	REAL	ARRAY	
REAL	ARRAY		5645	ALEA	REAL		
REAL	ARRAY		5627	AN	REAL		
REAL			5637	ANU	REAL		
REAL			44	C	REAL	ARRAY	XE
REAL	ARRAY	XB	6567	DELT	REAL	ARRAY	
REAL			30	DST	REAL	ARRAY	XE
REAL	ARRAY		5641	GAMA	REAL		
INTEGER			5624	IPER	INTEGER		
INTEGER			5625	J	INTEGER		
INTEGER			5675	LETR	INTEGER	ARRAY	
INTEGER			5651	LITR	INTEGER	ARRAY	
INTEGER			5642	NAL	INTEGER		
INTEGER			5616	MUALT	INTEGER		
INTEGER			30	PROBES	REAL	ARRAY	XC
REAL	ARRAY		137	ODIC	REAL	ARRAY	XE
REAL	ARRAY	XE	5643	OGA	REAL		
REAL			14	OGF	REAL	ARRAY	XC
REAL			5646	OGT	REAL		
REAL	ARRAY	XE	60	R	REAL	ARRAY	XE
REAL	ARRAY	XC	5644	S	REAL		
REAL			5633	S2	REAL		
REAL			4	T	REAL	ARRAY	XB
REAL	ARRAY	XC	6633	VAL	REAL	ARRAY	
REAL	ARRAY	XE	5636	XI	REAL		
REAL	ARRAY	XA					

MODE

2043 OUTPUT

0 TAPES

FMT

2043

TYPE	ARGS				
REAL	1	LIBRARY	CURIC		1
	3		EXP	REAL	1
	2		RAND2		3
	1		SQRT	REAL	1
	4				LIBRARY

0	8			0	9
0	11	INACTIVE		4271	12
0	14	INACTIVE		4320	15
0	17	INACTIVE		0	18
0	20			0	22

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```

SUBROUTINE ESTD1(N,AN,V)
DIMENSION SVV(12),V(12,35),SV(12)
COMMON/XE/VM(12),VR(12),DS(12),CR(12),CC(12),VE(35),VD(35)
DO 2 I=1,12
VM(I)=0.0
DO 1 J=1,N
1 VM(I)=VM(I)+V(I,J)
2 VM(I)=VM(I)/AN
DO 4 I=1,12
SV(I)=0.0
DO 3 J=1,N
3 SV(I)=SV(I)+(V(I,J)-VM(I))**2
VR(I)=SV(I)/(AN-1.)
4 DS(I)=SORT(VR(I))
SVD=0.0
SVE=0.0
SVED=0.0
DO 5 I=2,12
SVV(I)=0.0
DO 5 J=1,N
SVV(I)=SVV(I)+(V(I,J)-VM(I))*(V(I-1,J)-VM(I-1))
5 CONTINUE
DO 6 I=2,12
CR(I)=SVV(I)/SV(I-1)
6 CC(I)=SVV(I)/SORT(SV(I)*SV(I-1))
VME=(VM(1)*AN-V(1,1))/(AN-1.)
VMD=(VM(12)*AN-V(12,N))/(AN-1.)
DO 7 J=1,N
VE(J)=V(1,J)-VME
VD(J)=V(12,J)-VMD
SVE=SVE+VE(J)**2
7 SVD=SVD+VD(J)**2
SVE=SVE-VE(1)**2
SVD=SVD-VD(N)**2
DO 8 J=2,N
8 SVED=SVED+VE(J)*VD(J-1)
CR(1)=SVED/SVD
CC(1)=SVED/SORT(SVD*SVE)
RETURN
END

```

REFERENCE MAP (R=1)

TYPE	RELOCATION					
REAL		F.P.	60	CC	REAL	ARRAY XE
REAL	ARRAY	XE	30	DS	REAL	ARRAY XE
INTEGER			176	J	INTEGER	
INTEGER		F.P.	220	SV	REAL	ARRAY
REAL			200	SVE	REAL	
REAL			204	SVV	REAL	ARRAY


```

SUBROUTINE TMRO(ND,S1,S2,S3)
COMMON /XA/A(35)
S1 = 0
S2 = 0
S3 = 0
DO 10 I=1,ND
10 S1=S1+A(I)
S1=S1/ND
DO 11 I=1,ND
S2 = S2 + (A(I) - S1) ** 2
11 S3 = S3 + (A(I) - S1) ** 3
S3 = S3 * ND / ((ND-1.)*(ND-2.))
S2 = S2 / (ND-1.)
RETURN
END
    
```

REFERENCE MAP (P=1)

TYPE	PELOCATION				
REAL	ARRAY	XA	45	T	INTEGER
INTEGER		F.P.	0	S1	REAL F.P.
REAL		F.P.	0	S3	REAL F.P.

0 11

INDEX	FROM-TO	LENGTH	PROPERTIES
I	6 7	3H	OPT
I	9 11	5H	OPT

LENGTH
35

MON LENGTH	46B	3B
	43B	35

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```

SUBROUTINE CUBIC(XI)
COMMON /X5/A(4),XR(3)
COMMON /XD/A0(3)
IPATH=2
EX=1./3.
IF(A(4)) 1006,1004,1006
1004 XR(1)=0.
GO TO 1034
1006 A2=A(1)*A(1)
Q=(27.*A2*A(4)-9.*A(1)*A(2)*A(3)+2.*A(2)**3)/(54.*A2*A(1))
IF(Q) 1010,1008,1014
1008 Z=0.
GO TO 1032
1010 Q=-Q
IPATH= 1
1014 P=(3.*A(1)*A(3)-A(2)*A(2))/(9.*A2)
ARG=P*P*P+Q*Q
IF(ARG) 1016,1018,1020
1016 Z=-2.*SORT (-P)*COS (ATAN (SORT (-ARG)/Q)/3.)
GO TO 1028
1018 Z=-2.*Q**EX
GO TO 1028
1020 SARG=SORT (ARG)
IF(P) 1022,1024,1026
1022 Z= -(Q+SARG)**EX-(Q-SARG)**EX
GO TO 1028
1024 Z=-(2.*Q)**EX
GO TO 1028
1026 Z=(SARG-Q)**EX-(SARG+Q)**EX
1028 GO TO (1030,1032), IPATH
1030 Z=-Z
1032 XR(1)= (3.*A(1)*Z-A(2))/(3.*A(1))
1034 A0(1)= A(1)
A0(2)= A(2)+ XR(1)*A(1)
A0(3)= A(3)+ XR(1)*A0(2)
CALL QUAD(XR(2),XR(3),XI)
RETURN
END

```

DETAILS DIAGNOSIS OF PROBLEM

AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED G

REFERENCE MAP (R=1)

```

SUBROUTINE QUAD(XR1,XR2,XI)
COMMON /XD/ A(3)
X1=-A(2)/(2.*A(1))
DISC=X1*X1-A(3)/A(1)
IF(DISC) 10,20,20
10 X2=SQRT (-DISC)
XR1=X1
XR2=X1
XI=X2
GO TO 30
20 X =SQRT (DISC)
XR1=X1+X2
XR2=X1-X2
XI=0.
30 RETURN
END
    
```

REFERENCE MAP (R=1)

TYPE	RELOCATION				
REAL	ARRAY	XD	30	DISC	REAL
REAL			0	XI	REAL
REAL		F.P.	0	XR2	REAL
REAL			31	X2	REAL

F.P.

TYPE	ARGS
REAL	1 LIBRARY

INACTIVE 17 20 25 30

LENGTH
3

MON LENGTH 33B 27
3B 3

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```

SUBROUTINE INTERV(I,ANAG)
COMMON /XC/RSUP(12),OGM(12),PROBES(12,20),TRA(12,20)
IF(I)200,200,204
200 DO 202 J=1,12
    DO 202 K=1,20
202 TRA(J,K)=K*0.05*RSUP(J)
    GO TO 212
204 DO 210 J=1,12
    DO 208 K=1,20
    IF(OGM(J)-TRA(J,K))206,206,208
208 CONTINUE
    GO TO 210
206 PROBES(J,K)=PROBES(J,K)+1./ANAG
210 CONTINUE
212 RETURN
    END
    
