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JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

MUNICIPALITY OF LA PAZ
THE REPUBLIC OF BOLIVIA

THE STUDY ON
CONTROL OF WATER CONTAMINATION OF THE RIVERS
IN THE CITY OF LA PAZ

Data Book

MAY 1993

PACIFIC CONSULTANTS INTERNATIONAL

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CONTENTS

1. RESULTS OF WATER QUALITY SURVEYS

1. INTRODUCTION

This report presents the contents and the results of the water quality survey, including the river sediments analysis, which was conducted in the first site study stage of the Study on Control of Water Contamination of the Rivers in the City of La Paz.

In the survey, qualitative and quantitative measurements were conducted for various kinds of water and sediments to understand the actual water pollution conditions and the characteristics of the pollution sources in the study area.

2. RIVER WATER QUALITY SURVEY

2.1 General

The JICA study team and the Bolivian counterpart team together carried out the water quality and flowrate survey at 16 points in Choqueyapu river and its tributaries for four (4) days during March 23 to April 30,1992. The observation points were selected by keeping the water pollution analysis in mind, as shown in Figure 1. Table 1 shows the catchment area, the altitude and the outline of each points.

The river flowrate survey was made four (4) times a day at an interval of six (6) hours with some exception. The flowrate was obtained by multiplication of the area of the river cross section and the flow velocity which was measured by electromagnetic current meter.

The water quality survey was made on the following parameters:

-Water Temperature, pH, DO, BOD, Dissolved BOD, Deoxgen-eration Rate, COD, SS, Number of Coliform Groups, As, Cr6+, Cr, Fe, Mn, Pb, Cd, Hg, Cu, Sn, and Zn (20 items)

The samples were taken at the same time as the flowrate survey. The Water Temperature, pH, DO was examined four (4) times a day on sites at the same time as sampling.

The number of Coliform Groups was analyzed at the laboratory for each of 2 samples taken at a daytime and a nighttime of the day.

The other parameters were measured for the compsit samples prepared by mixing the 4 samples of the day by the ratio of the river flowrate with some exceptions.

2.2 River Flowrate

The results of the river flowrate observation are shown in Table 2 to 5.

The diurnal changes of the river flowrate in the representative points are shown in Figure 2. Roughly speaking, the flowrate do not change greatly in a day in the points which are not much affected by wastewater discharges, whereas the flowrate is greater in daytime and smaller in nighttime in the points such as R4, R5, R9 and R14 which are affected by the activities in the city area.

Figure 3 shows the changes of the daily average flowrate observed in the Choqueyapu river. The daily flowrate increases as the catchment area increases, but in the first survey the flowrate dropped from R2 to R3 and from R14 to R15. The former case was because the Achachicala water purification plant was taking water from the Choqueyapu river when the survey was conducted, and the latter was considered due to the miss-measurement or the effect of unusual flood.

The flowrate increases as the catchment area increases in the rural area, whereas the increase of flowrate in the urban area between R3 and R9 is more than the increase in the catchment area.

2.3 River Water Quality

The results of the river water quality analyses are shown in Table 7 to 10.

(1) pH

The pH values are slightly acidic but are within the water quality standards of Bolivia in all the observation points.

(2) DO

Most of the DO values range from 2.5 to 5.0 mg/l, and increase a little at night at most of points.

Figure 4 shows the changes of DO of the afternoon in the Choqueyapu river.

(3) BOD

Figure 5 shows the changes of BOD in the Choqueyapu river. The BOD values are below 5 mg/l in the upstream, but increase rapidly from R16 to R4. From the points of R5, the values decrease gradually.

The variation of BOD is large in the urbanized area, whereas the variation in the upstream and downstream points is comparatively small.

Further to mention, the BOD value of R3 and R4 in the survey on March 23-24 were high because the Achachicala water purification plant took water from the river.

(4) Dissolved BOD

Table 12 shows the ratio of D-BOD to BOD, which is higher in the upstream than in the downstream.

(5) COD

Figure 6 shows the changes of COD in the Choqueyapu river. The COD values change nearly in the same way as BOD.

(6) SS

Figure 7 shows the changes of SS in the Choqueyapu river. The SS values to the points of R5 have comparatively small margin of variation, whereas they fluctuate considerably by day down the point of R9. The SS values from R3 to R5 range from 250 to 450 mg/l.

(7) Number of coliform groups

The result of the coliform group bacteria test was positive at every point in the Choqueyapu river. But the number of coliform group bacteria is comparatively small at the points of R1, R2 and R10, where artificial effects are considered to be small.

(8) Heavy metals

The observed values over the allowable limits of environmental quality standards in Bolivia are marked in Tables 7-4, 8-4, 9-4, and 10-4 . The values of Fe and Mn exceed the allowable limits at many points. The more important thing is that the concentrations of Pb and Hg are high at some points. Especially, the concentration of Hg at R5, R9 and R14 in in Choqueyapu river are always high.

3. SURVEY OF POLLUTANTS INFLOW TO RIVERS

3.1 General

The Central and South zones of La Paz city are fairly covered by the sewer system. However, domestic wastewater in the Central zone collected by the sewer pipes is drained to small rivers, most of which flow under the ground, and discharged to the Choqueyapu River and its tributaries without treatment.

In the peripheral areas of the Central zone, most of domestic wastewaters are discharged to roads and penetrate into the ground, or discharge into sewers in the case of the South zone.

The study team carried out the water quality and flowrate survey at five (5) sewage discharge points in the urban areas to identify the pollutants inflow into rivers. The survey was conducted four times at an interval of 6 hours from the morning of April 28 to the morning of April 29, 1992. The survey methods are in accordance with that for the river survey. The locations of the sampling points are shown in Figure 8 together with other field survey points. Table 13 shows the outlines of the survey points of sewage inflow.

3.2 Flowrate of Sewage Inflow

The results of the observed flowrate are shown in Table 14-1.

The diurnal changes of the sewage inflows are shown in Figure 9. The volume of flow increases in the daytime and decreases in the nighttime. The ratio of the maxim flowrate to the minimum is 2.05(L1), 2.28(L2), 2.58(L3), 4.86(L4) and 2.26(L5), and 2.81 on the average of 5 points.

3.3 Quality of Sewage Inflow

The observed quality of sewage inflows is shown in Tables 14-2 through 14-5. The sewage inflow at the point of L5 is less polluted than the other four (4) points by judging the values of BOD, COD and SS.

As for the heavy metals, the concentration of Pb in L3 and the concentration of Hg in L3 and L4 show the high levels.

4. RIVER SEDIMENT AND FARMLAND SOIL QUALITY

The study team conducted a survey of river sediment quality at 5 points in the Choqueyapu River on April 29, 1991. A farmland soil was sampled at Mecapaca on April 22, 1992. The locations of the sampling sites are shown in Figure 8. The sediment samples were analyzed for the following parameters at the laboratory.

- Color, Odor, BOD, COD, Ignition Loss, Water Content, As, Cr6+, Cr, Fe, Mn, Pb, Cd, Hg, Cn, Sn, and Zn (17 items).

The parameters analyzed for the farmland soil excluded Color, Odor, BOD, COD and Ignition Loss.

The results are shown in Tables 15-1 and 15-2.

5. OTHER FIELD SURVEY

5.1 General

The study team conducted the analysis of the following water samples:

Irrigation water	1 point (I1)
Well water	2 points (G6,G7)
Spring water	5 points (G1,G2,G3,G4,G5)
Industrial wastewater	3 points (F1,F2,F3)
Mining wastewater	1 point (M1)
River water for irrigation	1 point (R17)

The points of the survey are shown in Figure 8.

The results of the surveys are shown in Tables 16-1, 16-2 and 16-3.

5.2 Irrigation Water Quality

The irrigation water was sampled at the irrigation canal in Mecapaca located in about 9 km down the Choqueyapu river from the Lipari bridge (R15). The sampling was made two times on April 1 and 22, 1992.

The results of DO, BOD, COD and SS were shown in Figures 4 through 7.

5.3 Groundwater Quality

The sampling of the well water and the spring water was conducted on April 8 and 22, 1992. The waters at the points of G1 to G6 were used for drinking water, whereas the water at the point of G7 was used for irrigation when the river water reduces and runs out.

5.4 Industrial Wastewater

The industrial wastewater was sampled at the outlets of three factories on April 14, 1992. The volume of public water consumption is around 364 m3/day for FABRICA INDUPEL, 71 on the average (See Table 16). But the sampled wastewater of FORNO included the domestic wastewater.

The observed BOD, COD and SS show high values as compared with the sewage inflows.

5.5 Mining Wastewater

The mining wastewater was sampled in the stream about 500 meters down from the mine which is located in the upper reach of the Irpavi river.

The company, LA SOLUCION, mines zinc, lead and silver with 58 employees. The wastewater from the dressing facility is treated at the present, but some toxic chemicals such as cyanide are used.

The concentration of Pb, Cd and Hg in the water is fairly high.

5.6 River Water for Irrigation

The river water was sampled on April 29, 1992 at R17 in the Choqueyapu River in Mecapaca. This site is the same as the sampling point of the irrigation water, but the water was sampled from the river directly. The results for DO, BOD, COD and SS were shown in Figs. 4 throuth 7.

TABLE 1 CHARACTERISTICS OF THE SAMPLING POINTS FOR THE RIVER WATER QUALITY

No.	Name of River	Catchment Area (sqkm)	Altitude (m)	Description of the point
R 1	Choqueyapu (Kaluyo)	16.23	4,320	Most upstream of Choqueyapu river. Free from human activities.
R 2	Choqueyapu	107.07	3,860	Near railway crossing. Entrance of the urbanized area.
R 3	Choqueyapu	119.98	3,710	Most upstream of the culverted section.
R 4	Choqueyapu	130.68	3,550	Downstream of the tunnel outlet of the river.
R 5	Choqueyapu	136.85	3,390	At the bridge of Ave. Ejercito. Upstream of the confluence with the Katahuma and the Orkojahuira rivers. Located in the southern part of the central district of the city.
R 6	Kotahuma	5.77	3,390	Upstream to confluence with the Choqueyapu river.
R 7	Orkojahuira	88.23	3,540	Upstream point.
R 8	Orkojahuira	92.54	3,390	Upstream of confluence with the Choqueyapu river.
R 9	Choqueyapu	246.51	3,240	Obrajes. Upstream of confluence with the Irpavi river.
R10	Irpavi	159.51	3,410	4 km upstream from confluence with the Choqueyapu river. Most upstream of the urbanized area.
R11	Irpavi	226.04	3,240	Upstream of confluence with the Choqueyapu river.
R12	Achumani	62.12	3,270	Upstream of confluence with the Irpavi river.
R13	Huanajahuira	18.37	3,230	Upstream of confluence with the Choqueyapu river.
R14	La Paz (Choqueyapu)	501.02	3,170	Flow observation station near the Aranjuez bridge.
R15	La Paz (Choqueyapu)	535.09	3,020	Under Lipari bridge. Most downstream of the study area.
R16	Choqueyapu	114.31	3,830	Upper point of the water intake gate of Achachicala plant.

TABLE 2. Results of the Measurements of the River Flow Rate

(March 23-24, 1992) (Unit:m3/s)

No.	Time	Flowrate	Time	Flowrate	Time	Flowrate	Time	Flowrate	Average
R 1	11:00	0.363	17:00	0.306	-	-	-	-	0.33
R 2	11:50	0.576	18:15	0.628	-	-	-	-	0.60
R 3	13:10	0.145 (*)	18:50	0.138 (*)	22:15	0.122 (*)	4:05	0.084 (*)	0.12
R 4	13:55	0.739	19:50	0.627	23:15	0.451	4:45	0.465	0.57
R 5	14:30	1.398	17:30	1.478	24:00	0.802	5:00	0.765	1.11
R 6	13:25	0.199	17:45	0.230	0:30	0.106	5:30	0.115	0.16
R 7	11:50	0.42	17:00	0.456	22:00	0.286	4:00	0.269	0.36
R 8	12:30	0.643	17:25	0.526	23:00	0.356	4:30	0.377	0.48
R 9	15:15	1.822	18:20	1.686	1:00	1.026	6:00	1.047	1.40
R10	10:30	0.905	16:00	0.708	21:50	0.846	3:45	0.933	0.85
R11	12:05	1.022	16:50	1.019	23:05	0.981	4:40	1.160	1.05
R12	11:25	0.196	16:25	0.131	22:30	0.196	4:10	0.157	0.17
R13	12:50	0.031	17:10	0.032	23:40	0.030	4:55	0.023	0.03
R14	16:00	3.426	18:40	4.478	1:30	2.669	6:30	2.725	3.32
R15	13:50	2.911	17:40	3.004	0:25	2.301	5:40	2.511	2.68

Note : (*) When the survey was conducted, Achachicala water purifi-cation plant had taken water from Choqueyapu river at the point of R16.

TABLE 3. Results of the Measurements of the River Flow Rate

(April 11-12, 1992) (Unit:m3/s)

No.	Time	Flowrate	Time	Flowrate	Time	Flowrate	Time	Flowrate	Average
R 1	10:30	*	17:30	0.218	-	-	-	-	0.22
R 2	12:10	0.507	18:30	0.554	-	-	-	-	0.53
R16	13:05	0.333	19:05	0.652	-	-	-	-	0.49
R 3	14:00	0.759	19:40	0.613	22:55	0.637	-	-	0.67
R 4	15:20	1.145	20:10	1.054	0:15	0.921	4:50	0.834	0.99
R 5	11:15	2.095	16:55	1.936	0:15	1.134	5:00	1.144	1.58
R 6	11:00	0.183	16:40	0.258	23:40	0.128	4:50	0.063	0.16
R 7	10:00	0.239	16:00	0.343	22:15	0.197	4:00	0.173	0.24
R 8	10:35	0.320	16:25	0.463	23:00	0.293	4:20	0.338	0.35
R 9	11:45	2.587	17:30	2.830	1:00	1.289	5:50	1.505	2.05
R10	10:15	0.392	15:45	0.577	22:15	0.826	3:30	0.875	0.67
R11	11:30	0.695	16:35	0.777	23:30	0.759	4:15	0.818	0.76
R12	11:00	0.074	16:15	0.144	23:00	0.075	4:00	0.077	0.09
R13	11:45	0.062	16:50	0.056	23:45	0.048	4:45	0.047	0.05
R14	12:15	2.918	18:10	3.443	1:45	1.980	6:20	1.878	2.55
R15	11:20	2.729	17:25	3.365	0:30	2.979	5:15	3.032	3.03

TABLE 4. Results of the Measurements of the River Flow Rate

(April 22-23, 1992) (Unit:m3/s)

No.	Time	Flowrate	Time	Flowrate	Time	Flowrate	Time	Flowrate	Average
R 1	10:55	0.013	17:40	0.199	-	-	-	-	0.11
R 2	11:55	0.252	18:20	0.360	-	-	-	-	0.31
R16	12:55	0.275	18:40	0.334	-	-	-	-	0.30
R 3	13:05	0.644	19:10	0.495	23:00	0.585	05:00	0.738	0.62
R 4	13:40	1.128	19:40	1.524	23:30	0.682	05:15	0.796	1.03
R 5	11:15	1.902	17:20	1.154	23:30	1.145	05:05	1.049	1.31
R 6	11:00	0.188	16:40	0.280	23:10	0.164	04:50	0.149	0.20
R 7	10:00	0.241	16:00	0.282	22:15	0.299	04:00	0.254	0.27
R 8	10:40	0.274	16:25	0.320	22:50	0.298	04:25	0.214	0.28
R 9	12:05	1.831	17:15	1.946	00:20	1.060	06:05	1.357	1.55
R10	10:10	0.677	16:10	0.631	22:15	1.135	04:00	0.851	0.82
R11	11:15	0.400	17:05	0.478	00:10	0.826	05:00	0.715	0.60
R12	10:55	0.063	16:55	0.037	23:45	0.043	04:35	0.043	0.05
R13	11:40	0.016	17:25	0.023	00:30	0.037	05:20	0.016	0.02
R14	12:30	2.457	18:10	2.993	00:45	2.270	06:30	2.183	2.48
R15	12:20	2.665	17:40	2.837	01:00	2.920	06:30	2.870	2.82

TABLE 5. Results of the Measurements of the River Flow Rate

(April 29-30, 1992) (Unit:m3/s)

No	Time	Flowrate	Time	Flowrate	Time	Flowrate	Time	Flowrate	Average
R 1	11:40	0.079	16:15	0.077	-	-	-	-	0.08
R 2	12:20	0.121	17:05	0.210	-	-	-	-	0.17
R16	12:45	0.202	17:30	0.285	-	-	-	-	0.24
R 3	13:10	0.280	-	-	23:00	0.349	-	-	0.31
R 4	13:40	0.806	18:10	0.772	23:40	0.698	04:30	0.687	0.74
R 5	11:35	1.351	17:00	1.585	23:15	1.131	05:25	1.287	1.34
R 6	11:20	0.201	16:45	0.279	23:00	0.179	05:05	0.095	0.19
R 7	10:30	0.265	16:00	0.270	22:00	0.199	04:00	0.171	0.23
R 8	11:00	0.392	16:20	0.469	22:35	0.385	04:45	0.231	0.37
R 9	12:15	1.315	17:30	2.439	23:55	0.997	05:40	1.573	1.58
R10	10:45	0.534	16:00	0.393	21:55	0.657	03:45	0.575	0.54
R11	11:45	0.502	16:45	0.546	23:00	0.565	04:45	0.615	0.56
R12	11:15	0.051	16:25	0.093	22:40	0.048	04:20	0.068	0.07
R13	12:00	0.038	16:55	0.032	23:20	0.024	05:00	0.033	0.03
R14	13:00	2.913	18:00	3.034	00:30	2.596	06:30	1.949	2.62
R15	12:30	3.401	17:25	3.440	23:55	2.964	05:30	2.199	3.00

TABLE 7-1 Water Temperature and pH Observed on Site
(March 23-24, 1992)

No	Water temperature (°C)				p H			
	noon	evening	night	morning	noon	evening	night	morning
R 1	12	11	-	-	7.38	6.91	-	-
R 2	12.7	12.9	-	-	7.80	7.43	-	-
R 3	15.4	13.4	12.1	6.5	7.53	8.38	8.32	8.26
R 4	16.8	14.3	13.4	12.5	8.61	8.84	8.32	8.06
R 5	17.2	15.3	13.3	11.7	8.59	8.41	8.45	8.36
R 6	17.4	15.0	13.4	10.1	8.35	8.18	8.21	8.49
R 7	13.1	15.7	10.7	9.7	8.18	8.43	8.16	8.13
R 8	15.3	15.1	10.9	9.6	8.27	8.30	8.36	8.30
R 9	17.9	14.8	12.0	11.1	8.37	8.38	8.46	8.45
R10	11.5	17.7	11.8	9.2	7.44	8.19	7.82	7.80
R11	18.3	18.2	11.5	10.2	8.12	8.23	8.01	8.03
R12	18.3	20.1	11.9	10.2	8.12	8.06	7.89	7.95
R13	22.2	20.2	12.5	11.2	8.02	7.85	8.08	8.15
R14	19.2	14.7	11.2	11.0	8.22	8.16	8.29	8.29
R15	19.6	17.2	11.4	11.1	8.31	7.85	8.00	8.11

TABLE 7-2 DO Observed on Site
(March 23-24, 1992)

No	DO observed (mg/l)				DO revised (mg/l)			
	noon	evening	night	morning	noon	evening	night	mornig
R 1	9.58	9.4	-	-	5.7	5.6	-	-
R 2	10.27	9.65	-	-	6.5	6.1	-	-
R 3	8.61	9.59	9.76	8.89	5.5	6.2	6.3	5.7
R 4	9.92	9.94	9.42	9.74	6.5	6.5	6.2	6.4
R 5	7.22	4.45	4.66	5.03	4.8	3.0	3.0	3.4
R 6	6.29	5.55	6.50	7.77	4.2	3.7	4.3	5.2
R 7	6.50	5.55	6.57	6.62	4.3	3.6	4.3	4.3
R 8	5.41	6.79	6.71	7.22	3.6	4.5	4.5	4.8
R 9	4.97	5.41	6.00	6.79	3.4	3.7	4.1	4.6
R10	9.57	6.71	6.78	7.10	6.4	4.5	4.5	4.7
R11	6.97	6.53	7.63	7.31	4.7	4.4	5.2	5.0
R12	6.58	5.80	7.82	6.71	4.5	3.9	5.3	4.6
R13	4.10	3.93	6.06	5.58	2.8	2.7	4.1	3.8
R14	4.74	6.15	5.90	6.28	3.3	4.2	4.1	4.3
R15	6.70	5.55	7.36	7.15	4.7	3.9	5.1	5.0

Notes : 1. Measured DO show the observation values in the actual survey.
2. Revised DO are calculated by the following equation to revise the effect of altitudes.

DO1 = 1/(10^(h/19410.16))*DO2
DO1: Revised DO (mg/l)
DO2: Observed DO (mg/l)
h: Altitude (m)

TABLE 7-3 Results of the River Water Quality Analysis(General)
(March 23-24, 1992)

No	p H	BOD (mg/l)	D-BOD (mg/l)	COD (mg/l)	S S (mg/l)	Coliform cells/100ml
R1	7.2	3.3	1.3	436	3.3	1.00E+02
R2	7.4	5.1	1.6	8	349	1.00E+02
R3	8.5	305	34	489	358	2.00E+05
R4	7.3	313	34	510	273	1.82E-05
R5	7.3	233	26.5	438	305	8.60E+05
R6	7.7	101	9.4	200	250	6.50E+05
R7	7.5	70	13	127	850	1.06E+05
R8	7.6	89	17.5	148	756	3.60E+06
R9	7.5	185	22	280	654	1.63E+07
R10	8.0	7.5	1	5.1	118	1.70E+03
R11	7.8	28	3.4	10.3	352	1.39E+05
R12	7.7	28	4	45.3	160	2.50E+05
R13	7.6	101	9	173	298	9.60E+05
R14	7.5	69	16.6	146	400	7.30E+05
R15	7.7	77	7	98.9	465	6.00E+05

Note : pH shows the values analyzed as the integrated samples in the laboratory.

TABLE 7-4 Results of the River Water Quality Analysis(Heavy metals-1)
(March 23-24, 1992)

No	As (mg/l)	Cr6 (mg/l)	Cr (mg/l)	Fe (mg/l)	Mn (mg/l)	Pb (mg/l)	Cd (mg/l)	Hg (mg/l)	Cu (mg/l)	Sn (mg/l)	Zn (mg/l)
R1	0.017	<0.04	<0.04	0.13	<0.04	<0.08	<0.01	<0.0005	<0.04	< 1	<0.04
R2	0.006	<0.04	<0.04	10.8 *D	0.22	<0.08	<0.01	<0.0005	<0.04	< 1	0.17
R3	<0.005	<0.04	0.07	4.3 *B	2.48 *B	<0.08	0.03 *B	<0.0005	0.16	< 1	1.14
R4	<0.005	<0.04	<0.04	3.2 *B	0.62 *	<0.08	<0.01	<0.0005	0.05	< 1	0.94
R5	0.01	<0.04	0.08	3.4 *B	0.64 *	<0.08	<0.01	0.001 *	0.05	< 1	0.82
R6	<0.005	<0.04	0.04	72.9 *D	1.01 *A	0.12 *A	<0.01	0.0009	0.1	< 1	0.38
R7	0.015	<0.04	0.06	33.7 *D	0.74 *	<0.08	<0.01	<0.0005	<0.04	< 1	0.12
R8	0.016	<0.04	0.18	25.9 *D	0.66 *	<0.08	<0.01	<0.0005	<0.04	< 1	0.12
R9	0.017	<0.04	0.27	17.7 *D	0.7 *	<0.08	<0.01	0.0006	<0.04	< 1	0.83
R10	0.007	<0.04	<0.04	6.4 *C	0.27	<0.08	<0.01	<0.0005	<0.04	< 1	0.13
R11	0.019	<0.04	<0.04	18.4 *D	0.38	<0.08	<0.01	<0.0005	<0.04	< 1	0.17
R12	0.019	<0.04	<0.04	6.3 *C	0.13	<0.08	<0.01	<0.0005	<0.04	< 1	<0.04
R13	0.013	<0.04	<0.04	5.7 *C	0.21	<0.08	<0.01	<0.0005	<0.04	< 1	0.06
R14	0.01	<0.04	0.13	16.3 *D	0.54 *	<0.08	<0.01	0.0009	<0.04	< 1	0.7
R15	0.016	<0.04	<0.04	15.5 *D	0.66 *	<0.08	<0.01	<0.0005	<0.04	< 1	0.75

Note : * Exceeds the environmental Standards for Special Class
*A Exceeds the environmental Standards for Class A
*B Exceeds the environmental Standards for Class B
*C Exceeds the environmental Standards for Class C
*D Exceeds the environmental Standards for Class D

TABLE 8-1 Water Temperature and pH Observed on Site
(April 1-2, 1992)

No	Water temperature (°C)				pH			
	noon	evening	night	morning	noon	evening	night	morning
R 1	9.2	5.0	-	-	7.20	7.38	-	-
R 2	10.1	9.7	-	-	7.74	7.79	-	-
R16	11.2	9.6	-	-	7.90	7.89	-	-
R 3	11.8	9.8	8.4	-	8.17	8.15	8.28	-
R 4	13.6	12.0	10.4	9.4	8.47	8.38	8.23	8.05
R 5	12.9	14.2	11.9	10.7	8.68	8.51	8.43	8.33
R 6	15.8	14.2	11.0	10.0	8.62	8.60	8.64	8.65
R 7	13.3	13.6	9.9	9.3	9.02	8.49	8.55	8.43
R 8	13.0	14.0	10.5	9.5	8.74	8.56	8.53	8.52
R 9	14.9	14.2	11.8	10.5	8.71	8.46	8.48	8.49
R10	11.6	13.6	8.7	10.5	8.30	8.38	8.23	8.08
R11	18.2	15.5	9.9	11.2	9.21	8.61	8.49	8.56
R12	18.5	16.6	10.8	12.5	8.76	8.10	8.66	8.60
R13	21.3	16.7	12.8	11.8	8.89	8.61	8.71	8.75
R14	16.4	14.6	11.5	10.6	8.53	8.26	8.30	8.37
R15	17.3	15.6	12.3	11.1	8.79	8.79	8.65	8.76

TABLE 8-2 DO Observed on Site
(April 1-2, 1992)

No	DO observed (mg/l)				Do revised (mg/l)			
	noon	evening	night	morning	noon	evening	night	morning
R 1	6.68	5.61	-	-	4.0	3.4	-	-
R 2	6.46	6.04	-	-	4.1	3.8	-	-
R16	6.10	7.42	-	-	3.9	4.7	-	-
R 3	5.83	6.35	6.29	-	3.8	4.1	4.1	-
R 4	5.80	5.65	5.41	5.57	3.8	3.7	3.6	3.7
R 5	5.28	6.02	5.13	5.80	3.5	4.0	3.4	3.9
R 6	5.73	7.10	6.87	6.58	3.8	4.7	4.6	4.4
R 7	5.78	6.17	6.27	6.24	3.8	4.1	4.1	4.1
R 8	6.35	6.70	6.93	6.05	4.2	4.5	4.6	4.0
R 9	5.98	6.46	5.58	5.90	4.1	4.4	3.8	4.0
R10	7.62	5.95	6.70	6.32	5.1	4.0	4.5	4.2
R11	5.88	5.89	6.95	6.30	4.0	4.0	4.7	4.3
R12	5.00	1.27	6.62	6.46	3.4	0.9	4.5	4.4
R13	3.15	4.00	4.72	5.38	2.1	2.7	3.2	3.7
R14	4.91	6.03	5.62	5.80	3.4	4.1	3.9	4.0
R15	5.35	6.27	6.16	6.27	3.7	4.4	4.3	4.4

Notes : 1. Measured DO show the observation values in the actual survey.
2. Revised DO are calculated by the following equation to revise the effect of altitudes.