```

REFERENCE MAP (R=1)

TYPE	RELOCATION						
REAL	F.P.		0	I	INTERGER		F.P.
INTEGER			66	K	INTERGER		
REAL	ARRAY XC		14	OGM	REAL	ARRAY	XC
REAL	ARRAY XC		410	TRA	REAL	ARRAY	XC

INACTIVE	0	202	36	204
	0	208	55	210

INDEX	FROM-TO	LENGTH	PROPERTIES
J	4 6	16B	NOT INNER
K	5 6	4B	OPT
J	8 14	21B	NOT INNER
K	9 11	7B	OPT EXITS

LENGTH
504

MON LENGTH 73B 59
 770B 504

SUBROUTINE RAND2(IX,S,V)

A=0.0

DO 50 I=1,12

Y=RANF(13)

50 A=A+Y

V=(A-6.)*S

RETURN

END

REFERENCE MAP (R=1)

TYPE	RELOCATION				
REAL			25	I	INTEGER
INTEGER	*UNUSED	F.P.	0	S	REAL
REAL		F.P.	26	Y	REAL

TYPE	ARGS	
REAL	1	INTRIN

INDEX	FROM-TO	LENGTH	PROPERTIES
I	3 5	58	OPT

278 23

3. Limitaciones

El programa puede operar con registros históricos de hasta 35 años. No existen restricciones de memoria en cuanto al tamaño de la muestra sintética por generar. En caso de registros históricos de más de 35 años sería necesario:

- i) En la primera instrucción de DIMENSION cambiar Q (12, 35) por Q (12, N) donde N es el tamaño de la muestra histórica que se desee;
- ii) En el COMMON/XE/..., cambiar QEN (35) y QDIC (35) por QEN (N) y QDIC (N), donde N es el número de años que se desee.

4. Entrada de datos

De acuerdo con el listado que se presentó en el numeral 2., los datos de entrada y su respectivo formato son los siguientes:

- i) Primera tarjeta general. Lee NUALT (con formato I5), que es el número de problemas que se van a estudiar;
- ii) Para cada problema lee las siguientes tarjetas:
 - Primera tarjeta del problema. Lee LITR(I), I=1,20 (con formato 20A4), que es la identificación del problema hasta con 80 caracteres.
 - Segunda tarjeta del problema. Lee NUAN, NAG, IPER (con formato 3I5), que son respectivamente el número de años del registro histórico, el número de años del registro sintético y una variable de opción: IPER = 0 si se desean tarjetas perforadas con los escurrimientos mensuales, IPER = 0 en caso contrario.
 - Tercera tarjeta del problema. Lee LETR(I), I = 1,10 (con formato 10 A4), que son variables de impresión, comunes en todos los problemas:
LETR (1) = ****
LETR (2) = ASIM
LETR (3) = BETA
LETR (4) = RACU
LETR (5) = LØS3
LETR (6) = ****

/LETR (7)

LETR (7) = ****

LETR (8) = ****

LETR (9) = NEGA

LETR (10) = NØRM

- Sigüientes tarjetas del problema. Lee Q (I, J), I = 1, 12 y J = 1, NUAN (con formato 12F6.1), que son los volúmenes escurridos en cada mes i de cada año j. Cada tarjeta contiene un año con los 8 últimos caracteres disponibles para identificación.

III. EJEMPLO DE APLICACION

1. El problema y su entrada al programa

Como ejemplo de aplicación del programa, se presenta el estudio de un solo problema. Se seleccionó el registro en la estación Corriente Lira en Nicaragua. Esta estación contaba con 15 años de registro histórico.

En la figura 2, se presenta la codificación necesaria para los datos de entrada. De acuerdo a dicha figura:

NUALT	=	1 (número de problemas)
NUAN	=	15 (años de registro histórico)
NAG	=	500 (años de la muestra sintética)
IPER	=	0 (no se desean obtener tarjetas perforadas)

2. Los resultados del programa

Los resultados que presenta el programa son, por orden cronológico, los siguientes:

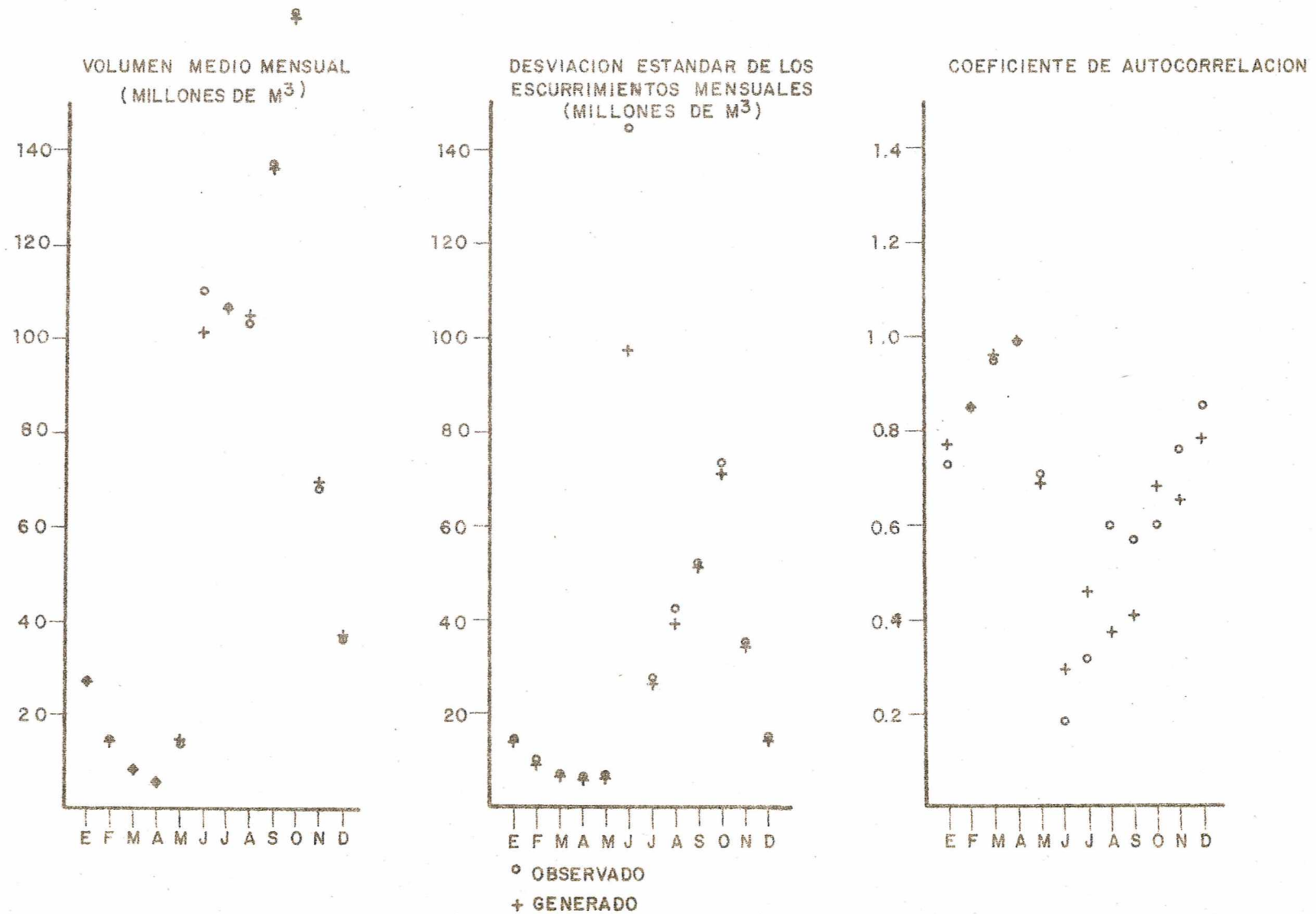
- a) El registro histórico y sus características estadísticas. (Véase el cuadro 1.)
- b) Los parámetros de la distribución log-normal correspondiente a cada mes. (Véase el cuadro 2.)
- c) El registro de variables transformadas y sus características estadísticas. (Véase el cuadro 3.)
- d) Las características estadísticas de las componentes aleatorias. (Véase el cuadro 4.)
- e) El registro sintético. (Véase el cuadro 5.)
- f) Las características estadísticas del registro sintético. (Véase el cuadro 6.)
- g) La distribución de frecuencias de los escurrimientos mensuales generados. (Véase el cuadro 7.)

3. Verificación del modelo

La verificación del modelo utilizado para generar muestras sintéticas se realizó mediante diversas pruebas estadísticas (básicamente Kolmogorf y X^2), verificando que las características estadísticas de los escurrimientos sintéticos (media y variancia) sean estadísticamente iguales a las correspondientes características de los volúmenes históricos. Se verifica asimismo si el modelo conserva las características de correlación entre escurrimiento de un mes y el anterior. En forma cualitativa, en la figura 3 se presentan comparaciones entre las características estadísticas del registro histórico y las de una muestra de 500 años; los resultados, como puede apreciarse en la figura 2, son satisfactorios.

/Figura 3

FIGURA 3. COMPARACION ESTADISTICA ENTRE EL REGISTRO HISTORICO Y EL REGISTRO GENERADO



Cuadro 3

MINISTERIO INTERIOR Y COMERCIO EXTERNO (NICARAGUA)
DEPARTAMENTO DE LA TRANSFORMACION LIGERA-NORMAL

1	NEQA	272667E+02	190352E+03	117391E+04
	ASIA	19767E+00		
	RETA	466955E+00		
	ACQ	187930E+00	77927E+01	173679E+01
2	LOSA	307981E+02	629762E+01	120949E+03
	ASIA	146000E+02	995408E+02	673951E+03
	RETA	670994E+00		
	ACQ	22529E+00	111264E+00	174279E+01
3	LOSA	171875E+02	454868E+01	302355E+02
	ASIA	846847E+01	541218E+02	406537E+03
	RETA	192402E+01		
	ACQ	328405E+00	164254E+00	178526E+01
4	LOSA	954191E+01	312374E+01	139289E+02
	ASIA	586647E+01	428310E+02	376642E+03
	RETA	184547E+01		
	ACQ	211387E+00	211387E+00	172098E+01
5	LOSA	654423E+01	246825E+01	962934E+01
	ASIA	146000E+02	416399E+02	245808E+03
	RETA	881479E+00		
	ACQ	922773E+00	149341E+00	175126E+01
6	LOSA	163473E+02	342870E+01	699036E+01
	ASIA	110400E+03	209161E+05	823248E+07
	RETA	911857E+01		
	ACQ	302147E+01	414617E+00	416047E+00
7	LOSA	678101E+01	133820E+01	438670E+02
	ASIA	166400E+03	751143E+03	160416E+05
	RETA	687452E+00		
	ACQ	179272E+00	127136E+00	174593E+01
8	LOSA	162741E+02	396127E+01	138186E+01
	ASIA	138000E+03	177331E+04	144261E+00
	RETA	371207E+01		
	ACQ	193104E+01	289525E+00	180317E+01
9	LOSA	470079E+01	185288E+01	319931E+02
	ASIA	174400E+03	268636E+04	118250E+00
	RETA	729741E+00		
	ACQ	844274E+00	139208E+00	174866E+01
10	LOSA	136695E+02	469974E+01	709829E+02
	ASIA	176400E+03	537021E+04	310713E+04
	RETA	623371E+00		
	ACQ	289300E+00	121762E+00	174634E+01
11	LOSA	221724E+02	394680E+01	104534E+03
	ASIA	696647E+02	120012E+04	101390E+05
	RETA	594817E+01		
	ACQ	293744E+01	349626E+00	103478E+01