DO1=1/(10^(h/19410.16))*DO2

DO1: REvised DO (mg;l)
DO2: Observed DO (mg/l)

h: Altitude (m)

TABLE 8-3 Results of the River Water Quality Analysis(General)
(April 1-2, 1992)

No	p H	BOD	D-BOD	COD	S S	Coliform
		mg/l	mg/l	mg/l	mg/l	cells/100ml
R 1	7.6	1.5	<1	2.1	1.8	2.00E+02
R 2	7.7	2.1	<1	6.2	347	1.90E+03
R16	7.6	3.4	<1	8.2	592	4.00E+04
R3	7.8	23	1.5	39.2	472	3.00E+05
R 4	7.4	126	27.5	227	276	1.00E+06
R 5	7.5	180	26.3	294	334	2.40E+06
R 6	7.8	96.5	14.3	204	6,570	2.10E+06
R 7	7.6	76.5	15.1	190	1,350	1.20E+06
R 8	7.6	105	17.9	192	1,500	1.50E+06
R 9	7.6	170	15.5	289	825	2.40E+06
R10	7.7	2.4	1.3	3.6	180	2.80E+03
R11	7.8	15.5	1.6	12.9	231	2.20E+05
R12	7.7	152	6.8	303	1,640	1.00E+06
R13	7.8	138	18.7	274	584	3.60E+06
R14	7.6	108	10.3	247	875	7.40E+05
R15	7.6	80.5	5.0	171	1,810	5.50E+06

Notes : pH shows the values analyzed as the integrated samples in the lab.

TABLE 8-4 Results of the River Water Quality Analysis(Heavy metals-1)
(April 1-2, 1992)

No	As	Cr6+	Cr	Fe	Mn	Pb	Cd	Hg	Cu	Sn	Zn
	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
R 1	<0.005	<0.04	<0.04	0.1 4	<0.04	<0.08	<0.01	< 0.0002	<0.04	< 1	<0.04
R 2	0.006	<0.04	<0.04	15.5 *D	0.31	<0.08	<0.01	< 0.0002	<0.04	< 1	0.22
R16	<0.005	<0.04	<0.04	23.0 *D	0.43	<0.08	<0.01	< 0.0002	<0.04	< 1	0.30
R 4	0.013	<0.04	0.04	8.2 *C	0.38	<0.08	<0.01	0.0003	<0.04	< 1	0.63
R 5	0.006	<0.04	<0.04	6.8 *C	0.36	<0.08	<0.01	0.0018 *	<0.04	< 1	0.60
R 6	0.017	<0.04	150 *D	1.8 *A	0.14 *A	<0.01	0.05*C	0.21	<1	0.63	
R 7	0.021	<0.04	0.13	60.3 *D	1.26 *A	<0.08	<0.01	0.0005	0.12	< 1	0.21
R 8	0.019	<0.04	0.18	64.7 *D	1.34 *A	<0.08	<0.01	0.0008	0.42	< 1	0.29
R 9	0.014	<0.04	0.07	27.6 *D	0.69	<0.08	<0.01	0.0039 *	0.14	< 1	0.59
R10	0.017	<0.04	<0.04	9.2 *C	0.24	<0.08	<0.01	< 0.0002	<0.04	< 1	0.15
R11	0.021	<0.04	<0.04	11.1 *D	0.18	<0.08	<0.01	0.0002	<0.04	< 1	0.06
R12	0.021	<0.04	<0.04	76.9 *D	1.01 *A	0.10	<0.01	0.0011 *	0.08	< 1	0.51
R13	0.009	<0.04	<0.04	16.7 *D	0.37	<0.08	<0.01	0.0008	<0.04	< 1	0.14
R14	0.009	<0.04	0.07	28.7 *D	0.72	<0.08	<0.01	0.0035 *	0.09	< 1	0.51
R15	0.020	<0.04	0.06	55.7 *D	1.02 *A	<0.08	<0.01	0.0032 *	0.06	< 1	0.74

Note : * Exceeds the environmental Standards for Special Class
* A Exceeds the environmental Standards for Special Class A
* B Exceeds the environmental Standards for Special Class B
* C Exceeds the environmental Standards for Special Class C
* D Exceeds the environmental Standards for Special Class D

TABLE 9-1 Water Temperature and pH Observed on Site
(April 22-23, 1992)

No	Water temperature (°C)				pH			
	noon	evening	night	morning	noon	evening	night	morning
R 1	6.85	10.8	-	-	7.25	7.30	-	-
R 2	8.8	9.4	-	-	7.81	7.67	-	-
R16	9.6	8.8	-	-	7.85	7.56	-	-
R 3	10.9	9.3	7.4	5.1	9.83	8.25	8.17	8.29
R 4	12.85	11.9	10.6	9.5	8.40	8.34	8.44	8.34
R 5	11.7	13.7	11.6	10.6	9.12	8.98	8.98	9.14
R 6	15.0	15.3	11.2	9.8	8.87	8.63	8.97	8.84
R 7	10.3	14.8	9.7	8.0	9.32	8.81	8.84	8.73
R 8	10.0	14.3	9.8	9.0	9.26	8.89	9.03	8.79
R 9	13.5	14.3	11.2	10.4	9.20	8.78	8.89	9.21
R10	7.9	14.1	9.6	7.5	9.55	9.86	*	*
R11	15.6	15.0	9.6	8.8	9.96	9.86	*	*
R12	16.6	16.0	9.6	10.3	9.96	9.83	*	*
R13	20.0	16.8	12.1	11.3	10.08	8.80	*	
R14	16.4	14.0	10.7	10.2	8.96	8.61	8.63	8.72
R15	16.0	14.8	11.2	10.6	10.02	9.41	*	

TABLE 9-2 DO Observed on Site
(April 22-23, 1992)

No	DO observed (mg/l)				DO revised(mg/l)			
	noon	evening	night	morning	noon	evening	night	morning
R 1	3.68	3.83	-	-	2.2	2.3	-	-
R 2	3.99	4.38	-	-	2.5	2.8	-	-
R16	3.99	5.01	-	-	2.5	3.2	-	-
R 3	4.24	4.32	4.35	4.73	2.7	2.8	2.8	3.0
R 4	3.52	4.70	3.81	4.13	2.3	3.1	2.5	2.7
R 5	4.20	5.35	4.91	5.24	2.8	3.6	3.3	3.5
R 6	3.38	4.94	5.56	5.87	2.3	3.3	3.7	3.9
R 7	3.36	5.84	5.85	5.94	2.2	3.8	3.8	3.9
R 8	4.41	5.85	6.07	5.95	2.9	3.9	4.1	4.0
R 9	4.78	5.33	5.36	5.72	3.3	3.6	3.6	3.9
R10	6.04	5.55	6.32	6.00	4.0	3.7	4.2	4.0
R11	5.65	5.84	7.01	6.60	3.8	4.0	4.8	4.5
R12	4.19	3.87	5.44	5.32	2.8	2.6	3.7	3.6
R13	2.21	3.29	4.58	5.17	1.5	2.2	3.1	3.5
R14	3.40	4.21	5.48	5.73	2.3	2.9	3.8	3.9
R15	4.74	3.62	6.20	6.40	3.3	2.5	4.3	4.5

Notes : 1. Measured DO show the observation values in the actual survey.

2. Revised DO are calculated by the following equation to revise the effect of altitudes.

DO1=1/(10^(h/19410.16))*DO2

DO1: Revised DO (mg/l)

DO2: Observed DO (mg/l)

h: Altitude (m)

TABLE 9-3 Results of the River Water Quality Analysis (General)

(April 22-23, 1992)

No	p H	BOD	D-BOD	COD	S S	Coliform
		(mg/l)	(mg/l)	(mg/l)	(mg/l)	cells/100ml
R 1	7.2	1.3	<1	1.5	7.2	1.30E+03
R 2	7.5	2.2	1.2	5.6	416	1.30E+03
R16	7.5	2.4	1.3	7.6	228	6.60E+04
R3	9.5	117	68	252	269	1.20E+05
R 4	7.1	115	30	244	282	2.90E+06
R 5	7.3	127	35	309	345	1.10E+06
R 6	7.7	57	5.1	175	3,170	3.60E+06
R 7	7.6	24	9.5	147	1,530	1.70E+06
R 8	7.8	59	9.1	179	1,640	2.20E+06
R 9	7.6	109	20	269	1,100	3.00E+06
R10	7.9	2.1	<1	3.6	201	4.20E+03
R11	7.8	3.9	1.3	13.2	432	4.00E+05
R12	7.7	51	7.1	126	307	2.00E+06
R13	7.7	101	16	240	620	5.30E+06
R14	7.6	75	6.8	176	880	1.50E+06
R15	7.6	51	3.5	146	740	8.60E+05

Notes : pH shows the values analyzed as the integrated samples in the lab.

TABLE 9-4 Results of the River Water Quality Analysis(Heavy metals-1)

(April 22-23, 1992)

No	As (mg/l)	Cr6+ (mg/l)	Cr (mg/l)	Fe (mg/l)	Mn (mg/l)	Pb (mg/l)	Cd (mg/l)	Hg (mg/l)	Cu (mg/l)	Sn (mg/l)	Zn (mg/l)
R 1	<0.005	<0.02	<0.04	0.3 9	<0.04	<0.08	<0.01	<0.0002	<0.04	< 1	<0.04
R 2	<0.005	<0.02	<0.04	20 *D	0.45	<0.08	<0.01	<0.0002	<0.04	< 1	0.48
R16	<0.005	<0.02	<0.04	8.9 *C	0.24	<0.08	<0.01	0.0003	<0.04	< 1	0.30
R 4	0.011	<0.02	0.07	5.9 *C	0.54 *	<0.08	<0.01	0.0004	<0.04	< 1	0.71
R 5	0.008	<0.02	0.10	5.5 *C	0.75 *	<0.08	<0.01	0.001 *	<0.04	< 1	0.88
R 6	0.020	<0.02	0.06	85 *D	1.43 *A	0.11 *A	<0.01	0.0013 *	0.08	< 1	0.47
R 7	0.006	<0.02	0.16	63 *D	1.53 *A	<0.08	<0.01	0.0004	0.04	< 1	0.21
R 8	0.006	<0.02	0.26	59 *D	1.49 *A	<0.08	<0.01	0.0007	0.04	< 1	0.25
R 9	0.006	<0.02	0.11	28 *D	1.02 *A	<0.08	<0.01	0.0009	<0.04	< 1	0.75
R10	<0.005	<0.02	<0.04	9.1 *C	0.20	<0.08	<0.01	<0.0002	<0.04	< 1	0.12
R11	0.013	<0.02	<0.04	25 *D	0.40	<0.08	<0.01	0.0002	<0.04	< 1	0.13
R12	0.011	<0.02	<0.04	11 *D	0.29	<0.08	<0.01	0.0004	<0.04	< 1	0.11
R13	0.005	<0.02	<0.04	14 *D	0.34	<0.08	<0.01	0.0008	<0.04	< 1	0.13
R14	0.009	<0.02	0.08	32 *D	0.96 *	<0.08	<0.01	0.0007	<0.04	< 1	0.68
R15	0.009	<0.02	0.08	23 *D	1.23 *A	<0.08	<0.01	0.0005	<0.04	< 1	0.83

Note : * Exceeds the environmental Standards for Special Class
*A Exceeds the environmental Standards for Special Class A
*B Exceeds the environmental Standards for Special Class B
*C Exceeds the environmental Standards for Special Class C
*D Exceeds the environmental Standards for Special Class D

TABLE 10-1 Water Temperature and pH Observed on Site
(April 29-30, 1992)

No	Water temperature (°C)				pH			
	noon	evening	night	morning	noon	evening	night	morning
R 1	7.4	12.0	-	-	6.87	6.78	-	-
R 2	9.5	10.2	-	-	7.64	7.13	-	-
R16	10.2	9.4	-	-	7.75	7.19	-	-
R 3	11.7	-	6.1	-	8.04	-	7.60	-
R 4	12.8	12.5	*	8.5	8.36	7.95	7.97	7.86
R 5	*	13.5	10.8	9.0	*	8.49	6.53	6.73
R 6	14.0	14.5	9.9	7.0	8.37	8.24	6.64	6.84
R 7	10.8	14.6	9.6	7.2	8.71	8.48	6.71	6.55
R 8	10.2	13.6	9.8	6.9	8.56	8.45	6.56	6.79
R 9	13.7	14.6	11.0	8.5	8.80	8.37	6.51	6.71
R10	10.0	15.3	8.9	5.9	8.00	8.18	7.78	7.91
R11	16.5	16.2	9.8	7.0	8.17	8.02	8.03	8.02
R12	16.5	17.4	10.5	8.1	8.15	8.04	8.07	8.11
R13	20.0	17.8	11.5	8.9	8.00	7.78	8.04	8.10
R14	16.5	14.0	10.5	7.6	8.60	8.25	6.52	6.86
R15	15.9	16.1	11.3	9.2	8.05	7.93	9.74	8.07

TABLE 10-2 DO Observed on Site
(April 29-30, 1992)

No	DO observed (mg/l)				DO revised (mg/l)			
	noon	evening	night	morning	noon	evening	night	morning
R 1	7.10	5.23	-	-	4.3	3.1	-	-
R 2	6.58	6.28	-	-	4.2	4.0	-	-
R16	6.49	6.43	-	-	4.1	4.1	-	-
R 3	7.32	-	6.96	-	4.7	-	4.5	-
R 4	5.33	6.56	5.22	6.30	3.5	4.3	3.4	4.1
R 5		3.31	4.12	4.80		2.2	2.8	3.2
R 6	2.41	3.69	5.25	5.87	1.6	2.4	3.5	3.9
R 7	3.98	3.72	5.74	6.12	2.6	2.4	3.8	4.0
R 8	4.30	4.85	5.81	6.02	2.9	3.2	3.9	4.0
R 9	3.62	4.21	4.79	5.10	2.5	2.9	3.3	3.5
R10	4.46	5.30	5.13	6.14	3.0	3.5	3.4	4.1
R11	4.31	5.14	5.95	4.39	2.9	3.5	4.1	3.0
R12	3.74	4.17	5.10	4.07	2.5	2.8	3.5	2.8
R13	3.16	2.27	4.38	3.50	2.2	1.5	3.0	2.4
R14	2.99	3.70	4.50	5.92	2.1	2.5	3.1	4.1
R15	4.23	3.80	4.71	3.87	3.0	2.7	3.3	2.7

Notes : 1. Measured DO show the observation values in the actual survey.
2. Revised DO are calculated by the following equation to revise the effect of altitudes.