12	LOSA	547324E+01	159040E+01	189059E+02
	ASIA	366567E+02	228692E+03	533163E+04
	RETA	247264E+01		
	ACQ	477684E+00	239622E+00	178079E+01
	LOSA	239419E+01	220752E+01	480378E+01

1	MEIA =	*.74124E-01	VARIANCIA =	*.13576E+00	TER.MOM. =	*.17639E-01
2	MEIA =	*.52106E-14	VARIANCIA =	*.23233E+00	TER.MOM. =	*.14060E-01
3	MEIA =	*.18940E-14	VARIANCIA =	*.51048E-01	TER.MOM. =	*.44393E-02
4	MEIA =	*.17171E-14	VARIANCIA =	*.11414E-01	TER.MOM. =	*.41343E-03
5	MEIA =	*.94739E-15	VARIANCIA =	*.51835E+00	TER.MOM. =	*.20768E+00
6	MEIA =	*.94739E-15	VARIANCIA =	*.49641E+00	TER.MOM. =	*.69386E+00
7	MEIA =	*.17764E-15	VARIANCIA =	*.73457E+00	TER.MOM. =	*.26467E+00
8	MEIA =	*.47370E-15	VARIANCIA =	*.75531E+00	TER.MOM. =	*.35545E+00
9	MEIA =	*.35527E-14	VARIANCIA =	*.00376E+00	TER.MOM. =	*.90078E+00
10	MEIA =	0.	VARIANCIA =	*.51778E+00	TER.MOM. =	*.19186E-01
11	MEIA =	*.26053E-14	VARIANCIA =	*.46917E+00	TER.MOM. =	*.26633E+00
12	MEIA =	*.20422E-14	VARIANCIA =	*.34533E+00	TER.MOM. =	*.96630E-01

REGISTRO SIMPLIFICADO EM CORRIENTE LIRA (NICARAGUA)
 CARACTERÍSTICAS DE LAS COMPONENTES ALTERNATIVAS

Quadro 4

ANO	ENERO	FEBRERO	MARZO	ABRIL
1	29.7	20.4	9.9	5.9
2	22.1	13.1	5.3	2.3
3	13.8	8.7	3.7	1.6
4	39.8	20.4	12.0	8.0
5	34.9	12.9	6.8	4.1
6	48.4	25.6	20.3	15.1
7	33.0	23.6	15.0	11.2
8	7.0	.5	0.0	0.0
9	25.6	12.8	0.8	1.4
10	16.2	2.0	.4	0.0
11	20.2	21.1	12.7	8.9
12	38.5	9.6	6.8	3.3
13	39.0	24.1	13.6	19.4
14	21.3	3.7	.7	9.8
15	35.9	22.3	14.3	10.7
16	18.1	11.0	7.1	4.2
17	26.8	13.2	6.5	3.0
18	21.0	14.2	16.4	7.1
19	3.9	2.7	.4	0.0
20	25.3	14.6	7.7	4.9
21	28.9	7.6	5.7	3.0
22	10.8	10.9	3.5	1.7
23	30.0	14.3	7.6	4.3
24	13.0	7.8	3.0	.6
25	30.9	10.4	13.0	8.5
26	26.7	21.4	14.1	11.0
27	19.5	9.4	4.7	1.6
28	24.0	12.0	5.6	3.2
29	31.7	13.4	7.7	5.8
30	38.6	19.3	12.7	9.9
31	11.1	1.6	0.0	0.0
32	14.9	16.0	12.7	9.1
33	0.0	.1	0.0	0.0
34	33.9	19.4	12.0	8.7
35	42.7	21.4	15.7	10.3
36	33.6	14.6	6.6	4.0
37	29.2	7.3	3.0	1.0
38	13.5	6.1	.5	0.0
39	0.2	0.0	0.0	0.0
40	31.9	14.1	9.4	7.6
41	26.5	12.5	8.1	5.1
42	51.2	24.0	9.3	6.1
43	25.8	7.1	2.4	.0
44	7.2	2.9	0.8	0.0
45	10.1	16.6	11.0	8.0
46	16.5	13.6	6.5	4.1
47	20.9	22.0	16.0	12.4
48	42.4	14.1	7.0	4.3
49	20.8	10.5	4.7	2.3
50	37.3	20.3	11.9	8.6
51	32.8	10.9	6.1	4.1
52	19.0	10.5	6.1	3.0
53	48.2	34.9	18.5	14.3
54	34.2	10.6	4.6	2.7
55	17.8	9.7	4.0	2.5
56	32.1	21.4	8.8	6.3
57	29.1	17.9	11.9	8.8

Cuadro 5

SINTETICO EN CORRIENTE LIRA (NICARAGUA)
VOLUMENES GENERADOS

MAYO	JUNIO	JULIO	AGOSTO	SEPTIEM.	OCTUBRE	NOVIEM.	DICIEM.
12.6	173.1	115.1	93.1	143.1	226.1	77.9	36.0
3.8	61.4	100.7	98.1	223.0	277.0	47.2	29.8
12.4	372.2	112.1	70.1	190.0	326.4	112.8	44.7
17.1	153.0	102.0	75.8	78.6	118.7	50.0	36.5
12.9	94.4	94.3	75.8	124.6	148.3	87.5	45.2
21.5	84.1	80.1	65.0	126.3	184.9	59.2	45.0
26.5	20.8	77.0	68.3	92.6	88.7	25.8	14.7
16.5	0.0	104.8	171.1	200.4	139.6	78.0	36.2
12.0	276.4	156.0	280.7	241.3	219.0	55.6	25.6
7.8	6.8	85.9	88.6	88.6	133.1	52.5	33.6
22.1	90.0	186.5	97.1	81.5	225.0	84.1	54.1
13.4	182.5	127.0	122.3	121.5	137.5	65.7	41.3
12.1	193.7	188.0	93.7	124.1	225.1	50.3	27.7
16.2	49.7	111.7	89.8	171.1	165.5	48.7	36.5
15.5	62.4	108.8	67.5	157.0	159.9	65.2	33.0
14.5	0.0	100.1	145.9	126.4	150.4	75.3	34.8
15.4	313.2	86.0	74.4	179.7	222.4	49.4	31.6
22.1	72.6	101.2	93.5	100.6	97.9	32.9	16.4
8.6	163.3	95.4	112.2	136.9	124.9	63.5	27.7
20.4	64.9	83.3	71.4	112.1	182.0	75.4	38.1
12.3	0.0	146.2	123.3	115.1	117.1	62.7	25.2
11.8	222.0	93.3	101.4	255.1	319.5	95.4	43.8
9.4	142.7	103.8	87.6	68.1	104.9	33.4	26.4
7.0	17.1	81.6	97.6	94.3	144.6	74.0	45.2
18.7	84.9	114.0	128.1	99.4	161.2	41.4	20.5
16.3	50.4	83.1	62.2	127.7	246.3	75.1	46.8
12.0	61.5	101.2	89.9	114.1	150.2	66.3	34.9
9.5	20.2	115.3	64.0	178.0	158.5	75.7	31.6
22.4	194.6	120.5	174.2	202.2	203.0	76.1	38.8
12.4	52.0	136.4	185.2	113.7	126.0	42.4	24.5
12.5	22.5	82.0	80.1	118.6	132.5	35.3	26.5
13.3	6.7	83.0	147.1	193.6	136.8	29.6	11.7
10.1	6.5	90.4	78.7	114.4	120.7	51.2	31.0
13.0	105.5	110.9	102.8	165.2	156.0	54.9	46.9
14.1	20.0	110.0	106.5	127.9	129.0	61.6	40.7
15.1	127.6	129.7	169.5	157.1	163.1	84.8	34.9
10.8	75.5	130.0	231.6	139.0	163.1	58.1	26.8
5.4	50.1	67.3	54.0	41.3	96.7	31.0	16.9
8.0	62.4	118.1	91.4	168.0	178.1	61.3	17.7
13.5	44.5	94.0	126.8	150.0	148.3	52.0	18.2
28.6	27.4	87.1	65.3	156.0	177.2	13.7	54.0
24.6	72.8	90.6	74.3	72.7	135.0	51.5	26.5
4.4	6.2	165.8	106.3	117.0	130.5	35.6	25.2
19.4	281.8	119.2	85.3	70.0	150.0	30.9	23.6
13.0	118.0	115.7	75.8	108.2	167.6	49.8	25.5
11.7	95.8	124.6	98.5	130.8	182.8	47.5	26.0
10.2	22.7	71.7	52.3	194.1	256.2	101.7	62.8
18.4	166.2	101.6	90.6	163.7	329.6	86.9	42.6
13.7	223.7	122.0	186.3	268.0	250.1	80.9	36.7
15.3	84.8	194.7	56.5	91.4	176.2	50.3	31.1
20.3	21.0	60.2	77.0	65.2	83.7	35.0	23.6
9.8	82.1	104.1	134.3	206.6	211.4	145.3	45.8
18.5	104.3	110.1	56.4	65.8	179.7	68.4	38.3
15.5	1.9	137.7	119.9	116.5	205.6	42.2	27.4
21.0	111.8	151.0	112.5	156.0	289.9	74.2	44.6
14.6	16.4	135.1	94.1	99.9	114.9	39.1	22.8
22.6	104.5	108.4	84.1	211.5	168.4	64.7	38.8

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Cuadro 5 (Continuación)

58	42.9	27.5	16.5	11.2	14.0	0.0	84.4
59	3.2	3.6	1.2	.3	13.7	43.9	122.3
60	34.1	11.5	9.1	6.8	19.0	85.9	89.8
61	37.9	14.8	6.7	4.3	17.9	149.2	143.9
62	26.7	7.3	5.0	2.1	12.3	32.3	97.0
63	29.5	8.7	5.7	3.0	5.5	0.0	100.0
64	21.5	3.5	1.7	.6	15.4	237.5	157.8
65	61.2	23.2	15.4	11.5	25.8	78.8	85.3
66	5.9	5.2	1.9	.7	12.9	76.5	74.0
67	18.9	4.1	.1	0.0	8.9	45.4	81.2
68	32.7	18.2	11.2	8.4	17.0	208.8	134.8
69	74.5	51.9	27.3	21.7	28.2	39.9	84.4
70	6.7	4.0	3.6	2.9	14.6	67.3	91.0
71	9.5	0.0	0.0	0.0	14.5	105.8	192.8
72	33.7	20.3	12.0	8.6	19.0	126.8	106.6
73	30.0	13.7	5.9	3.8	17.5	7.4	80.0
74	21.8	7.5	3.6	1.5	11.7	48.7	105.2
75	43.4	24.9	19.0	14.7	21.1	125.8	146.1
76	34.4	18.8	11.9	10.1	21.6	116.7	96.7
77	38.2	23.5	14.1	11.6	19.7	144.1	79.8
78	23.3	14.0	6.9	4.5	8.1	44.8	98.8
79	48.8	18.0	19.1	7.2	18.7	229.5	91.4
80	30.5	18.3	10.8	7.4	22.2	78.3	78.8
81	15.7	3.0	0.0	0.0	12.7	165.9	129.3
82	.4	0.0	0.0	0.0	17.9	749.1	140.7
83	17.2	11.2	5.7	4.0	5.6	97.8	89.6
84	11.7	.1	0.0	0.0	5.9	196.4	106.1
85	23.7	6.9	3.6	3.7	14.0	61.2	108.7
86	16.4	0.0	3.3	1.6	3.0	41.8	102.6
87	41.2	32.6	22.3	18.5	29.3	101.8	107.6
88	37.2	18.6	10.2	5.7	11.8	77.6	98.8
89	21.8	14.4	8.3	5.5	20.0	327.5	67.7
90	15.5	5.9	1.6	0.0	10.7	259.7	127.1
91	48.1	26.8	16.0	13.7	15.1	34.9	76.8
92	23.6	23.5	14.2	11.5	20.1	98.6	152.1
93	33.3	13.3	7.6	4.0	11.7	115.1	123.3
94	40.2	18.7	8.8	5.6	13.1	71.2	110.3
95	23.7	8.9	3.9	2.1	23.0	251.2	176.2
96	35.7	15.0	8.1	5.9	14.3	383.7	111.3
97	40.9	19.0	13.1	11.1	19.6	254.3	163.9
98	21.3	10.8	7.2	4.9	9.0	25.4	77.4
99	35.8	20.6	15.6	12.5	28.2	0.0	79.2
100	46.7	22.3	12.9	9.4	12.4	108.7	99.5
101	11.6	6.9	1.7	.5	15.4	223.3	119.6
102	35.7	10.7	2.6	1.3	7.5	48.2	67.3
103	28.1	12.6	4.5	2.6	18.1	206.1	152.1
104	25.0	10.9	5.9	3.7	20.4	128.9	104.9
105	39.6	19.7	12.5	8.7	14.0	78.4	92.3
106	44.1	27.2	14.4	9.7	19.4	151.6	141.3
107	47.5	27.6	18.2	13.9	22.3	28.1	63.5
108	10.9	9.2	3.3	1.0	12.2	8.0	96.8
109	53.5	36.7	27.2	22.8	31.3	146.9	94.6
110	29.9	13.4	5.6	3.0	9.3	85.2	103.9
111	19.6	5.8	2.8	.7	30.0	122.7	113.8
112	14.2	7.1	4.3	1.0	8.1	0.0	83.9
113	32.3	15.0	8.6	6.5	16.0	123.2	130.4
114	34.1	21.1	10.3	6.0	15.6	173.2	96.0
115	24.2	15.6	8.9	5.0	14.2	184.3	141.6
116	10.5	0.0	.0	0.0	9.2	5.9	59.8
117	11.9	9.6	6.8	3.7	21.3	295.2	208.6
118	16.4	7.8	2.3	.1	4.5	45.7	133.3
119	9.0	9.0	1.6	0.0	18.2	101.5	107.3
120	23.9	6.6	3.0	.4	10.8	179.9	108.2
121	33.5	19.8	16.8	12.8	20.3	384.4	182.8

57.0	42.7	76.7	37.4	21.7
75.4	116.0	163.5	46.8	27.3
107.0	183.9	186.8	96.6	43.0
157.9	290.9	224.6	72.4	25.1
100.0	149.3	129.2	90.0	43.5
57.2	101.6	109.2	74.6	40.7
82.5	166.9	276.1	70.4	42.5
148.0	215.0	248.3	60.9	24.5
56.4	114.3	159.8	48.5	28.1
119.8	124.8	174.1	50.3	27.7
204.9	271.5	371.3	113.0	90.2
87.7	86.8	77.4	43.7	20.9
73.8	82.6	85.4	59.3	21.3
148.5	271.8	311.1	126.0	51.9
103.1	173.3	180.5	80.0	33.5
80.2	134.6	120.2	67.3	23.9
100.4	146.9	256.8	121.1	66.7
92.9	109.5	213.0	125.6	46.3
107.8	191.2	198.6	102.3	42.4
64.2	162.0	165.7	46.0	24.2
94.6	179.8	180.5	80.2	58.3
59.5	152.1	193.6	85.5	39.2
96.1	206.5	187.6	48.2	25.7
99.8	94.7	61.7	30.6	13.9
91.8	109.8	84.3	50.1	35.0
71.6	110.9	93.2	42.0	21.1
130.0	133.0	235.3	47.7	24.0
60.0	127.5	108.8	40.7	29.3
83.0	76.8	224.3	62.1	34.9
194.5	138.8	229.2	72.8	51.1
191.3	198.0	224.2	55.8	39.1
159.2	124.5	99.8	52.4	34.4
107.6	223.2	291.0	96.1	39.0
71.6	91.2	65.0	32.5	26.4
146.5	184.0	282.6	76.4	40.9
129.8	180.3	160.9	76.4	61.2
109.4	144.5	189.3	67.6	32.1
104.7	151.7	152.8	137.9	58.1
96.2	128.7	209.8	79.7	54.7
171.8	136.3	143.0	75.6	47.4
81.7	139.2	214.2	51.5	38.2
101.7	100.6	198.2	88.6	47.4
91.6	106.2	167.3	69.9	18.8
71.4	245.3	296.1	73.6	32.8
58.8	79.4	113.9	50.5	27.0
177.4	105.1	176.4	60.2	30.9
94.0	103.4	201.0	81.3	40.3
85.5	226.4	386.1	207.4	73.4
161.9	193.0	209.4	64.2	36.2
48.2	61.8	74.0	35.8	20.3
98.7	155.8	247.1	204.9	78.2
65.8	55.7	72.5	34.3	23.3
66.1	106.5	190.3	82.5	41.5
85.4	86.5	124.8	48.4	20.5
119.8	92.8	144.0	68.9	33.3
84.4	142.9	177.7	121.3	44.7
82.2	124.8	123.0	33.2	24.9
151.1	116.2	103.0	45.7	17.9
72.1	56.3	86.0	37.9	25.2
127.8	105.5	99.1	40.5	23.0
145.1	140.2	209.5	45.6	17.2
135.9	75.5	76.5	45.9	28.0
135.0	103.4	102.2	41.6	31.5
99.2	113.3	186.9	39.7	37.7

Cuadro 5 (Continuación)

122	37.0	14.3	5.5	2.9	6.9	92.0	83.8	118.1	119.6	111.7	60.0	41.2
123	53.1	33.0	16.0	10.8	19.6	90.5	126.6	114.1	170.4	225.1	66.8	47.6
124	16.7	8.3	5.8	4.2	9.8	3	49.3	76.4	98.3	231.9	125.3	104.2
125	59.7	26.6	19.0	14.6	13.4	57.1	115.5	144.3	135.5	90.1	85.6	59.1
126	44.0	29.3	20.2	15.9	32.7	101.5	116.1	98.4	106.2	138.2	58.7	29.9
127	17.4	4.7	1.9	0.0	3.4	23.5	73.9	91.9	132.3	290.4	42.5	23.0
128	23.1	2.6	1.6	0.0	5.7	97.8	115.0	101.5	156.8	220.6	69.4	37.1
129	23.5	6.0	3.6	0.0	9.4	36.1	113.3	86.8	147.7	177.3	63.7	25.3
130	19.3	10.0	7.5	6.0	22.9	213.0	157.5	96.8	82.1	78.5	42.9	25.6
131	28.0	14.9	10.1	6.6	14.9	127.7	114.8	69.2	111.0	75.7	55.4	28.5
132	32.6	21.5	8.2	5.3	13.9	248.7	101.7	91.3	119.8	180.0	41.4	26.7
133	7.4	2.8	1.4	0.0	6.0	39.1	192.7	68.6	38.2	80.0	30.5	20.9
134	6.4	0.0	0.0	0.0	0.8	0.0	149.0	229.5	210.0	204.5	115.5	39.4
135	50.3	31.8	21.8	17.0	21.6	61.8	63.6	51.0	76.1	104.4	56.4	60.0
136	17.9	6.3	5.1	3.6	13.6	0.0	118.4	89.4	119.3	162.5	80.6	27.0
137	50.7	16.9	18.5	15.3	13.9	136.0	105.3	109.9	153.6	273.6	108.3	36.5
138	10.5	7.4	3.2	0.0	10.6	219.7	140.1	159.1	153.6	64.4	77.4	40.8
139	41.7	29.7	19.9	14.6	22.5	148.9	64.5	49.2	67.1	49.4	132.2	72.7
140	38.0	29.0	15.5	10.6	18.6	73.8	95.7	132.7	183.6	240.3	137.4	39.0
141	54.4	39.1	29.9	16.0	19.6	61.6	130.5	119.0	86.1	115.7	39.7	18.2
142	11.8	3.6	0.0	0.0	12.0	59.4	85.5	93.2	108.9	159.3	51.5	33.4
143	30.4	16.2	7.4	4.6	12.4	21.4	85.8	88.0	95.0	137.7	51.5	27.5
144	32.3	13.3	6.1	3.3	14.5	95.9	119.7	120.7	116.5	201.1	77.4	30.3
145	41.0	23.3	14.2	11.4	24.5	372.6	131.8	117.8	115.8	64.1	39.0	16.7
146	13.6	8.7	6.1	1.8	18.0	49.2	127.0	244.1	172.0	209.7	193.2	37.1
147	19.4	9.0	4.3	3.0	16.7	663.9	162.0	192.6	167.2	184.2	52.4	45.3
148	39.5	21.8	11.9	8.0	18.3	97.6	120.6	119.5	69.0	149.7	55.3	29.9
149	17.1	1.9	1.9	1.1	8.5	74.0	94.4	61.9	143.2	172.5	55.1	35.1
150	17.1	7.1	6.3	1.8	13.9	156.9	121.0	102.4	143.2	172.5	75.9	35.4
151	22.1	13.4	6.4	3.6	12.1	17.7	109.0	95.0	112.6	169.9	48.6	31.2
152	12.2	8.2	6.5	2.2	9.1	101.2	124.3	124.3	143.9	272.5	96.7	42.3
153	24.7	21.8	13.0	9.9	18.2	103.2	121.4	106.4	89.3	139.9	44.5	33.1
154	13.0	5.7	3.0	2.3	7.5	0.0	68.4	55.5	86.7	139.9	44.5	33.1
155	32.8	24.0	14.1	10.0	28.9	89.1	79.5	76.1	189.4	202.7	72.3	43.8
156	42.1	30.7	23.4	17.7	23.5	229.5	121.9	92.7	141.5	277.7	76.4	46.8
157	32.5	14.5	9.6	7.2	17.5	48.3	83.7	99.4	102.5	68.9	26.5	10.0
158	0.0	0.0	0.0	0.0	17.8	126.5	108.6	77.5	112.2	191.3	73.6	38.1
159	17.6	8.8	3.7	1.7	27.8	326.4	126.7	108.7	121.4	169.2	128.8	52.3
160	52.9	32.9	24.9	20.1	19.8	481.7	196.4	126.0	47.8	113.0	40.3	26.0
161	18.4	11.1	6.8	2.1	6.6	158.7	135.7	159.9	158.5	103.7	77.8	33.2
162	33.6	15.1	7.0	5.3	29.6	146.3	112.1	120.1	175.1	163.7	49.7	32.5
163	18.0	9.5	1.3	4.4	14.1	31.0	79.3	50.0	92.4	90.3	41.5	17.4
164	3.3	3.7	2.6	0.7	7.6	9.0	86.6	59.5	122.0	189.2	74.2	51.4
165	58.3	40.5	25.2	20.2	46.0	373.0	154.2	134.3	82.5	136.1	65.9	22.7
166	18.1	12.1	7.1	3.8	14.0	87.0	92.2	91.8	169.7	236.3	147.8	80.6
167	62.5	28.1	19.1	14.1	17.2	64.8	98.2	96.1	109.1	162.8	45.0	24.1
168	25.2	9.7	5.7	3.7	14.3	69.9	83.5	87.7	151.4	156.4	48.0	21.5
169	14.7	13.4	8.1	5.0	16.5	137.5	137.5	153.1	135.1	74.8	30.7	41.8
170	0.0	6.5	1.1	0.0	21.0	268.2	89.7	103.4	95.8	166.7	112.1	41.8
171	37.8	19.2	11.5	7.1	16.2	59.4	91.8	89.4	141.4	111.9	46.0	41.2
172	38.1	26.7	17.3	12.6	17.3	15.3	77.9	144.2	128.4	148.2	39.3	25.3
173	19.7	4.6	7.8	5.5	8.7	0.6	116.3	163.6	203.4	206.7	180.8	85.3