DO1=1/(10^(h/19410.16))*DO2

DO1: Revised DO (mg/l)
DO2: Observed DO (mg/l)

h: Altitude (m)

TABLE 10-3 Results of the River Water Quality Analysis(General)

(April 29-30, 1992)

No	p H	BOD (mg/l)	D-BOD (mg/l)	COD (mg/l)	SS (mg/l)	Coliform cells/100ml
R 1	7.7	<1	<1	1.0	1.8	0.00E+00
R 2	7.6	2.1	1.3	5.1	347	1.20E+03
R16	7.6	5.7	1.5	10.4	235	1.50E+05
R3	8.2	125	41	228	352	7.50E+05
R 4	7.6	169	60	361	354	2.40E+06
R 5	8.0	151	56	298	268	3.50E+06
R 6	8.0	57	12	170	2,440	2.80E+06
R 7	7.8	133	38	309	1,270	1.80E+06
R 8	8.2	55	14	165	1,590	1.60E+07
R 9	8.1	97	34	257	774	4.40E+06
R10	8.0	1.8	1.6	4.1	155	6.40E+03
R11	7.9	6.5	3.1	18.3	576	4.20E+05
R12	7.8	52	8.9	96.7	474	4.30E+06
R13	7.7	109	22	244	394	5.10E+06
R14	7.9	76	24	186	791	5.20E+06
R15	7.7	58	9.6	140	655	5.20E+06

Notes : pH shows the values analyzed as the integrated samples in the lab.

TABLE10-4 Results of the River Water Quality Analysis(Heavy metals-1)

(April 29-30, 1992)

No	As (mg/l)	Cr+6 (mg/l)	Cr (mg/l)	Fe (mg/l)	Mn (mg/l)	Pb (mg/l)	Cd (mg/l)	Hg (mg/l)	Cu (mg/l)	Sn (mg/l)	Zn (mg/l)
R 1	<0.005	<0.02	<0.04	0.2 8	<0.04	<0.08	<0.01	0.0002	<0.04	< 1	<0.04
R 2	<0.005	<0.02	<0.04	14.3 *D	0.31	<0.08	<0.01	0.0004	<0.04	< 1	0.27
R16	<0.005	<0.02	<0.04	9.1 *C	0.16	<0.08	<0.01	0.0004	<0.04	< 1	0.13
R 4	<0.005	<0.02	0.04	7.1 *C	1.24 *A	<0.08	<0.01	0.0010 *	0.05	< 1	1.09
R 5	<0.005	<0.02	0.08	4.4 *B	0.83 *	<0.08	<0.01	0.0012 *	<0.04	< 1	0.90
R 6	0.006	<0.02	0.06	112.0 *D	1.41 *A	0.12 *A	<0.01	0.0035 *	0.11	< 1	0.66
R 7	0.008	<0.02	0.14	51.1 *D	1.03 *A	0.21 *C	<0.01	0.0018 *	0.05	< 1	0.29
R 8	0.000	<0.02	0.15	46.3 *D	1.35 *A	0.21 *C	<0.01	0.0012 *	0.07	< 1	0.47
R 9	0.005	<0.02	0.15	23.6 *D	1.00 *A	<0.08	<0.01	0.0011 *	0.04	< 1	0.79
R10	<0.005	<0.02	<0.04	2.5 *B	0.15	<0.08	<0.01	0.0002	<0.04	< 1	0.09
R11	<0.005	<0.02	<0.04	23.9 *D	0.41	<0.08	<0.01	0.0004	<0.04	< 1	0.15
R12	0.006	<0.02	<0.04	16.5 *D	0.36	<0.08	<0.01	0.0009	<0.04	< 1	0.11
R13	<0.005	<0.02	<0.04	8.2 *C	0.29	<0.08	<0.01	0.0017 *	<0.04	< 1	0.19
R14	<0.005	<0.02	0.13	26.7 *D	1.05 *A	<0.08	<0.01	0.0013 *	0.004	< 1	0.79
R15	0.005	<0.02	0.17	23.1 *D	0.75 *	<0.08	<0.01	0.0012 *	<0.04	< 1	0.47

Note : * Exceeds the environmental Standards for Special Class

*A Exceeds the environmental Standards for Special Class A

*B Exceeds the environmental Standards for Special Class B

*C Exceeds the environmental Standards for Special Class C

*D Exceeds the environmental Standards for Special Class D

TABLE 11 Measured Deoxygenation Rate of the River Water and Irrigation Water

(Unit : 1/day)

No	Sampling Date			
	March 23-24	April 1-2	April 22-23	April 29-30
R4	0.130	0.132	0.122	0.112
R5	0.138	0.130	0.118	0.130
R6	0.236	0.128	0.146	0.104
R8	0.129	0.115	0.115	0.128
R9	0.156	0.132	0.143	0.125
R11	0.128	0.127	0.104	0.112
R14	0.128	0.118	0.118	0.111
R15	0.110	0.115	0.104	0.112
I1	-	0.156	0.104	-

TABLE 12 Ratio of D-BOD to BOD

(%)

No	March 22-23	April 1-2	April 22-23	April 22-23	Average
R1	39.4	*	*	*	39.4
R2	31.4	*	54.5	61.9	49.3
R16	9.1	*	54.2	26.3	29.9
R3	11.1	6.5	45.4	17.8	25.4
R4	10.9	21.8	26.1	35.5	23.6
R5	11.4	14.6	27.6	37.1	22.7
R6	9.3	14.8	8.9	21.1	13.5
R7	18.6	19.7	39.6	28.6	26.6
R8	19.7	17.0	15.4	25.5	19.7
R9	11.9	9.1	18.3	35.1	18.6
R10	13.3	54.2	*	88.8	52.1
R11	12.1	10.3	33.3	47.7	25.9
R12	14.3	4.5	13.9	17.1	12.5
R13	8.9	13.6	15.8	20.2	14.6
R14	24.1	9.5	9.1	31.6	18.6
R15	9.1	6.2	6.9	17.1	9.8

Note : * Impossible to calculate

TABLE 13 CHARACTERISTICS OF THE SAMPLING POINTS OF SEWAGE INFLOW

Point No	Name	Altitude (m)	Observation Point
L1	Apumalla River	3,620	Manhole at Calle Dr. Jose Indaleico
L2	Karahuichinka River	3,580	Manhole at Ave. 16 de Julio
L3	San Pedro River	3,540	Outlet to the Choqueyapu river, near
L4	Soqueri River	3,460	Outlet to the Choqueyapu river.
L5	Sewer pipe in Calacoto	3,230	Outlet to the Choqueyapu river, near crossing of Ave. Sanches bustamante.

TABLE 14-1 Flowrates of Sewage Inflows

(April 28-29, 1992)

(m3/s)

Point	A		B		C		D		
No	Time	Flowrate	Time	Flowrate	Time	Flowrate	Time	Flowrate	Average
L 1	10:05	0.273	16:00	0.264	22:00	0.168	4:00	0.133	0.21
L 2	12:00	0.126	17:00	0.178	22:50	0.102	4:50	0.078	0.12
L 3	10:05	0.183	16:10	0.372	20:30	0.236	4:45	0.144	0.23
L 4	11:15	0.108	16:40	0.209	23:00	0.096	5:40	0.043	0.11
L 5	12:00	0.090	17:10	0.147	23:30	0.066	6:10	0.065	0.09

TABLE 14-2 Water Temperature and pH Observed on Site

(April 28-29, 1992)

No	Water temperature (°C)				p H			
	A	B	C	D	A	B	C	D
L 1	12.0	13.0	11.0	11.0	8.26	7.95	7.95	8.06
L 2	12.0	14.0	11.0	11.0	8.25	7.95	7.95	8.10
L 3	15.0	14.8	13.3	11.9	4.23	8.21	8.33	9.24
L 4	15.4	15.0	14.1	12.6	8.45	8.25	8.34	8.22
L 5	17.7	17.3	16.0	15.5	7.44	7.36	7.52	7.53

*For timing, refer to Table 14-1

TABLE 14-3 DO of Sewage Inflows

(April 28-29, 1992)

No	Measured DO (mg/l)				Rivised DO (mg/l)			
	noon	evening	night	morning	noon	evening	night	morning
L 1	3.14	3.78	4.25	4.69	2.04	2.46	2.77	3.05
L 2	3.97	3.80	3.86	3.58	2.60	2.49	2.52	2.34
L 3	3.12	3.05	3.80	3.88	2.05	2.00	2.50	2.55
L 4	3.23	3.39	4.21	3.61	2.14	2.25	2.79	2.39
L 5	2.21	2.30	2.19	3.04	1.51	1.57	1.49	2.07

TABLE 14-4 Quality of Sewage Inflows

(April 28-29, 1992)

No	p H	BOD (mg/l)	D-BOD (mg/l)	COD (mg/l)	S S (mg/l)	Coliform cells/100ml
L 1	7.2	153	69	350	227	6.40E+06
L 2	7.3	217	70	461	477	6.30E+06
L 3	7.5	140	37	312	334	2.70E+06
L 4	7.3	165	51	343	213	3.40E+06
L 5	7.5	41	17	84.5	33.5	2.20E+05

TABLE 14-5 Quality of Sewage Inflows

(April 28-29, 1992)

No	As (mg/l)	Cr6+ (mg/l)	Cr (mg/l)	Fe (mg/l)	Mn (mg/l)	Pb (mg/l)	Cd (mg/l)	Hg (mg/l)	Cu (mg/l)	Sn (mg/l)	Zn (mg/l)
L 1	<0.005	<0.02	<0.04	3 *B	0.2	<0.08	<0.01	0.0004	<0.04	< 1	0.24
L 2	<0.005	<0.02	<0.04	13.8 *D	0.38	<0.08	<0.01	0.0006	<0.04	< 1	0.32
L 3	<0.005	<0.02	0.07	21.4 *D	1.45 *A	0.25 *C	<0.01	0.0008	0.04	< 1	0.69
L 4	<0.005	<0.02	<0.04	3.4 *B	0.23	<0.08	<0.01	0.0012 *	<0.04	< 1	0.51
L 5	<0.005	<0.02	<0.04	0.41	<0.04	<0.08	<0.01	0.0004	<0.04	< 1	<0.04

Note : * Exceeds the enviromental Standards for Special Class

*A Exceeds the environmental Standards for Class A

*B Exceeds the environmental Standards for Class B

*C Exceeds the environmental Standards for Class C

*D Exceeds the environmental Standards for Class D

TABLE 15-1 Results of River Sediment Quality Analysis(General)
(April 29 / April 22, 1992)

	No	Color	Odor	BOD (mg/g)	COD (mg/g)	I·L (%)	Water (%)	Coliform (cells/100ml)
River sediment	R 1	Gray black	Faint smell of sewage	2,150	9,270	5.2	22.1	-
	R 3	Yellowish brown	Smell of sewage	3,950	20,000	3.8	32.2	-
	R 4	Gray black	Faint smell of sewage	1,840	4,680	2.5	15.3	-
	R 9	Gray black	Smell of sewage	1,720	7,000	2.3	18.4	-
	R14	Dark brown	Faint smell of sewage	2,950	9,590	3.2	27.4	-
Farmland :	I 1						25.7	6.4E+05

Note : The farmland soil was sampled in Mecapaca on April 22, 1992.

TABLE 15-2 Results of River Sediment Quality Analysis (Heavy Metals)
(April 29 / april 22, 1992)

Sample	No	As (mg/kg)	Cr6+ (mg/kg)	Cr (mg/kg)	Fe (mg/kg)	Mn (mg/kg)	Pb (mg/kg)	Cd (mg/kg)	Hg (mg/kg)	Cu (mg/kg)	Sn (mg/kg)	Zn (mg/kg)
River	R1	3.7	<0.06	7.8	17,200	331	15.6	0.6	0.036	31.7	76	207
sediment	R3	5.1	<0.06	26.0	12,700	661	28.4	4.2	0.100	45.7	62	1,540
	R4	25.1	<0.06	7.2	18,500	218	22.9	1.3	15.900	41.8	50	422
	R9	8.3	<0.06	5.3	15,800	182	21.5	0.7	0.054	18.0	43	195
	R14	2.8	<0.06	6.9	16,900	238	26.5	0.6	0.231	22.0	51	159
Farmland soil	I1	5.2	<0.06	8.8	19,300	332	18.8	1.7	0.107	20.4	47	314

Note :The farmland soil was sampled in Mecapaca on April 22, 1992.