174	44.7	21.0	12.8	10.0	21.9	86.5	153.3	107.5	89.3	162.2	53.7	29.8
175	16.1	4.9	1.6	0.9	12.3	122.1	71.6	98.3	75.1	88.7	41.6	20.7
176	15.5	7.8	5.0	3.7	7.2	33.9	92.8	159.2	162.9	172.2	51.7	47.5
177	61.5	30.7	19.1	14.0	17.9	143.4	85.8	129.9	129.0	203.6	73.0	46.6
178	33.5	12.1	4.7	3.1	11.3	49.1	70.7	57.9	81.0	131.4	70.9	43.9
179	47.8	23.9	16.6	13.6	15.1	0.0	113.8	150.2	145.1	240.9	69.4	50.7
180	33.3	15.4	10.6	7.5	13.0	56.8	96.2	77.2	105.0	118.7	60.0	29.0
181	33.9	15.4	10.6	7.5	13.0	56.8	96.2	77.2	105.0	118.7	60.0	29.0
182	14.0	2.4	2.1	1.3	10.8	162.0	79.0	89.5	169.6	150.4	58.0	35.0
183	16.2	11.4	8.4	6.0	11.2	121.9	88.8	208.2	177.6	216.9	40.2	22.3
184	58.7	32.7	22.1	18.0	23.8	108.8	115.4	94.6	179.6	261.8	96.4	47.9
185	35.9	13.9	6.8	4.1	5.6	81.9	82.6	92.8	214.6	243.3	84.2	66.4

186	52.9	42.0	26.2	21.0	19.2
187	29.3	15.4	7.8	5.1	15.7
188	20.2	11.3	6.8	3.2	11.3
189	30.8	14.2	8.2	5.8	18.3
190	14.4	5.1	1.0	0.0	11.0
191	22.9	7.0	1.9	1.3	7.8
192	14.1	12.4	10.0	7.0	8.3
193	51.0	19.2	11.2	7.3	21.7
194	46.7	23.9	19.0	16.6	23.8
195	49.2	33.1	22.9	18.1	19.9
196	0.0	4.7	2.7	0.0	14.3
197	37.5	27.3	16.4	11.9	17.7
198	19.0	6.6	3.3	0.7	15.6
199	29.6	12.9	6.1	3.3	9.2
200	17.6	9.0	8.6	6.0	14.3
201	14.9	5.3	3.2	0.6	8.5
202	35.2	18.9	12.3	9.5	24.5
203	11.7	5.5	4.7	2.1	15.6
204	16.1	3.0	2.6	0.6	6.4
205	16.3	14.2	6.6	4.4	7.7
206	29.5	14.0	8.4	5.0	8.7
207	39.3	18.3	13.6	8.2	20.6
208	40.1	18.6	10.9	7.4	21.0
209	43.6	20.3	13.3	12.0	22.0
210	29.2	22.6	14.1	10.3	16.1
211	51.1	21.6	14.2	10.5	18.6
212	21.4	16.1	6.6	3.5	12.2
213	48.4	37.3	27.3	21.5	16.1
214	29.6	16.2	9.6	5.9	11.7
215	49.6	35.2	21.3	16.5	15.8
216	40.1	23.7	11.3	8.0	16.6
217	20.4	4.4	0.2	0.0	2.0
218	24.3	9.3	3.6	0.4	12.6
219	18.1	2.7	0.3	0.0	8.9
220	22.2	11.7	8.4	6.8	15.2
221	0.0	4.4	1.0	0.7	7.4
222	12.1	8.0	4.9	2.6	7.4
223	36.0	23.5	14.7	10.5	17.6
224	8.6	5.2	3.6	1.7	9.3
225	15.1	7.6	2.3	0.3	15.5
226	34.8	11.5	5.6	4.6	12.0
227	5.8	3.8	2.2	0.8	6.9
228	24.7	16.2	9.5	6.2	10.7
229	39.6	22.6	15.3	11.0	13.7
230	32.2	12.6	6.1	3.5	5.9
231	4.2	0.0	0.0	0.0	4.0
232	23.5	7.1	3.1	1.0	12.7
233	28.3	16.6	11.6	8.8	11.7
234	16.0	12.0	10.0	6.0	19.0
235	42.2	23.2	16.5	11.3	18.5
236	29.2	10.4	5.0	2.2	15.8
237	28.2	11.9	6.4	3.2	11.5
238	46.8	19.6	11.0	7.1	13.7
239	49.4	28.9	11.7	7.4	11.5
240	6.6	9.4	5.7	3.3	11.6
241	27.3	9.9	6.3	4.6	21.0
242	13.2	6.1	5.7	2.7	5.7
243	37.0	10.0	5.0	3.0	25.3
244	32.5	16.8	6.3	3.7	21.2
245	12.7	12.0	7.6	4.8	9.7
246	28.0	16.9	11.9	9.5	16.1
247	31.5	15.2	8.0	7.3	9.7
248	29.8	26.6	15.6	10.5	13.1
249	43.6	24.6	18.5	4.0	19.6

136.8	87.1	68.6	136.5	225.5	71.6	282.8
243.2	81.8	83.5	161.4	146.2	55.2	28.2
9	86.7	72.3	130.0	225.0	72.5	33.9
67.0	130.8	113.4	159.0	84.5	30.3	18.3
115.8	152.4	100.3	86.9	129.6	60.0	32.1
42.6	89.3	91.1	162.1	265.9	61.9	29.0
8	95.3	210.6	206.2	237.8	126.1	50.0
26.5	65.5	100.9	144.5	215.5	84.2	64.1
39.5	116.2	86.6	201.4	292.7	82.0	42.9
61.0	116.5	75.7	68.9	106.8	37.6	12.7
169.4	148.7	176.5	181.5	216.1	75.4	35.5
56.2	125.8	206.9	120.4	123.2	44.3	20.6
132.4	78.9	82.8	162.9	289.3	120.1	43.3
77.5	108.1	58.6	80.3	134.9	45.1	76.0
19.4	86.1	129.5	254.6	140.3	36.4	22.9
6.4	95.5	79.6	157.6	185.7	64.6	51.0
162.8	128.9	130.6	146.1	252.5	50.0	23.1
129.9	87.9	67.2	67.3	61.7	46.3	27.1
45.4	130.0	68.7	113.1	159.0	36.5	17.2
76.6	110.0	96.0	149.1	169.9	66.9	36.8
126.0	123.4	155.6	147.9	174.7	82.9	51.2
104.2	137.4	170.1	259.5	375.4	72.8	50.6
62.7	76.6	121.2	105.2	177.7	81.4	51.4
33.7	98.1	145.8	227.2	348.3	92.1	39.1
317.7	90.0	136.8	168.1	190.2	90.4	43.0
112.0	123.5	145.8	82.4	160.7	44.5	18.7
154.2	84.9	92.8	146.3	335.0	175.7	69.4
310.5	123.7	77.2	74.4	109.2	52.4	41.4
146.4	89.3	171.8	194.0	273.2	128.6	97.3
185.2	75.2	68.3	142.2	289.9	127.1	41.9
18.7	71.9	74.9	221.5	280.1	80.1	31.4
30.8	99.9	71.0	110.4	111.7	75.8	32.0
76.7	114.9	140.5	177.5	201.8	73.3	28.4
298.4	164.2	81.6	141.2	228.0	80.1	38.9
299.6	140.6	112.1	178.3	121.4	28.5	12.5
19.3	54.8	76.0	125.8	120.5	40.2	16.8
0	49.6	111.8	148.4	236.4	69.5	36.6
24.6	134.9	74.7	111.8	102.2	37.9	17.3
107.2	132.9	136.3	161.8	160.7	39.2	21.7
196.5	84.2	74.4	166.6	185.6	51.3	33.0
261.2	86.9	61.5	98.7	153.1	64.2	23.6
78.9	164.0	100.4	161.0	165.5	55.8	26.4
215.6	113.2	280.6	150.6	285.6	140.5	39.8
192.5	148.1	183.1	131.2	285.9	58.3	48.5
42.8	64.1	58.8	80.0	66.8	28.8	17.3
8.0	74.0	116.3	166.8	271.9	107.1	62.7
81.3	74.0	63.1	57.0	75.1	43.1	30.9
27.4	126.4	97.7	181.0	47.6	35.7	22.6
15.3	90.4	115.1	167.2	203.3	53.5	41.6
65.7	121.8	72.2	166.6	188.5	53.4	31.0
141.2	123.0	83.0	127.0	104.9	38.5	22.1
98.0	94.7	145.9	350.0	602.1	129.2	68.9
45.1	98.9	68.0	112.8	177.8	74.1	49.7
0.6	89.7	92.3	52.4	51.2	41.3	23.3
105.2	111.5	181.7	124.3	202.5	90.5	36.7
117.1	94.8	100.5	84.2	114.4	46.9	25.0
0.0	101.4	190.0	230.5	410.5	201.8	84.2
264.1	136.7	98.3	94.1	175.7	60.4	42.1
66.5	89.2	110.8	125.0	88.9	32.4	28.0
81.2	89.9	163.8	151.0	208.4	53.9	31.7
130.4	148.6	107.0	114.0	234.5	78.6	66.8
67.4	79.8	91.8	82.1	102.4	57.4	28.7
72.4	101.2	123.8	113.0	167.2	91.6	46.2
80.9	94.7	104.0	152.1	142.6	63.6	42.3

Cuadro 5 (Continuación)

250	19.9	11.9	16.0	18.3	193.3	104.1	63.1	98.8	164.0	65.3	28.9
251	31.5	0.9	0.0	9.0	99.5	117.4	101.9	127.3	103.6	56.6	48.4
252	28.3	16.5	6.1	9.5	130.5	97.0	122.8	119.6	221.1	50.9	31.2
253	17.2	6.7	2.1	11.4	64.8	21.3	53.8	56.3	64.8	39.7	21.2
254	23.4	10.7	4.3	9.5	19.0	130.0	204.9	164.1	130.2	74.1	37.0
255	21.4	3.0	1.3	10.6	7.8	94.3	81.6	63.4	105.3	38.3	20.9
256	16.7	11.1	2.6	10.8	141.4	115.1	82.2	170.7	278.2	153.7	52.4
257	26.2	17.5	13.1	20.5	241.7	104.2	76.3	192.9	193.5	83.5	33.5
258	35.1	11.3	9.1	30.5	67.3	76.1	71.1	116.9	150.2	61.5	36.9
259	17.6	1.7	0.2	11.9	113.9	145.3	187.7	163.4	150.3	53.4	27.2
260	23.1	9.7	6.6	16.9	57.9	102.9	120.6	214.0	227.2	61.2	29.7
261	25.5	14.0	4.1	12.2	0.0	94.5	90.9	89.4	195.8	67.9	36.8
262	29.1	17.8	9.5	19.0	102.5	74.5	86.8	130.1	275.0	133.7	55.9
263	41.0	11.5	7.9	21.5	240.8	194.2	98.4	180.7	239.5	179.2	78.2
264	41.7	10.1	6.7	8.7	167.1	219.2	105.6	87.8	132.9	98.1	20.9
265	18.1	13.8	5.0	20.6	128.5	189.7	83.0	142.8	224.3	75.2	37.8
266	11.6	0.9	0.4	11.4	253.7	169.8	120.4	182.8	171.8	39.6	18.4
267	6.0	0.0	0.0	8.6	73.1	91.0	78.1	97.9	143.8	52.4	35.1
268	25.3	5.6	3.1	22.3	21.3	99.1	117.0	155.1	188.1	156.0	63.3
269	35.7	13.2	9.5	26.2	61.4	119.9	85.9	102.6	178.2	41.2	21.9