TABLE 16-1 Observed Water Quality and Flowrates on Site

Sample	Date	No	Location	Flowrate (m3/s)	Temperature (°C)	p H	DO (mg/l) Observed	DO (mg/l) Revised
Well water	Apr. 8	G 6	Pucho Kollo	-	13.6	8.20	4.46	2.8
	Apr.29	G 7	Mecapaca	-	17.0	-	-	0.5 *
Spring water	Apr. 8	G 1	Llojeta	0.1	17.5	7.80	3.50	2.3
	Apr. 8	G 2	V.Carmen	0.2	12.3	8.40	3.55	2.2 5
	Apr. 8	G 3	V.Rosal	0.2	12.6	8.00	5.76	3.7
	Apr. 8	G 4	Miraflores	0.09	13.5	8.90	4.20	2.3
	Apr.29	G 4	Miraflores	-	13.5	-	-	7.1 *
	Apr.29	G 5	Florida	-	17.0	-	-	4.5 *
Mining wastewater	Apr.10	M 1	LA SOLUCION	3.44	11.8	8.10	7.56	4.3
Industrial wastewater	Apr.14	F 1	INDUPEL	9.26	17.5	9.80	5.89	3.8
	Apr.14	F 2	FORNO	-	18.8	9.90	4.33	2.8
	Apr.14	F 3	LA PAPELERA	2.49	13.3	9.30	5.85	3.8
Irrigation water	Apr. 1	I 1	Mecapaca	-	17.0	-	-	
	Apr.22	I 1	Mecapaca	-	15.8	-	-	3.7 *
River water	Apr.29	R17	Mecapaca	-	15.5	-	-	5.3 *

TABLE 16-2 Results of the Water Quality Analysis(General)

Sample	Date	No	Location	pH	BOD (mg/l)	D-BOD (mg/l)	COD (mg/l)	SS (mg/l)	Coliform cells/100ml
Well water	Apr. 8	G 6	Pucho Kollo	-	1	-	1	< 1	0.00E+00
	Apr.29	G 7	Mecapaca	7.8	<1	-	< 1	2	2.00E+02
Spring water	Apr. 8	G 1	Llojeta	-	<1	-	< 1	< 1	0.00E+00
	Apr. 8	G 2	V.Carmen	-	1.2	-	18	< 1	0.00E+00
	Apr. 8	G 3	V.Rosal	-	1.1	-	21	< 1	0.00E+00
	Apr. 8	G 4	Miraflores	-	<1	-	1	5	8.00E+02
	Apr.29	G 4	Miraflores	8.1	<1	-	< 1	< 1	2.00E+02
	Apr.29	G 5	Florida	7.6	<1	-	< 1	< 1	0.00E+00
Mining wastewater	Apr.10	M 1	LA SOLUCION	-	1.6	-	39	438	0.00E+00
Industrial wastewater	Apr.14	F 1	INDUPEL	-	129	-	701*	996	7.50E+04
	Apr.14	F 2	FORNO	-	305*	-	825*	452	1.03E+07
	Apr.14	F 3	LA PAPELERA	-	233	-	680*	1,970	2.60E+06
Irrigation water	Apr. 1	I 1	Mecapaca	7.6	18.5	1.4	52.6	728	8.60E+05
	Apr.22	I 1	Mecapaca	7.8	22	1.8	79.4	1,070	2.20E+06
River water	Apr.29	R17	Mecapaca	7.8	16	-	69.2	2,010	1.70E+06

Note :* Exceeds the allowable limits of effluent standards.

TABLE 16-3 Results of the Water Quality Analysis (Heavy metals)

Sample	Date	No	Location	As (mg/l)	Cr6+ (mg/l)	Cr (mg/l)	Fe (mg/l)	Mn (mg/l)	Pb (mg/l)	Cd (mg/l)	Hg (mg/l)	Cu (mg/l)	Sn (mg/l)	Zn (mg/l)
Well water	Apr. 8	G 6	Pucho Kollo	<0.005	<0.02	<0.04	0.12	<0.04	<0.08	<0.01	<0.0002	<0.04	< 1	<0.04
	Apr.29	G 7	Mecapaca	<0.005	<0.02	<0.04	0.42 *	1.02 *A	<0.08	<0.01	<0.0002	<0.04	< 1	<0.04
Spring water	Apr. 8	G 1	Llojeta	0.007	<0.02	<0.04	0.04	<0.04	<0.08	<0.01	<0.0002	<0.04	< 1	<0.04
	Apr. 8	G 2	V.Carmen	<0.005	<0.02	<0.04	0.16	<0.04	<0.08	<0.01	<0.0002	<0.04	< 1	0.06
	Apr. 8	G 3	V.Rosal	<0.005	<0.02	<0.04	<0.04	<0.04	<0.08	<0.01	<0.0002	<0.04	< 1	0.18
	Apr. 8	G 4	Miraflores	<0.005	<0.02	<0.04	0.3	<0.04	<0.08	<0.01	<0.0002	<0.04	< 1	<0.04
	Apr.29	G 4	Miraflores	<0.005	<0.02	<0.04	0.08	<0.04	<0.08	<0.01	<0.0002	<0.04	< 1	<0.04
	Apr.29	G 5	Florida	<0.005	<0.02	<0.04	<0.04	<0.04	<0.08	<0.01	<0.0002	<0.04	< 1	<0.04
Mining wastewater	Apr.10	M 1	LA SOLUCION	0.009	<0.02	<0.04	59.1* D	12.4 *D	2.10 *D	0.24 *B	0.0009	0.61	< 1	23.2 *C
Industrial	Apr.14	F 1	INDUPEL	<0.005	<0.02	0.05	1.8	0.19	<0.08	<0.01	0.0014	0.06	< 1	0.9
wastewater	Apr.14	F 2	FORNO	<0.005	<0.02	<0.04	15.7* *	0.73	0.23	<0.01	0.0007	0.07	< 1	0.76
	Apr.14	F 3	LA PAPELERA	<0.005	<0.02	<0.04	2.9	0.31	<0.08	<0.01	0.0002	0.07	< 1	1.28
Irrigation	Apr. 1	I 1	Mecapaca	0.007	<0.02	<0.04	19.9* D	0.4	<0.08	<0.01	<0.0002	<0.04	< 1	0.4
water	Apr.22	I 1	Mecapaca	0.007	<0.02	0.04	31.7* D	0.96 *	<0.08	<0.01	0.0006	0.05	< 1	0.98
River water	Apr.29	R17	Mecapaca	0.007	<0.02	0.04	59.1* D	1.11 *A	<0.08	<0.01	0.0003	0.05	< 1	0.47

Note : * Exceeds the environmental Standards for Special Class
*A Exceeds the environmental Standards for Special Class A
*B Exceeds the environmental Standards for Special Class B
*C Exceeds the environmental Standards for Special Class C
*D Exceeds the environmental Standards for Special Class D

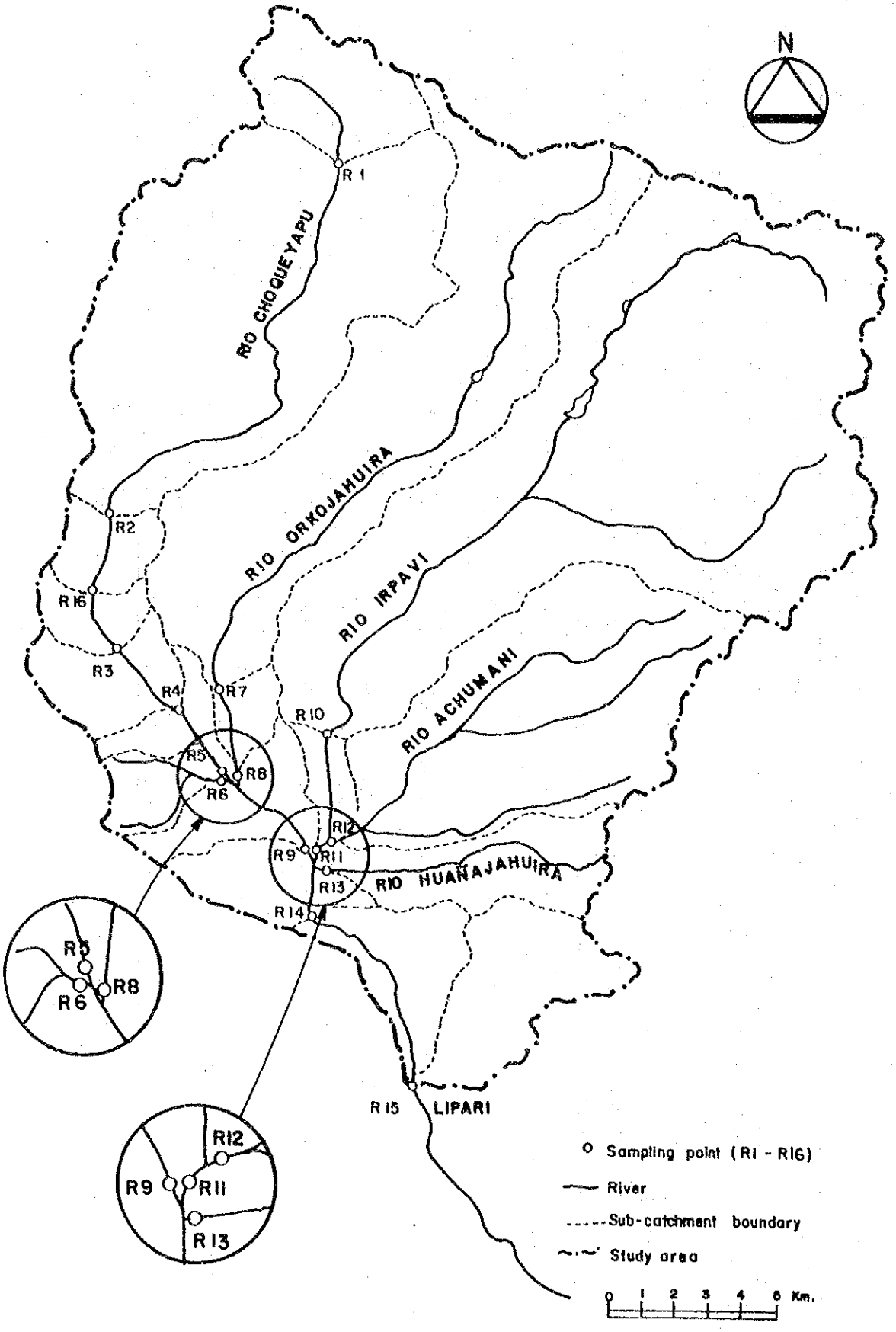


Figure 1 Sampling Points for River Water Quality Survey

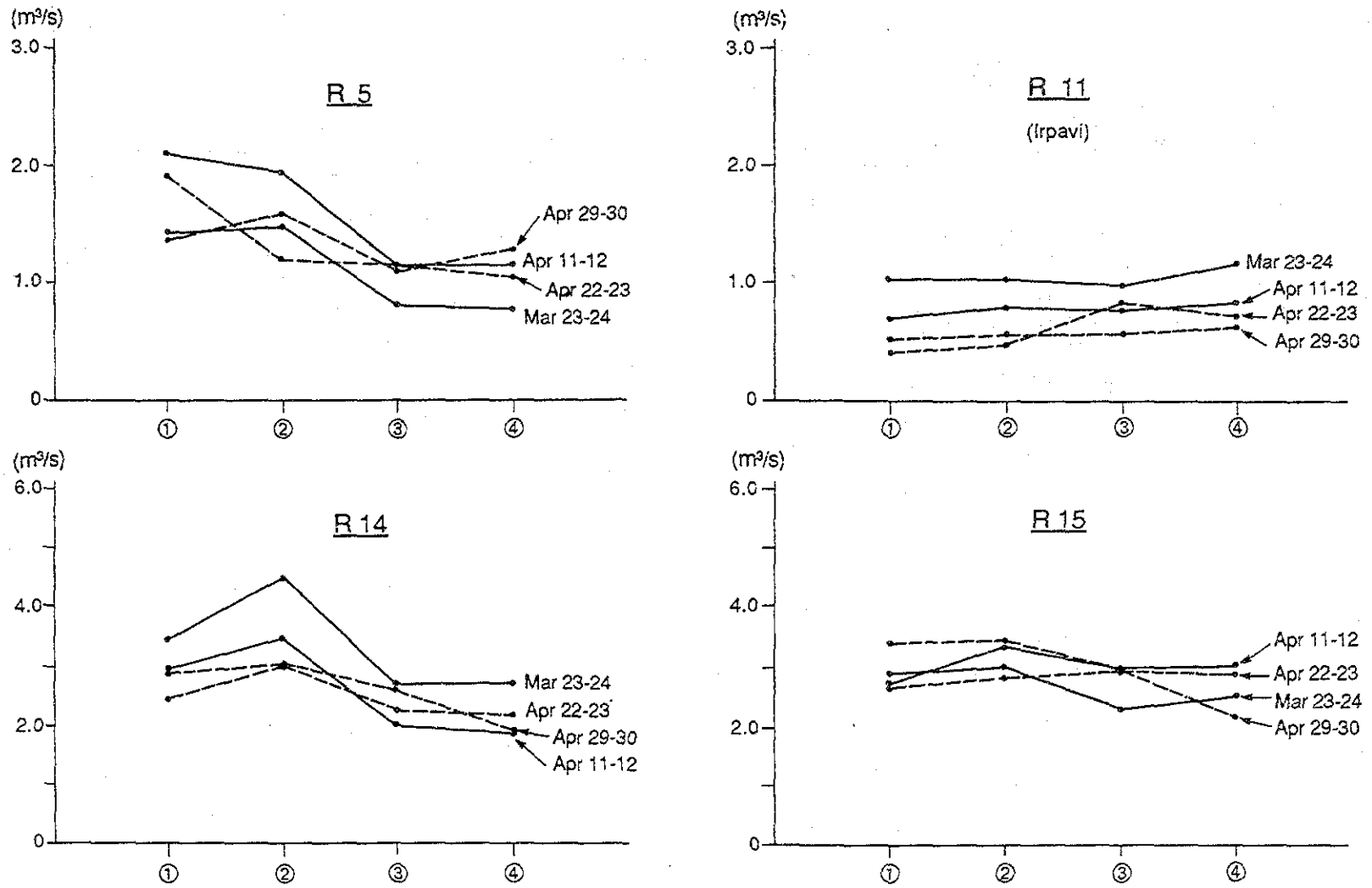


Figure 2 Daily Fluctuation of the River Flowrates

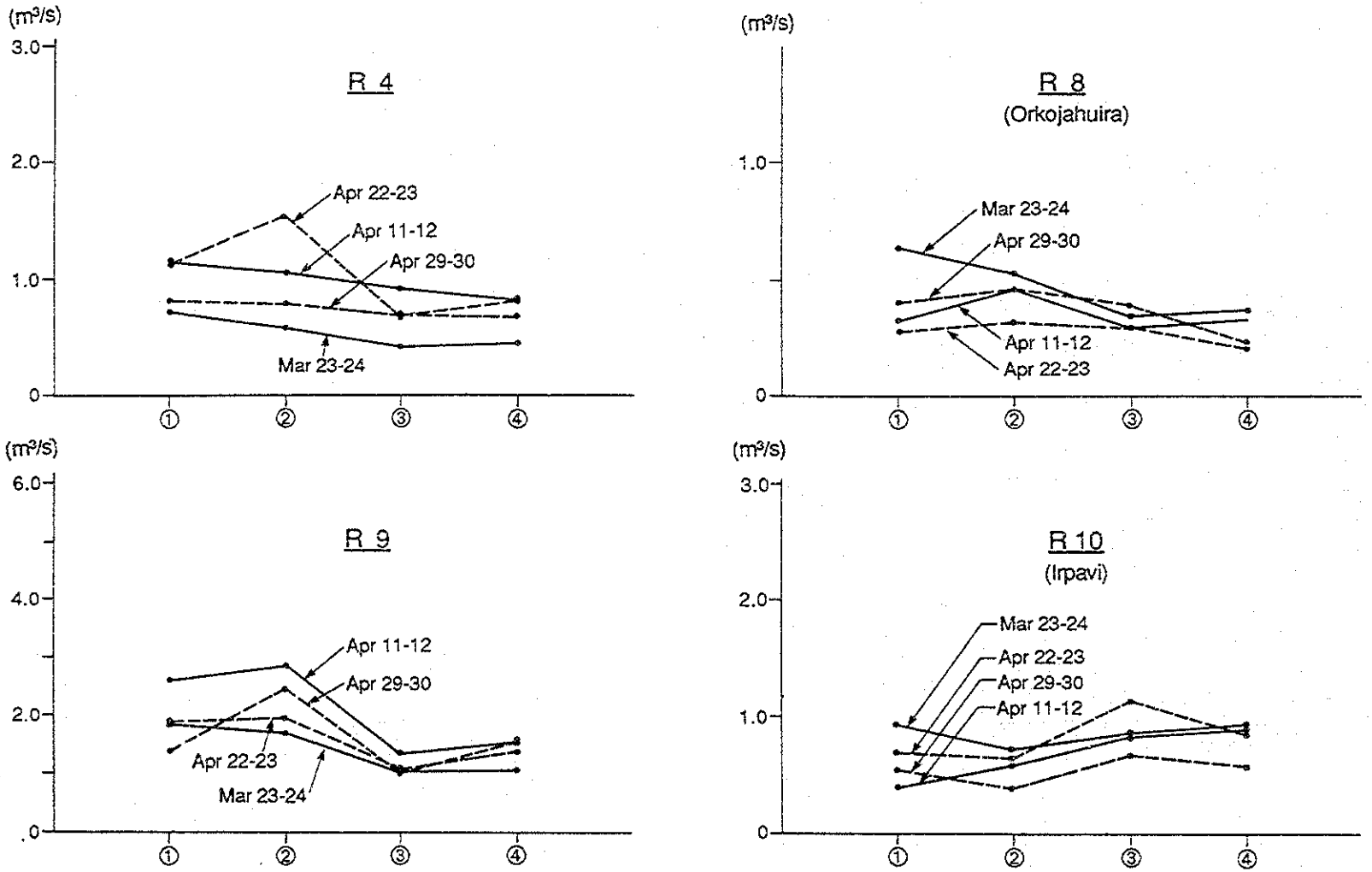


Figure 2 Daily Fluctuation of the River Flowrates (continued)