270	7.6	1.8	1.0	10.0	25.6	97.6	102.6	102.7	127.1	50.9	23.6
271	12.6	1.4	0.0	9.5	3.9	84.4	56.5	127.3	160.8	88.7	37.1
272	21.7	9.9	6.3	11.3	25.5	99.3	120.2	135.2	167.3	110.5	50.9
273	35.8	19.5	7.6	22.5	21.6	86.0	102.2	219.7	179.1	69.8	27.4
274	26.1	14.6	7.0	9.0	62.7	99.2	104.6	106.0	129.9	80.6	39.9
275	25.0	20.2	6.2	14.3	26.9	75.1	134.9	230.4	388.5	86.5	24.1
276	13.7	4.6	0.0	15.7	95.2	123.0	164.4	122.7	178.4	48.1	30.6
277	27.9	9.8	5.5	12.7	61.8	130.5	110.0	86.7	130.3	72.4	53.7
278	36.5	20.0	7.1	25.1	194.5	186.1	119.0	230.8	415.8	288.3	102.7
279	56.4	33.3	9.5	18.4	86.8	82.8	121.0	191.7	223.3	56.9	24.3
280	18.2	8.9	2.4	18.9	0.0	69.5	80.1	121.2	197.0	57.5	20.4
281	11.0	4.4	0.0	8.5	44.4	79.2	41.6	47.6	85.9	47.2	23.6
282	14.7	10.5	3.6	13.2	87.3	153.2	177.7	77.4	82.0	30.3	13.3
283	9.9	4.0	0.0	12.5	48.4	104.9	136.9	102.3	228.3	83.8	39.4
284	23.4	13.2	3.6	16.2	51.7	68.1	67.1	66.6	80.2	59.8	40.1
285	24.7	19.1	4.2	9.0	9.0	187.8	79.1	59.0	114.3	67.1	39.2
286	36.8	25.0	11.1	7.2	73.3	133.2	129.7	175.1	110.1	47.3	23.1
287	28.2	24.8	8.6	21.1	47.1	80.1	116.4	242.0	349.4	63.5	42.2
288	39.6	23.4	16.7	12.8	39.0	124.4	156.7	155.2	161.7	50.1	31.0
289	17.0	10.3	3.0	16.3	120.7	129.4	186.7	219.3	229.4	76.8	45.9
290	39.3	16.4	4.0	13.9	0.0	67.0	61.5	64.8	62.6	33.1	18.1
291	29.5	15.4	5.0	12.8	124.4	95.1	181.3	212.3	200.0	83.2	60.1
292	53.5	25.6	13.3	15.6	106.4	121.4	123.6	178.9	134.3	36.4	20.2
293	17.6	8.7	4.0	15.7	90.6	125.9	115.9	203.9	299.4	118.5	40.2
294	28.8	17.2	8.6	18.2	14.9	49.0	89.1	80.8	188.6	62.8	41.3
295	22.9	13.3	2.5	11.2	191.1	129.3	96.3	76.3	118.6	72.3	48.0
296	40.6	29.9	13.4	26.5	119.2	83.5	88.2	74.1	70.7	46.3	22.4
297	21.4	9.2	2.5	8.4	46.1	85.1	191.4	243.9	236.8	119.3	47.7
298	21.4	21.6	12.9	31.7	16.9	59.1	82.1	196.9	345.0	167.0	73.7
299	53.0	32.4	6.6	10.2	79.7	104.0	149.4	262.0	231.5	69.4	39.5
300	40.2	22.4	8.9	18.6	2.1	122.0	61.0	173.9	176.8	81.1	50.5
301	51.5	31.3	13.0	5.6	64.8	124.0	187.0	196.0	393.7	196.3	75.6
302	57.0	28.0	10.5	10.7	30.3	71.8	70.8	156.4	137.2	66.7	26.5
303	6.7	2.5	0.0	8.0	10.4	95.1	113.0	145.8	210.1	62.8	50.7
304	24.3	6.7	9.1	25.4	293.4	159.5	156.9	70.8	99.1	40.6	20.9
305	34.9	11.4	3.6	9.1	0.0	65.5	60.9	136.8	154.9	81.5	40.1
306	28.2	15.5	7.4	20.6	80.9	107.2	95.5	109.1	90.8	42.8	25.6
307	29.1	15.3	5.2	7.4	142.6	92.7	111.7	93.3	90.7	52.7	29.0
308	19.4	7.6	2.9	11.7	63.2	64.9	52.1	64.2	74.5	41.0	19.1
309	23.4	8.8	6.6	11.4	16.2	97.1	115.2	66.9	81.7	56.5	42.0
310	8.2	4.6	0.6	28.0	89.1	104.3	189.6	139.1	123.4	56.0	25.9
311	35.8	22.6	9.7	28.0	89.1	104.3	189.6	139.1	123.4	56.0	25.9
312	16.1	6.5	1.4	8.1	64.8	102.5	142.1	142.1	175.2	55.7	26.5
313	9.8	7.0	3.0	14.8	98.3	112.3	101.5	140.8	227.6	57.3	42.1

314	25.3	11.0	6.9	4.0
315	23.1	10.2	5.4	2.5
316	36.7	17.4	10.1	7.8
317	23.1	13.2	6.4	3.9
318	29.5	17.1	6.3	3.0
319	31.9	11.0	6.1	3.9
320	38.2	17.4	9.7	6.0
321	40.4	21.0	11.0	8.0
322	33.9	22.3	11.3	9.0
323	18.6	9.0	4.4	2.7
324	18.2	7.8	2.3	.1
325	32.4	10.3	5.2	2.9
326	26.7	6.0	2.5	1.8
327	33.2	19.7	12.0	8.0
328	1.1	0.0	0.0	0.0
329	19.5	18.1	11.6	7.7
330	42.0	29.0	19.5	13.2
331	36.6	30.5	19.3	14.0
332	44.0	21.7	13.1	8.0
333	15.3	7.0	2.7	2.0
334	39.6	11.6	3.3	2.1
335	42.8	24.9	17.0	14.1
336	36.1	19.7	11.0	7.0
337	54.9	35.7	23.3	18.0
338	27.4	26.6	14.0	10.0
339	22.4	13.5	6.4	4.5
340	13.4	0.0	0.0	0.0
341	17.6	13.2	7.6	4.6
342	47.6	20.1	16.9	11.6
343	23.6	4.7	.6	0.0
344	39.4	22.3	12.6	9.0
345	30.7	24.6	17.5	13.2
346	33.2	22.5	17.4	12.3
347	12.8	3.3	0.0	0.0
348	39.0	27.0	16.7	11.6
349	24.0	8.7	1.5	.9
350	31.2	14.4	9.1	5.0
351	32.9	31.2	21.3	17.0
352	21.7	15.6	6.5	4.3
353	41.6	23.7	12.5	9.2
354	39.4	39.4	30.4	24.0
355	17.3	0.0	6.7	2.0
356	12.3	4.5	2.2	.2
357	40.4	22.0	13.1	8.9
358	34.5	22.2	12.0	10.5
359	10.0	4.9	1.0	0.0
360	31.7	16.4	5.9	3.6
361	17.6	11.7	6.5	4.1
362	27.3	19.3	6.2	3.6
363	53.3	32.5	25.0	20.6
364	42.3	34.4	17.9	11.8
365	10.0	.7	0.0	0.0
366	24.3	14.1	6.0	3.7
367	32.7	15.0	6.5	3.9
368	36.3	16.4	8.5	5.0
369	28.3	9.0	3.9	1.6
370	4.0	1.6	.4	0.0
371	18.3	1.2	0.0	0.0
372	26.5	15.3	9.7	5.1
373	28.4	25.7	15.3	13.1
374	12.4	4.9	.0	0.0
375	28.4	9.6	2.7	.4
376	10.3	3.7	2.1	.6
377	18.2	12.0	6.0	3.0

Cuadro 5 (Continuación)

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14.7	17.5	187.9	121.5	117.3	247.6	114.4	48.8
18.1	152.2	99.6	146.4	136.4	110.4	53.6	31.4
22.6	90.9	127.8	183.0	190.6	145.9	60.7	44.6
16.8	180.8	100.1	92.9	130.6	134.8	49.4	29.1
7.9	21.0	84.6	104.4	144.9	184.1	61.2	32.6
15.9	57.3	133.8	97.2	137.8	186.0	47.5	45.8
23.5	23.1	90.5	95.0	101.9	110.5	57.0	53.1
12.5	100.5	72.1	139.5	148.6	236.3	76.7	61.5
11.1	53.9	119.4	91.1	206.8	238.6	53.3	26.3
7.9	187.5	93.3	135.5	222.4	305.9	41.8	30.1
6.4	87.4	92.0	106.5	140.8	184.7	125.4	60.3
15.7	58.1	89.8	92.3	162.9	292.5	61.2	41.1
11.6	38.6	108.5	114.0	114.2	80.6	51.8	42.0
19.9	66.4	80.9	63.5	63.8	94.8	27.2	11.5
6.6	67.4	131.7	109.8	106.5	100.9	74.5	31.0
16.3	9.1	90.5	95.6	172.9	253.8	118.1	50.6
14.0	208.2	94.3	73.2	185.4	308.5	144.2	47.6
13.3	78.7	90.9	190.5	150.6	146.2	97.2	52.0
11.2	150.3	97.2	73.8	112.5	187.1	61.5	30.1
8.1	11.7	109.9	68.8	171.5	223.8	84.6	36.4
14.5	318.1	115.7	92.0	151.7	135.2	131.0	55.1
21.3	236.6	113.9	118.1	198.6	222.9	157.5	100.1
15.0	25.5	125.1	85.7	151.5	310.1	145.9	62.2
12.1	187.4	97.1	95.1	142.2	118.8	42.6	47.8
34.7	286.9	138.2	203.7	191.5	124.9	48.2	28.8
11.8	8.0	99.3	167.2	211.3	152.1	44.7	25.1
10.4	98.5	90.2	197.9	1232.6	185.3	49.9	29.0
13.9	77.8	93.2	77.3	121.8	198.1	76.6	57.4
17.5	64.5	78.2	92.5	90.8	104.8	42.9	17.8
7.9	63.9	78.0	81.3	71.7	143.9	60.6	42.7
12.4	4.9	115.9	135.7	91.4	149.4	69.8	27.3
21.3	38.8	90.9	68.6	88.2	198.9	65.4	56.6
21.0	153.7	118.3	127.9	72.1	160.8	41.2	25.0
13.4	92.7	99.8	67.3	175.9	181.3	66.9	33.4
24.0	185.4	95.5	68.2	116.0	91.3	67.7	44.6
11.8	44.1	104.9	74.0	107.0	190.9	88.3	50.5
22.7	52.3	92.1	91.5	195.8	162.8	50.6	34.7
27.3	294.8	141.1	147.4	206.2	191.0	94.1	45.8
10.1	63.1	124.4	119.4	143.5	209.5	64.8	32.1
13.8	48.2	115.9	192.0	407.7	332.1	114.7	72.0
25.8	271.2	130.4	224.6	169.8	191.9	53.7	23.1
11.3	195.7	115.9	1.3	81.4	78.4	42.8	22.8
14.2	223.3	131.6	124.6	114.4	133.4	42.2	37.8
17.6	14.6	95.1	76.5	130.6	193.4	119.0	58.1
24.9	116.6	114.4	68.5	72.8	123.6	36.0	16.6
22.9	74.7	113.7	110.3	139.1	111.1	36.1	20.5
10.8	48.8	97.2	126.5	118.7	128.9	64.3	29.4
15.3	255.8	123.6	112.7	187.1	159.1	44.8	20.6