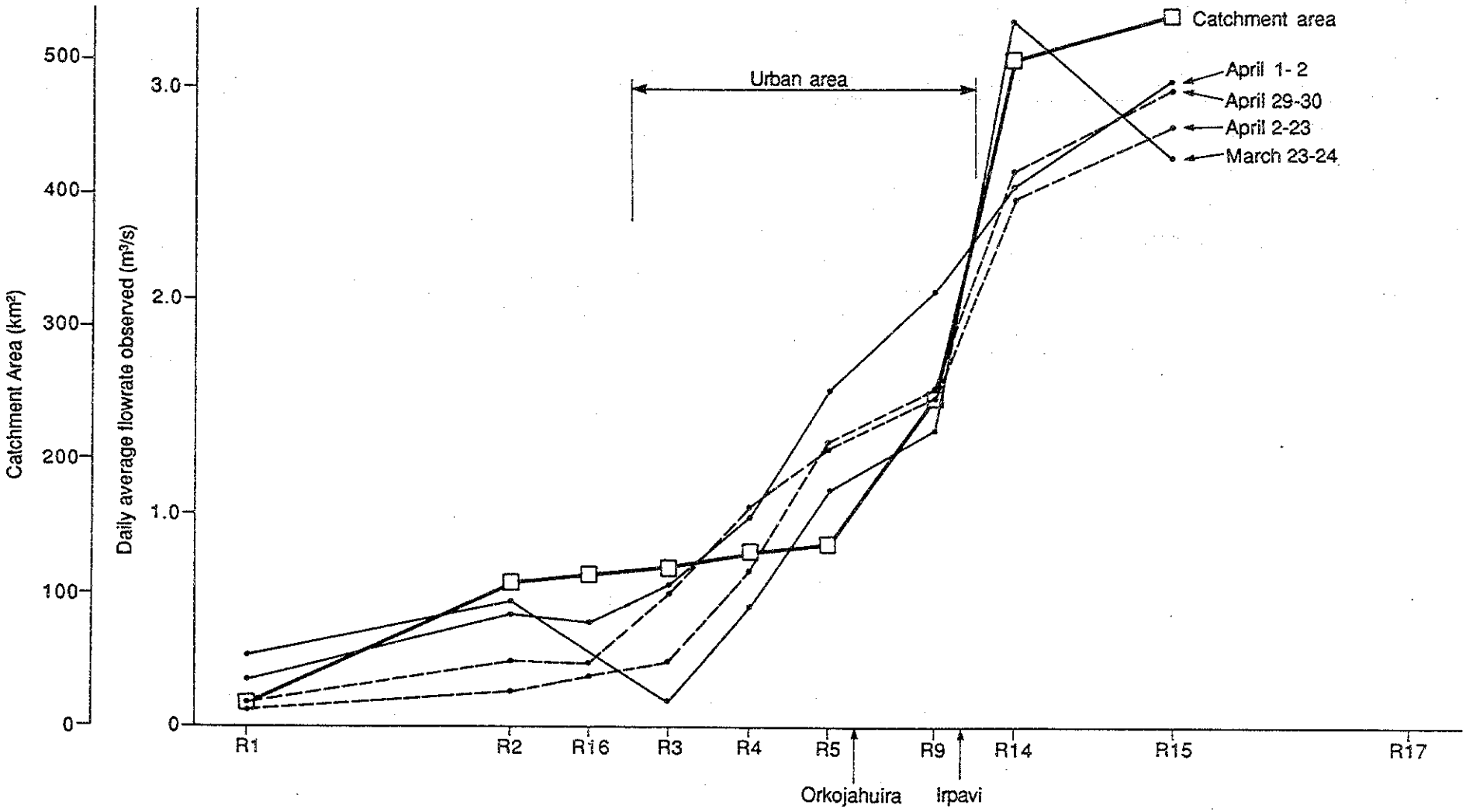


Figure 3 Average Flowrate and Catchment Area of Each Sampling Point

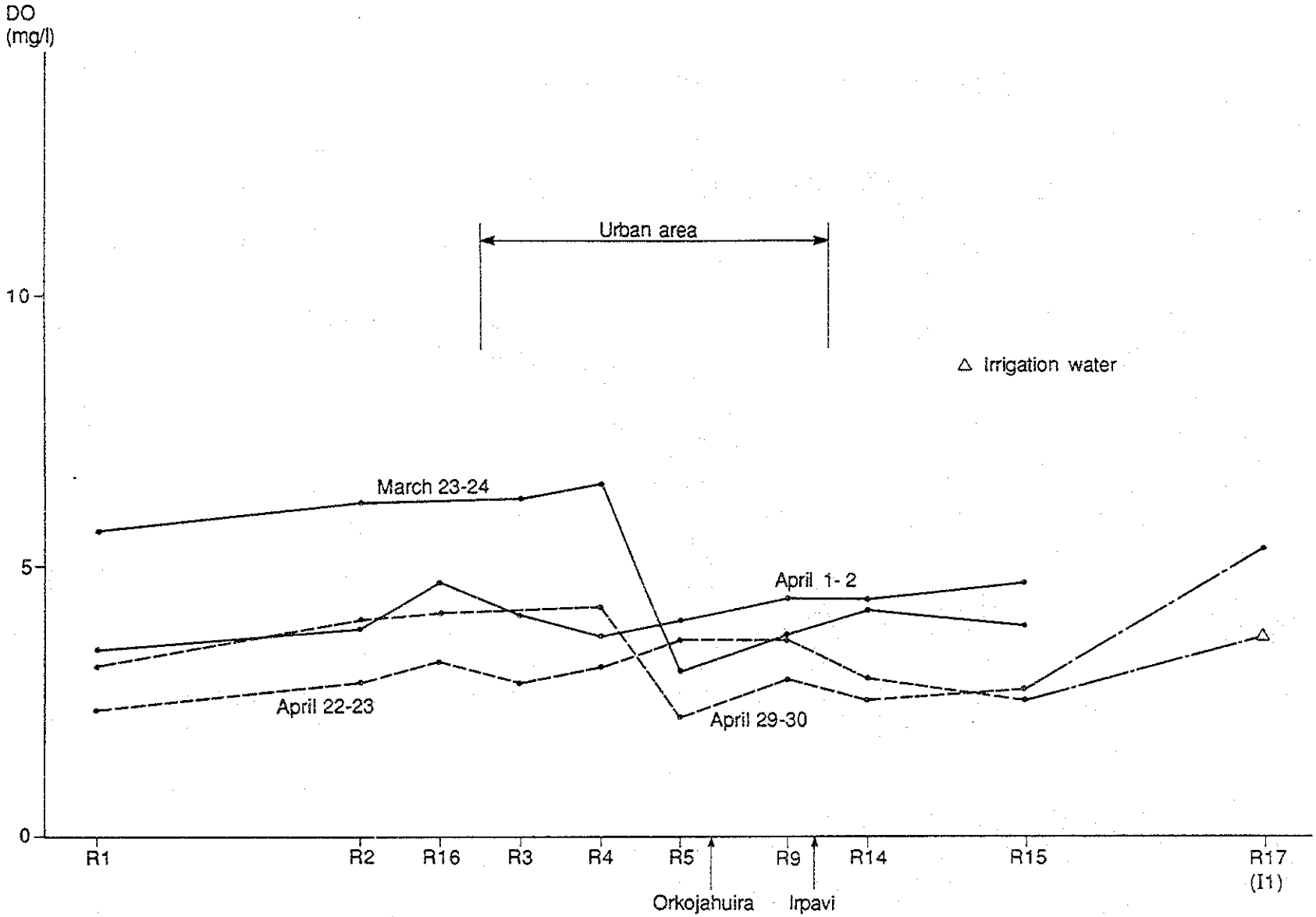


Figure 4 Changes of Daytime DO along the Choqueyapu River

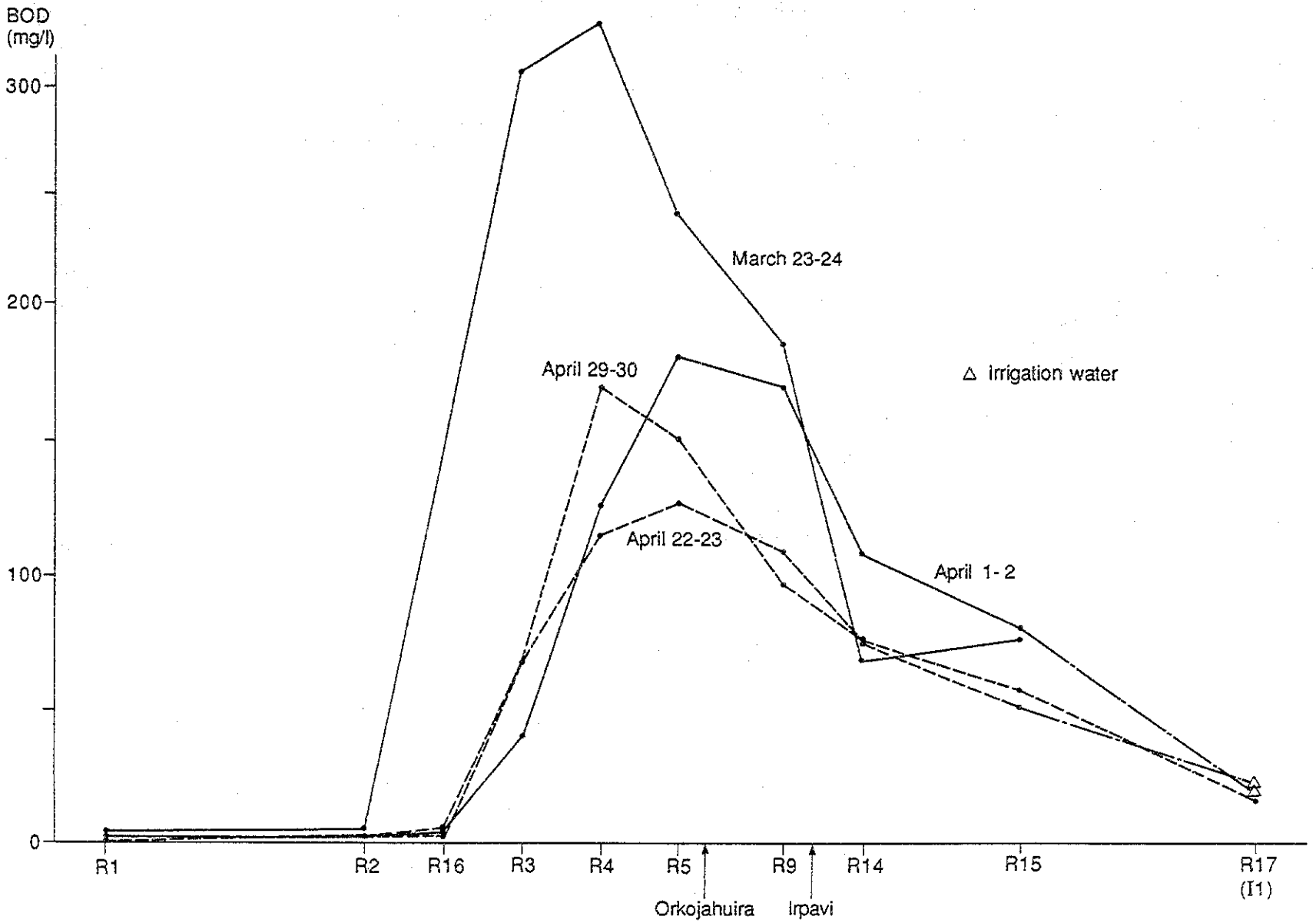


Figure 5 Changes of Daytime BOD along the Choqueyapu River

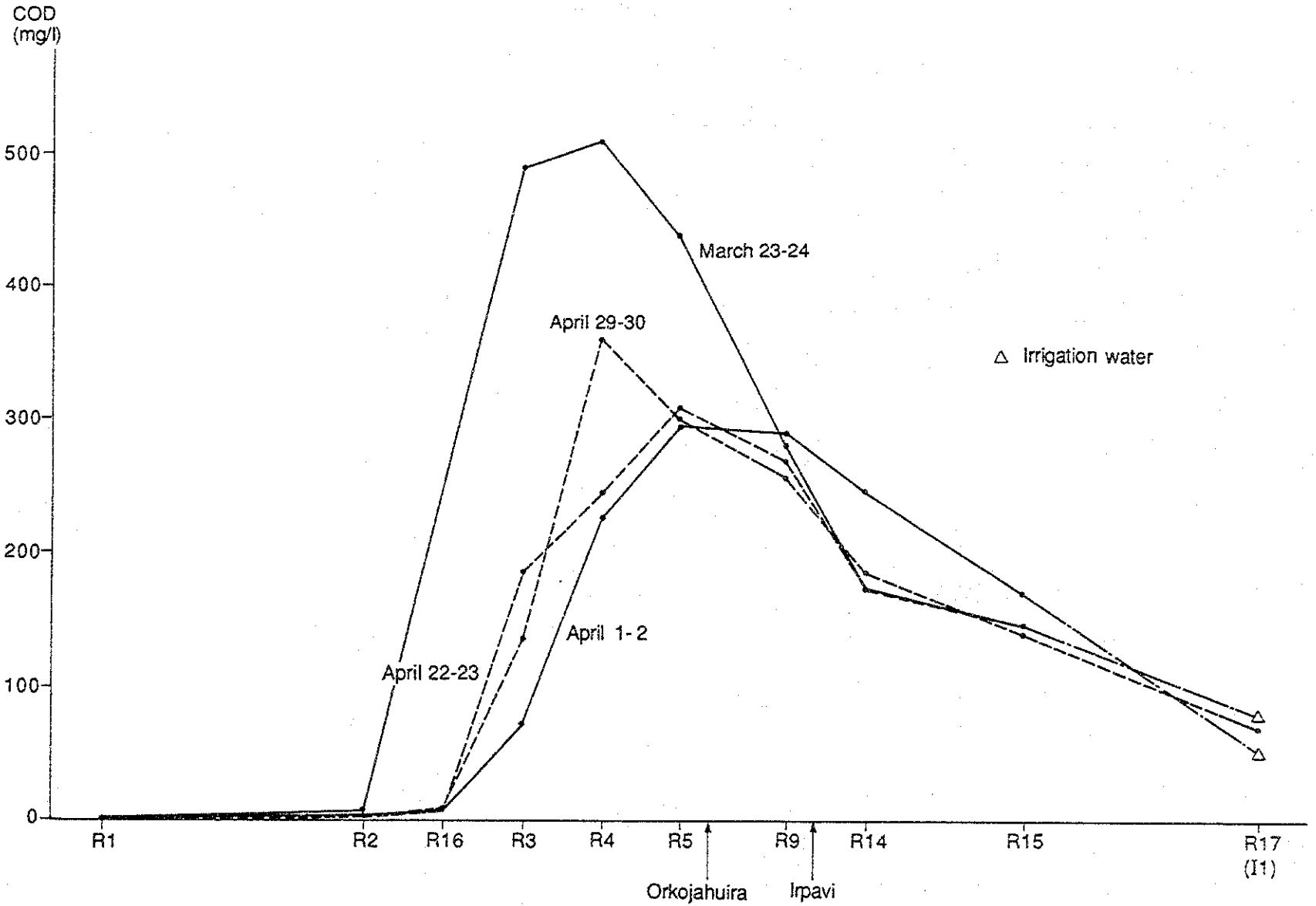


Figure 6 Changes of Daytime COD along the Choqueyapu River

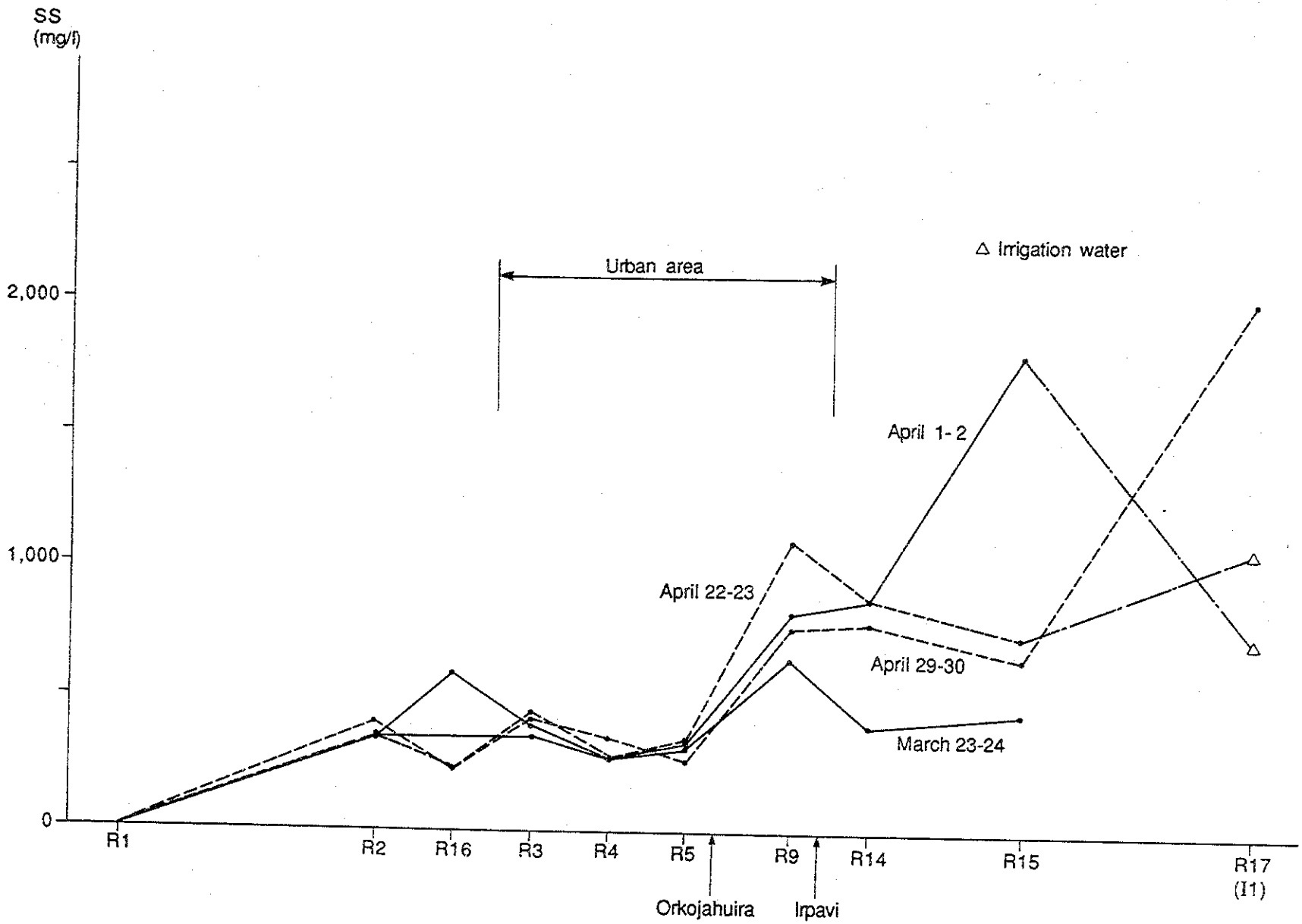


Figure 7 Changes of Daytime SS along the Choqueyapu River

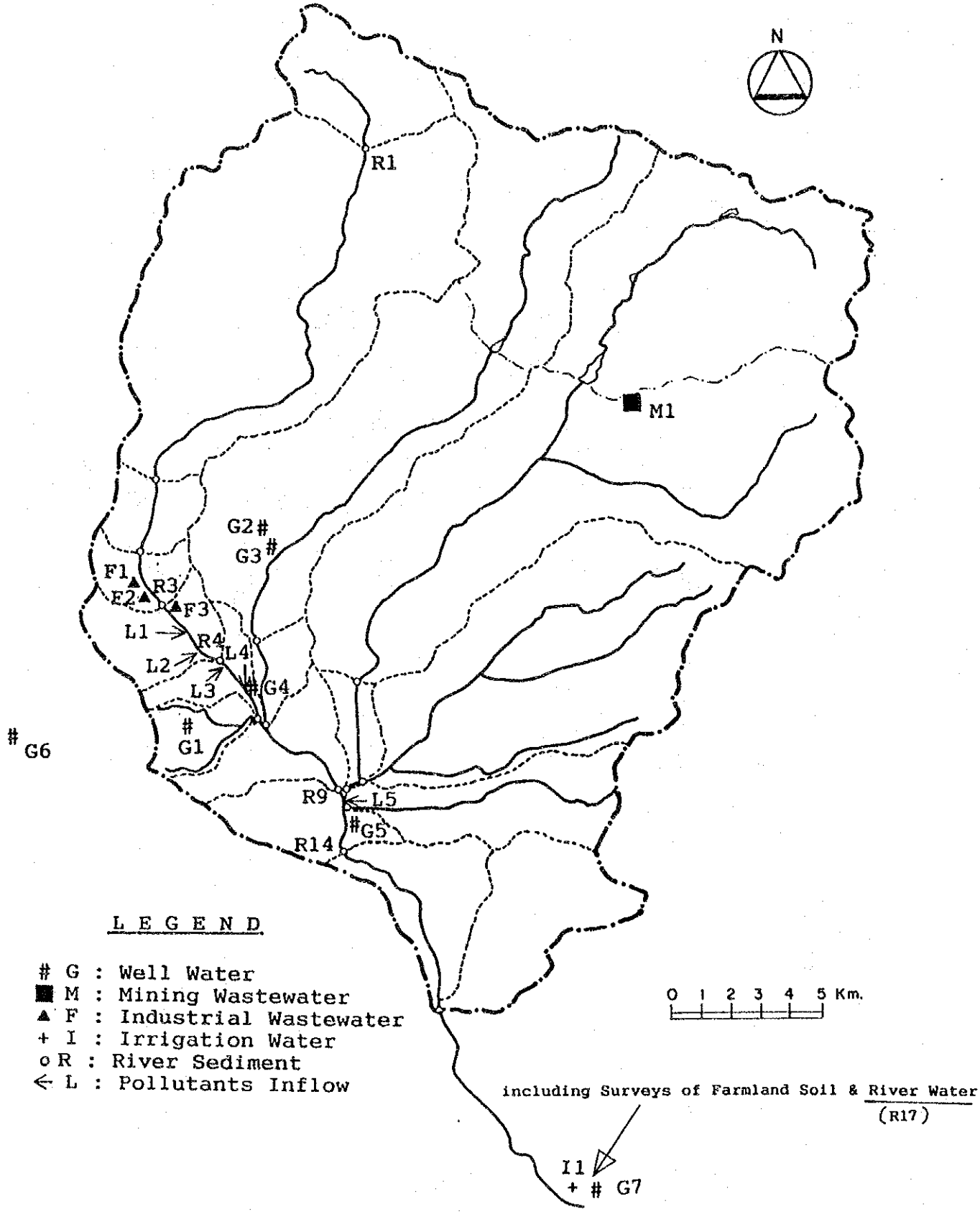


Figure 8 Sampling Points for Surveys other than River Water Quality Survey

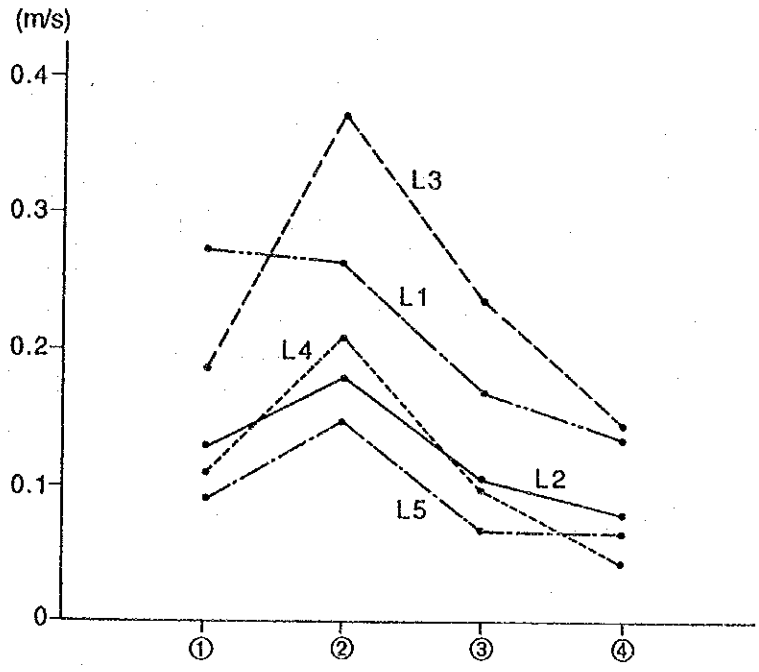


Figure 9 Daily Fluctuation of Sewage Flowrates

2. SUMPLE SURVEY ON PUBLIC CONSCIOUSNESS TOWARD RIVER WATER POLLUTION

A sample questionnaire survey was carried out to throw light on people's consciousness toward river water pollution such as the water color/smell, the contraction of diseases, the expectation of water quality improvement and the conditions of water supply services in the objective zones of Central and Southern. A subject of the survey was classified into five categories: (1) general residents in ordinary houses; (2) owners and residents in high-rised apartment houses; (3) entrepreneurs of major manufacturing establishments; (4) managers of major hotels; and (5) foreign tourists to La Paz City. However, most entrepreneurs of manufacturing establishments hardly cooperated in getting the questionnaire survey, because of the ticklish situation for the legislation of the environmental conservation law. The respective questionnaire forms were attached at the end of this Annex A. Surveyors visited houses or facilities with questionnaire forms and asked questions to householders, entrepreneurs or equivalents. The survey was conducted from the beginning of April through the end of May, 1992.

1 GENERAL RESIDENTS

1.1 Distribution of Respondents

The survey got effective answers from 974 respondents in two targets zones. The distribution of the respondents was listed in Table 2.6.1(1). The INE zone numbers in the table were demarcated by INE for the census survey. The income levels by the zone were not official but classified by a generally accepted idea of the people in La Paz. The distribution by zone of income level as follows: 1) 189 in high income zones; 2) 511 in middle income zones; and 3) 274 in low income zones.

1.2 Consciousness and Utilization of River Water

955 or 98% of respondents were aware that purification of river water around their houses is important, as shown in Table 2.6.1(2). This figure proves that the rivers in the city are contaminated and give an unfavourable impression to citizens. Whereas, the people are aware that the rivers are to function as sewerage for the city, because 62% of the respondents answered that the rivers are used for sewerage. Besides, 15% of the respondents answered that the rivers are used for dumping garbage, as well. Thus, the rivers have been contaminated gradually in proportion as the residents increase in the city.

Although a quarter of respondents think that there are no problems on river conditions, other people are conscious of the following problems: 1) 59% of the respondents is aware of obnoxious odour from the rivers; 2) 42%, eye-sore in riparian conditions; and 3) 25%, breeding ground of mosquitoes and germs. Since most of respondents are living in town proper, they scarcely make use of river water for agricultural production except only nine respondents.

1.3 Water Sources and Consumption

Regarding water sources for daily life such as drinking, cooking, washing and cleaning, nearly 90% of the people rely on SAMAPA's water supply system. Nearly 7% is getting water for the daily life from public taps, as shown in Table 2.6.1(3). Nearly 2% is still not to rely on the piped supply system and get water from wells or springs.

According to the respondents, every household consumed water about 39 m^3 per month on average, as shown in Table 2.6.1(4). Its monthly charge amounted at Bs.26 on average. Thus, its average unit rate of water worked out around Bs.0.67 per m^3 (equivalent to about US$0.18 or J¥24 per m^3).

1.4 Contraction of Diseases

Table 2.6.1(5) shows the number of patients who suffered from water-borne diseases during the recent five years. Among the diseases, the people were the most susceptible to diarrhoeal diseases according to the table. Succeeding to 1) diarrhoeal diseases, the following water-borne diseases were epidemic in the city in order of the number of patients: 2) skin sepsis and ulcers; 3) dysentery; 4) typhoid; 5) infective hepatitis; 6) amebiasis; 7) paratyphoid; and 8) cholera.

In the table, the people spent Bs.7,389 in total for medical care during the same period. Since the number of patient was 141 in total, it amounted at Bs.52 per patient on average.

Tables 2.6.1(5a) to 2.6.1(5c) show the distribution of patients by INE block. Besides the contraction of diseases, the tables show the distribution of both the total number of households' members and the people's consciousness on river conditions by INE block. Applying these data to regression analysis, the JICA study team tried to find out the relationship between the disease contraction rate and the people's consciousness on river conditions as follows:

1) Applied data

y : Number of those who contracted water-borne diseases in the last five years (patients/1000 population: in this case, population was derived from five times of the total number of households members)

x_1 : Average percentage of respondents who replied that water of rivers was giving off obnoxious odour (%)

x_2 : Average percentage of respondents who replied that rivers were eye-sore (%)

x_3 : Average percentage of respondents who replied that rivers were a breeding ground of mosquitoes and germs (%)

2) Results of multiple regression analysis

Regression equation: $y = 2.329 + 1.450x_1 + 3.875x_2 + 0.095x_3$

Multiple correlation coefficient: 0.155

1.5 River Water Quality

About 60% of the respondents desired that the quality of the river water be clear, as shown in Table 2.6.1(6). Besides, 17% of them desired to deodorize the rivers contaminated. 14% of them desired to get rid of the eye-sore in the river courses.

For improvement of river water quality, 56% of the respondents thought to make the people stop throwing garbage into rivers. 19% of them agreed to establish a public sewage treatment plant, although the people have to bear a fair share of the cost. 10% approved to regulate and to control industrial waste water, although prices of industrial products may increase a little as a results.

1.6 Effects on Price of Land Due to Purification of River

Focussing on socio-economic impacts owing to purification of the rivers, one observes that price of land in the objective areas would be expected to increase by a certain percentage because of improvement of living circumstances. According to Table 2.6.1(7), the respondents expected the price of land to increase by 19% more than the present value on average. Incidentally, the present value of land was estimated at Bs.675 per m^2 on average. It was furthermore broken down as follows: Bs.1,580/m^2 of the present value of land and 25.2% up from the present value in high income blocks; Bs.519/m^2, 12.2% in middle income blocks; and Bs.166/m^2, 23.2% in low income blocks.

1.7 Household Income and Willingness to Pay for Purification of Rivers