20.1	36.6	102.4	118.8	187.0	197.4	140.0	63.5
23.0	33.6	80.1	118.8	178.9	176.8	78.7	52.1
10.9	131.4	139.3	75.0	125.4	189.7	58.5	24.5
15.7	12.3	116.6	78.3	87.1	151.4	93.3	36.0
9.2	81.6	90.1	72.1	172.2	231.2	62.8	41.4
11.0	90.2	86.8	74.2	108.4	82.3	71.2	40.3
14.2	187.8	75.5	112.7	136.6	270.0	70.1	41.3
4.6	19.7	119.0	163.2	141.8	125.2	44.1	22.6
11.2	164.6	94.9	54.8	69.3	92.3	52.5	22.7
9.4	82.9	94.2	94.3	159.0	193.8	80.2	33.6
11.7	141.2	205.0	80.5	148.1	188.0	68.2	36.0
33.6	246.4	150.3	67.7	44.4	89.4	47.5	28.5
5.1	6.8	105.0	138.2	115.4	223.9	64.8	30.5
7.1	61.3	139.8	89.5	145.5	130.3	60.6	24.5
15.4	25.1	87.8	108.2	76.6	125.5	34.2	22.7
8.6	44.2	117.6	100.4	108.8	203.3	61.9	39.0

BIBLIOTECA NACIONES UNIDAS MEXICO

378	22.4	7.7	5.1	3.7
379	10.6	3.6	1.5	0.0
380	33.4	9.2	1.2	0.0
381	71.3	47.7	33.0	27.8
382	18.6	10.4	6.7	3.4
383	20.8	11.3	5.3	3.3
384	18.3	.8	.3	0.0
385	49.5	35.9	26.6	20.4
386	14.0	3.1	1.0	.0
387	48.0	26.5	11.5	7.2
388	20.6	9.5	5.3	2.8
389	28.6	14.0	7.6	4.7
390	6.0	5.3	4.1	1.7
391	26.0	12.7	6.4	4.0
392	17.1	5.0	1.4	0.0
393	22.4	6.1	2.8	1.6
394	19.2	10.0	6.4	4.0
395	26.1	14.2	5.8	3.6
396	20.2	18.3	10.4	5.0
397	6.7	1.7	.5	0.0
398	19.3	9.2	3.0	1.8
399	45.0	23.8	15.7	11.0
400	48.8	28.6	15.7	12.0
401	33.2	22.8	15.3	12.4
402	33.6	12.4	6.1	3.7
403	34.4	17.1	6.8	5.3
404	24.0	5.7	5.3	2.3
405	11.8	0.0	.2	0.0
406	32.0	17.1	12.6	8.6
407	39.7	18.1	11.7	8.2
408	20.2	7.7	1.6	.4
409	35.9	12.7	6.0	4.6
410	29.7	15.2	8.5	5.6
411	9.4	4.3	1.1	.9
412	35.2	18.3	12.1	9.2
413	67.0	41.7	23.5	18.1
414	10.2	6.6	3.0	2.7
415	2.1	11.2	5.7	4.0
416	25.3	10.2	6.7	5.0
417	6.0	4.1	2.7	1.1
418	28.2	12.8	6.6	3.6
419	6.2	10.9	7.3	4.8
420	51.5	31.2	21.5	16.7
421	34.1	16.8	13.3	9.3
422	12.2	1.8	0.0	0.0
423	14.7	7.2	4.4	1.2
424	25.0	6.8	4.0	2.5
425	11.7	5.3	1.7	.7
426	31.9	17.7	10.3	7.4
427	9.3	5.4	1.6	.1
428	31.1	18.2	10.4	7.3
429	29.8	11.1	5.8	3.2
430	20.0	15.2	7.8	6.1
431	34.8	22.1	11.0	8.6
432	34.5	16.0	10.7	7.6
433	14.6	3.9	1.4	.1
434	53.9	15.1	7.9	4.0
435	37.8	23.5	17.3	14.2
436	5.0	5.7	4.2	2.5
437	26.5	20.6	10.4	7.7
438	55.5	41.1	29.0	27.3
439	10.5	3.5	1.8	.9
440	17.3	14.2	8.5	5.8
441	20.1	10.0	3.8	1.6

Cuadro 5 (Continuación)

13.0	144.2	154.0	120.9	80.6	99.9	51.0	25.9
11.7	170.0	105.3	167.4	170.5	294.2	117.2	44.8
10.1	6.0	84.7	54.2	97.2	251.3	117.4	58.6
21.0	318.9	135.2	158.7	141.2	203.6	47.2	23.8
18.7	29.8	185.5	136.8	231.2	270.5	59.6	33.3
15.6	65.1	126.7	73.2	94.1	169.0	58.2	30.3
13.3	110.7	149.9	111.8	211.9	253.2	103.0	46.4
38.0	105.4	91.0	75.2	122.3	111.3	80.0	28.5
3.6	6.0	99.8	104.7	204.0	264.3	116.4	96.0
17.4	192.8	139.0	115.1	112.5	74.8	39.1	33.3
7.6	221.0	112.3	83.4	126.1	162.3	43.5	25.2
14.2	0.0	98.0	165.3	144.1	209.0	39.8	17.3
8.4	0.0	83.8	116.6	73.9	115.8	33.4	23.0
19.1	73.4	89.7	76.7	76.4	92.8	35.1	28.1
10.8	73.1	116.5	93.7	118.9	195.3	80.6	36.7
17.7	11.3	119.1	155.3	185.0	246.9	56.7	36.5
19.5	161.1	82.6	109.8	159.2	177.1	62.0	27.4
24.2	133.2	104.9	54.3	136.1	118.4	59.6	41.1
7.8	28.8	101.8	144.6	154.1	138.4	45.3	20.1
8.2	12.5	56.5	67.6	66.8	66.5	40.7	26.5
10.8	34.5	81.2	85.4	232.0	156.7	83.1	54.3
20.8	74.1	89.4	65.7	110.9	185.0	57.8	59.8
16.8	22.5	79.1	81.7	144.8	192.0	88.6	42.6
17.9	206.2	146.2	128.0	115.5	220.6	119.6	34.8
19.3	89.7	128.0	79.0	161.9	315.4	78.5	42.3
16.8	88.0	96.7	129.3	123.1	83.2	63.6	38.1
9.8	188.7	86.5	129.4	111.9	107.1	38.7	18.5
14.1	92.5	116.8	138.6	275.6	321.7	75.1	42.0
11.1	18.9	116.9	104.7	121.8	218.4	108.9	40.6
12.5	36.3	126.7	86.1	113.4	141.6	57.8	27.6
11.2	185.2	138.0	144.9	219.7	172.6	64.1	38.2
12.3	104.1	63.2	79.0	92.4	127.9	42.3	21.0
14.2	9.9	81.6	69.9	123.5	138.9	64.2	26.3
17.1	59.4	79.0	76.8	184.6	150.9	58.5	39.7
24.5	264.9	156.6	73.0	199.0	226.1	94.9	60.8
17.7	178.3	91.3	120.2	131.5	121.2	43.2	19.3
11.2	64.4	91.6	81.5	87.6	81.9	69.4	23.4
7.1	87.5	96.5	76.2	147.3	185.8	102.9	45.7
13.4	74.4	79.2	83.7	134.4	224.0	36.4	12.5
8.1	281.9	133.3	231.0	171.6	94.4	44.2	28.8
14.0	124.6	69.3	78.3	152.1	223.1	37.2	17.0
13.4	124.6	107.9	92.1	222.9	355.0	224.4	75.5
27.1	70.5	69.7	137.0	192.9	264.1	87.3	55.2
12.6	41.3	108.2	107.6	123.9	119.4	33.5	15.6
19.5	0.0	99.3	66.3	130.0	212.1	102.7	32.3
11.0	144.3	134.2	55.8	62.0	82.1	42.5	33.9
13.1	103.9	112.8	86.9	71.6	82.0	56.7	38.3
9.9	107.8	107.3	62.5	89.5	79.8	36.7	29.8
12.8	8.0	63.3	81.4	154.6	97.9	39.5	18.5
10.6	45.8	65.0	91.3	160.9	163.4	106.4	34.8
12.8	128.4	94.6	91.0	194.3	332.7	80.8	37.3
17.4	76.8	78.5	135.1	154.2	205.6	79.0	31.7
12.6	91.5	112.3	104.3	64.3	144.1	76.6	44.3
12.5	172.1	99.2	97.3	124.0	198.5	70.5	49.2
16.4	107.2	110.9	132.3	89.3	87.6	47.9	25.4
5.8	12.1	62.3	120.6	207.9	319.1	163.7	50.8
13.3	312.8	112.7	123.3	189.2	238.4	57.1	41.9
17.1	21.4	118.5	80.0	118.6	143.9	60.3	39.3
11.4	92.5	68.5	45.0	123.7	193.2	49.9	46.0
16.0	49.7	93.4	86.2	178.6	306.0	93.6	66.9
20.4	16.7	97.6	73.0	51.4	89.1	31.3	14.7
6.5	64.3	122.7	66.8	67.5	62.1	56.0	24.9
6.6	4.5	136.6	202.3	202.8	281.9	109.7	29.8
16.9	45.3	132.4	152.7	136.8	344.6	165.9	67.6

442	43.7	24.8	13.0	9.7
443	42.0	22.2	10.4	13.0
444	29.5	19.8	11.5	8.2
445	11.3	2.6	2.2	.3
446	24.7	2.8	1.1	.6
447	36.4	25.8	16.2	13.3
448	0.0	0.0	0.0	0.0
449	28.0	10.9	5.0	3.0
450	31.5	22.1	14.1	8.0
451	27.6	14.1	9.5	6.1
452	23.0	13.2	9.1	6.9
453	26.4	12.2	6.4	3.9
454	24.5	14.8	8.8	6.2
455	20.3	7.5	4.6	2.2
456	42.3	23.6	13.5	10.5
457	21.1	2.0	0.0	0.0
458	36.9	18.3	7.5	5.2
459	44.0	18.5	18.6	7.3
460	40.1	26.0	17.1	12.8
461	36.9	17.9	10.3	7.4
462	34.2	13.4	9.2	5.8
463	30.1	19.9	9.8	6.7
464	49.2	35.7	24.2	19.0
465	32.7	15.5	10.8	7.7
466	34.8	13.7	14.1	10.7
467	15.9	4.6	1.7	.5
468	26.7	14.9	8.2	5.0
469	45.2	17.8	13.6	8.5
470	31.9	0.0	3.1	1.4
471	40.0	22.8	13.2	9.0
472	23.0	15.3	8.3	5.6
473	43.8	18.4	9.4	5.8
474	32.3	10.9	4.9	2.8
475	58.0	25.0	18.8	16.1
476	53.4	37.0	22.2	15.9
477	24.5	19.0	10.7	8.2
478	11.1	4.3	0.0	0.0
479	28.1	20.0	13.8	10.2
480	27.3	13.8	6.6	4.8
481	15.4	14.0	6.0	3.9
482	9.2	0.0	0.0	0.0
483	13.0	5.3	3.5	1.9
484	26.9	17.2	9.5	6.3
485	25.5	8.3	3.0	1.6
486	25.5	11.8	4.4	2.1
487	7.0	9.4	4.8	2.0
488	14.8	0.0	2.3	1.0
489	20.3	9.1	2.8	.6
490	3.0	2.3	0.0	0.0
491	18.6	9.5	6.4	3.5
492	33.9	19.1	10.0	8.5
493	30.6	13.8	7.3	4.6
494	36.4	23.1	13.5	9.7
495	28.3	19.5	13.1	10.3
496	31.6	14.8	9.4	6.0
497	46.1	23.9	19.7	16.8
498	22.3	16.1	7.0	4.1
499	19.6	18.5	13.4	11.1
500	49.3	17.9	10.1	5.6

Cuadro 5 (Conclusión)

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14.6	42.9	131.4	88.3	176.3	217.1	87.7	42.1
16.3	12.7	63.0	57.8	114.9	216.1	63.5	33.0
26.0	587.3	143.0	142.7	93.4	105.7	46.7	22.9
13.2	181.2	114.9	140.5	142.6	125.3	31.9	19.5
7.0	108.9	116.9	136.2	187.7	274.3	93.8	48.8
21.0	35.7	127.8	99.0	80.2	106.6	41.6	16.9
9.1	6.5	76.6	86.2	93.2	171.1	57.4	45.9
21.5	113.6	86.5	70.0	121.3	207.3	60.5	41.1
15.1	64.5	110.1	76.1	123.6	225.7	60.2	39.0
18.7	44.2	71.8	64.6	91.7	180.3	50.9	32.1
12.0	134.7	68.3	137.2	95.6	176.9	82.2	28.0
24.0	96.0	110.7	92.7	127.3	183.6	55.4	30.1
15.0	61.1	155.7	142.9	137.7	124.0	48.9	25.5
11.2	52.3	96.1	162.3	166.9	331.2	128.3	63.9
17.1	63.5	166.3	98.7	129.8	192.5	71.4	44.5
8.8	62.8	82.4	71.5	140.4	160.2	65.8	54.6
18.6	4.1	105.5	76.8	106.0	196.2	86.1	50.4
16.4	41.4	84.1	96.2	133.3	137.4	44.1	41.3
10.4	196.9	122.8	164.7	153.8	217.9	63.6	42.3
7.0	16.8	87.1	68.9	121.9	171.4	128.3	59.3
18.4	362.1	152.0	77.1	57.5	140.6	75.4	31.8
18.6	98.7	126.1	197.5	202.8	240.8	72.0	52.9
19.2	134.4	91.1	71.6	202.3	137.3	53.4	46.8
14.5	45.2	120.6	119.4	118.2	254.4	66.4	49.5
11.4	9.8	104.6	66.2	48.7	76.3	31.7	18.8
13.3	67.5	100.1	56.3	52.6	77.9	63.0	34.0
9.1	92.2	103.3	87.6	129.6	122.2	53.5	64.9
15.0	180.0	87.8	70.9	178.1	213.0	79.1	27.2
13.1	41.9	56.4	78.9	151.7	173.4	84.4	26.1
26.2	163.5	112.5	142.0	157.0	131.2	46.9	27.0
18.9	38.9	72.2	70.3	126.0	168.0	48.1	40.1
14.2	40.2	80.2	51.3	127.5	123.7	66.1	49.8
22.2	61.2	96.3	181.6	119.6	186.2	89.0	66.8
30.5	139.9	103.5	148.1	99.9	230.0	143.2	46.9
28.2	298.7	115.9	69.4	126.3	157.2	54.2	26.9
20.6	89.8	82.0	61.8	172.6	143.3	42.1	26.7
12.0	106.0	103.9	74.0	128.1	133.1	56.9	23.0
15.1	33.6	121.9	141.0	129.0	176.6	47.9	30.1
19.8	55.1	107.3	59.1	42.2	86.3	75.4	36.4
12.3	0.0	76.7	75.4	61.6	59.8	37.1	21.2
13.3	21.8	77.1	60.7	89.9	97.8	43.8	26.8
7.2	157.2	100.6	74.1	54.3	178.0	65.9	29.8
21.8	109.8	105.0	96.2	206.9	239.9	55.8	31.5
16.3	227.5	124.7	78.9	122.8	203.4	71.5	31.4
8.6	49.4	113.0	154.4	144.1	173.4	39.6	19.1
12.5	0.0	86.8	55.7	108.8	157.7	33.9	17.0
13.9	33.6	101.2	57.8	121.2	117.8	45.6	22.3
13.7	99.7	100.4	85.2	178.9	148.1	44.1	21.4
12.1	39.9	118.3	114.2	75.0	73.8	60.5	23.6
8.6	65.9	87.9	83.5	65.9	103.4	76.2	43.5
15.7	311.1	141.4	92.7	156.6	230.1	72.9	47.7
15.7	141.9	121.8	91.1	125.0	175.2	50.4	53.4
15.1	344.4	125.2	208.5	193.6	237.1	65.6	56.7
20.5	416.8	139.5	185.2	120.7	163.3	71.6	41.0
14.6	103.8	140.5	185.5	185.6	229.9	69.8	47.4
15.7	66.2	78.9	87.3	100.2	178.9	62.2	29.2
10.8	30.1	60.3	102.8	93.4	149.8	75.1	46.3
15.7	56.0	107.1	92.4	92.9	124.9	82.9	61.2
11.9	49.7	97.9	89.5	228.2	310.5	154.5	57.7

Cuadro 6

REGISTRO SIMTETICO EN CORRIENTE LIRA (NICARAGUA).
CAPACIDADES ESTADISTICAS DE LOS VOLUMENES GENERADOS

MES	ME DIA	VARIAN CIA	DES V. EST.	COEF. REGR.	COEF. CORR. I.
1	.2772013E+02	.1823052E+03	.1350501E+02	.6653005E+00	.7729363E+00
2	.1470352E+02	.8350064E+02	.9137069E+01	.5816323E+00	.8595039E+00
3	.6483801E+01	.3989599E+02	.6316327E+01	.6645821E+00	.9614636E+00
4	.5884067E+01	.2743489E+02	.6237833E+01	.8212049E+00	.9902709E+00
5	.1493067E+02	.3422338E+02	.5850675E+01	.6518110E+00	.5835949E+00
6	.1014109E+03	.9500327E+04	.9746996E+02	.4835341E+01	.2902136E+00
7	.1061953E+03	.6990341E+03	.2643225E+02	.1258047E+00	.4637469E+00
8	.1057886E+03	.1553224E+04	.3941096E+02	.5528315E+00	.3708728E+00
9	.1369252E+03	.2572313E+04	.5071798E+02	.5344786E+00	.4153224E+00
10	.1757693E+03	.5046667E+04	.7102502E+02	.9541347E+00	.6813267E+00
11	.6978798E+02	.1189333E+04	.3447220E+02	.3199951E+00	.6793114E+00
12	.3702272E+02	.2461735E+03	.1568992E+02	.9571287E+00	.7846444E+00

Cuadro 7
REGISTRO SINIEGYICO EN COMPIENTE LIRA (NICARAGUA)
PROBABILIDADES DE ESCURRIMIENTOS

FEBRERO		MAYO		AGOSTO		NOVIEMBRE		DICIEMBRE	
HASTA	PROB.	HASTA	PROB.	HASTA	PROB.	HASTA	PROB.	HASTA	PROB.
4.1	0.0000	2.7	0.0000	1.9	0.0000	1.6	0.0000	2.0	0.0000
8.2	0.0300	5.5	0.0000	3.8	0.0000	3.0	0.0000	6.0	0.0000
12.4	0.0600	8.2	0.0000	5.7	0.0000	4.8	0.0000	9.0	0.0000
16.5	0.0800	10.9	0.0000	7.6	0.0000	6.4	0.0000	12.0	0.0000
20.6	0.1100	13.6	0.0000	9.5	0.0000	8.0	0.0000	15.0	0.0000
24.7	0.1400	16.3	0.0000	11.4	0.0000	9.6	0.0000	18.0	0.0000
28.9	0.1700	19.1	0.0000	13.3	0.0000	11.2	0.0000	21.0	0.0000
33.0	0.2000	21.8	0.0000	15.2	0.0000	12.8	0.0000	24.0	0.0000
37.1	0.2300	24.5	0.0000	17.1	0.0000	14.4	0.0000	27.0	0.0000
41.2	0.2600	27.3	0.0000	19.0	0.0000	16.0	0.0000	30.0	0.0000
45.3	0.2900	30.0	0.0000	20.8	0.0000	17.5	0.0000	33.0	0.0000
49.5	0.3200	32.7	0.0000	22.7	0.0000	19.2	0.0000	36.0	0.0000
53.6	0.3500	35.5	0.0000	24.6	0.0000	20.8	0.0000	39.0	0.0000
57.7	0.3800	38.2	0.0000	26.5	0.0000	22.4	0.0000	42.0	0.0000
61.8	0.4100	40.9	0.0000	28.4	0.0000	24.0	0.0000	45.0	0.0000
65.9	0.4400	43.6	0.0000	30.3	0.0000	25.6	0.0000	48.0	0.0000
70.1	0.4700	46.3	0.0000	32.2	0.0000	27.2	0.0000	51.0	0.0000
74.2	0.5000	49.1	0.0000	34.1	0.0000	28.8	0.0000	54.0	0.0000
78.3	0.5300	51.8	0.0000	36.0	0.0000	30.4	0.0000	57.0	0.0000
82.5	0.5600	54.5	0.0000	37.9	0.0000	32.0	0.0000	60.0	0.0000
10.8	0.0000	13.6	0.0000	17.2	0.0000	23.5	0.0000	10.4	0.0000
21.6	0.0000	27.2	0.0000	34.5	0.0000	46.9	0.0000	20.7	0.0000
32.4	0.0000	30.9	0.0000	41.7	0.0000	50.4	0.0000	31.1	0.0000
43.2	0.0000	56.4	0.0000	68.9	0.0000	83.8	0.0000	41.4	0.0000
54.0	0.0000	68.1	0.0000	86.1	0.0000	117.3	0.0000	51.8	0.0000
64.8	0.0000	81.7	0.0000	103.4	0.0000	150.8	0.0000	62.1	0.0000
75.6	0.0000	95.1	0.0000	120.5	0.0000	184.2	0.0000	72.5	0.0000
86.4	0.0000	108.9	0.0000	137.6	0.0000	217.7	0.0000	82.8	0.0000
97.2	0.0000	122.5	0.0000	154.7	0.0000	251.1	0.0000	93.2	0.0000
108.0	0.0000	136.1	0.0000	172.3	0.0000	284.5	0.0000	103.5	0.0000
118.8	0.0000	149.7	0.0000	189.8	0.0000	317.9	0.0000	113.9	0.0000
129.6	0.0000	163.3	0.0000	207.3	0.0000	351.3	0.0000	124.2	0.0000
140.4	0.0000	177.0	0.0000	224.8	0.0000	384.7	0.0000	134.6	0.0000
151.2	0.0000	190.6	0.0000	242.3	0.0000	418.1	0.0000	144.9	0.0000
162.0	0.0000	204.2	0.0000	259.8	0.0000	451.5	0.0000	155.3	0.0000
172.8	0.0000	217.8	0.0000	277.3	0.0000	484.9	0.0000	165.6	0.0000
183.6	0.0000	231.4	0.0000	294.8	0.0000	518.3	0.0000	175.9	0.0000
194.4	0.0000	245.0	0.0000	312.3	0.0000	551.7	0.0000	186.3	0.0000
205.2	0.0000	258.6	0.0000	329.8	0.0000	585.1	0.0000	196.7	0.0000
216.0	0.0000	272.2	0.0000	347.3	0.0000	618.5	0.0000	207.0	0.0000

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