Family size of respondents was 5.8 persons on average, of whom 1.7 persons on average were income earners in the family. A total monthly income of household was Bs.662 on average. It

was broken down as follows: in high income blocks, Bs.1,437/month on average; in middle income blocks, Bs.473/month; and in low income blocks, Bs.457.

Likewise, willingness to pay for purification of rivers was Bs.2.50/month on average or 0.38% of the total household income. It was distributed as follows: in high income blocks, Bs.3.64/month on average or 0.25% of income; in middle income blocks, Bs.2.27/month or 0.48%; and in low income blocks, Bs.2.06/month or 0.45%.

The relation between household income and willingness to pay was tabulated in Table 2.6.1(8) and Fig.2.6.1. The regression equation derived from the above data was:

$$y = 1.763 + 0.00112x$$

where,

x : monthly household income

y : willingness to pay for purification of rivers

Incidentally, the correlation coefficient of these two factors was 0.314. Then, the regression estimate of willingness to pay were Bs.2.50, Bs.3.37, Bs.2.29 and Bs.2.27 respectively, when the household incomes were Bs.662 of the entire household incomes, Bs.1,437, Bs.473 and Bs.457 of household incomes of respective income level.

2 RESIDENTS IN APARTMENT

2.1 Distribution of Apartment Buildings and Their Residents

The survey got cooperative responses from 41 owners of apartment buildings and 81 households in their apartments. The distribution of the buildings by INE block was shown in Table 2.6.2(1). The average number of apartments was 52 in a building. The largest building has 126 apartments and the smallest one, 17 apartments. The average family size of the residents was 3.1 persons.

2.2 Water Sources and Consumption

The residents in apartment are getting potable water through SAMAPA's water supply system entirely. Their average water consumption was 31 m3 per month, which was smaller than that of general residents of 39 m3. Their water charge was Bs.25 per month, so the monthly unit charge amounted at Bs.0.81 per m3.

2.3 Consciousness of Rivers

78 or 98% of respondents were conscious of importance of river purification, as shown in Table 2.6.2(2). This percentage was the same as that of the general residents. Their thinking with respect to the role of rivers in the city was almost the same that of the general residents, i.e., 63% of them regarded the rivers as sewerage and 17%, as places for garbage dumping.

The respondents in apartments had less serious impression on river conditions than the general residents. About 40% of respondents think that there are no problems on river conditions. Other people are conscious of the following problems: 1) 47% of the respondents is aware of obnoxious odour from the rivers; 2) 22%, eye-sore in riparian conditions; and 3) only 3%, breeding ground of mosquitoes and germs.

2.4 Contraction of Diseases

Table 2.6.2(4) shows the number of patients who suffered from water-borne diseases during the recent five years. Among the diseases, the people were the most susceptible to diarrhoeal diseases as analyzed in the general residents' section. Succeedingly, the following water-borne diseases were seen in residents in apartments in order of the number of patients: typhoid, amebiasis, infective hepatitis, paratyphoid, skin sepsis and ulcers, shigelosis, dysentery and nocardiosis.

In the table, the people spent Bs.9,860 in total for medical care during the same period. Since the number of patient was 33 in total, it amounted at Bs.299 per patient on average.

Tables 2.6.2(4a) shows the distribution of patients by INE block. Besides the contraction of diseases, the table shows the distribution of both the total number of households' members and the people's consciousness on river conditions by INE block. Applying these data and general residents' data in Tables 2.6.1(5a) to 2.6.1(5c) to regression analysis, the JICA study team tried to find out the relationship between the disease contraction rate and the people's consciousness on river conditions. As a result, the total degrees of freedom increases from 118 analyzed in section2.6.1(4) to 127. The regression equation was as follows:

Regression equation: $y = 2.204 + 1.403x_1 + 4.041x_2 + 0.196x_3$

Multiple correlation coefficient: 0.167

2.5 River Water Quality

64% of the respondents desired that the quality of the river water be clear, as shown in Table 2.6.2(5). 12% of them desired to deodorize the rivers contaminated. Among the desired river

water quality for the people, the obnoxious odour of the rivers occupied the attention of the residents in the apartments, as well as the general residents.

For improvement of river water quality, a half of them agreed to establish a public sewage treatment plant, although they have to bear a fair share of the cost. More than a quarter of them approved to regulate and to control industrial waste water, although prices of industrial products may increase a little as a results. 18% of the them thought to make the people stop throwing garbage into rivers. This order was different from the general residents.

2.6 Effects on Price of Land due to Purification of River

According to Table 2.6.2(6), the respondents had an interest in the price of land to increase by 26% more than the present value on average. The increase rate was much higher than that of the general residents of 19%. The present value of land was estimated at Bs.702 per m^2 on average.

2.7 Household Income and Willingness to Pay for Purification of Rivers

Family size of respondents was 3.3 persons on average, of whom 1.6 persons on average were income earners in the family. This size was much smaller than that of the general residents, i.e., 5.8 of family size and 1.7 of income earner. A total monthly income of household was Bs.1,923 on average. It was almost three times of the general residents (Bs.662/month).

Likewise, willingness to pay for purification of rivers was Bs.6.05/month on average or 0.32% of the total household income. This value was also 2.4 times of the general residents, although the percentage was somewhat smaller than that of the general residents of 0.38%.

The relation between household income and willingness to pay was tabulated in Table 2.6.2(7). The regression equation derived from these data was:

$$y = 3.168 + 0.00150x$$

where,

x : monthly household income

y : willingness to pay for purification of rivers

Incidentally, the correlation coefficient of these two factors was 0.573.

In the case that the general residents' data were combined into the apartment residents' data, the statistical and regression analysis became as follows:

1) Effective respondents: 976

2) Monthly households income (x):

Average: Bs.763

Standard deviation: Bs.1,053

3) Willingness to pay for purification of rivers (y):

Average: Bs.2.79

Standard deviation: Bs.3.50

4) Correlation coefficient: 0.414

5) Regression equation: $y = 1.740 + 0.00137x$

3 HOTEL

Eleven hotels in Central Zone responded to this survey. Their location and outlines of facilities were shown in Table 2.6.3(1). The largest one has 345 guest rooms with 688 beds and the smallest one has only 17 rooms with 31 beds. Table 2.6.3(2) shows major service facilities which the hotels install in their buildings.

The number of guests at respective hotels were enumerated in Table 2.6.3(3). The table shows the monthly numbers in the year 1991 and the annual numbers during 1987 to 1991. although the number of guests for the recent five years did not fluctuate sharply as shown in the table, in 1991 the number seemed to dwindle as compared with the previous years.

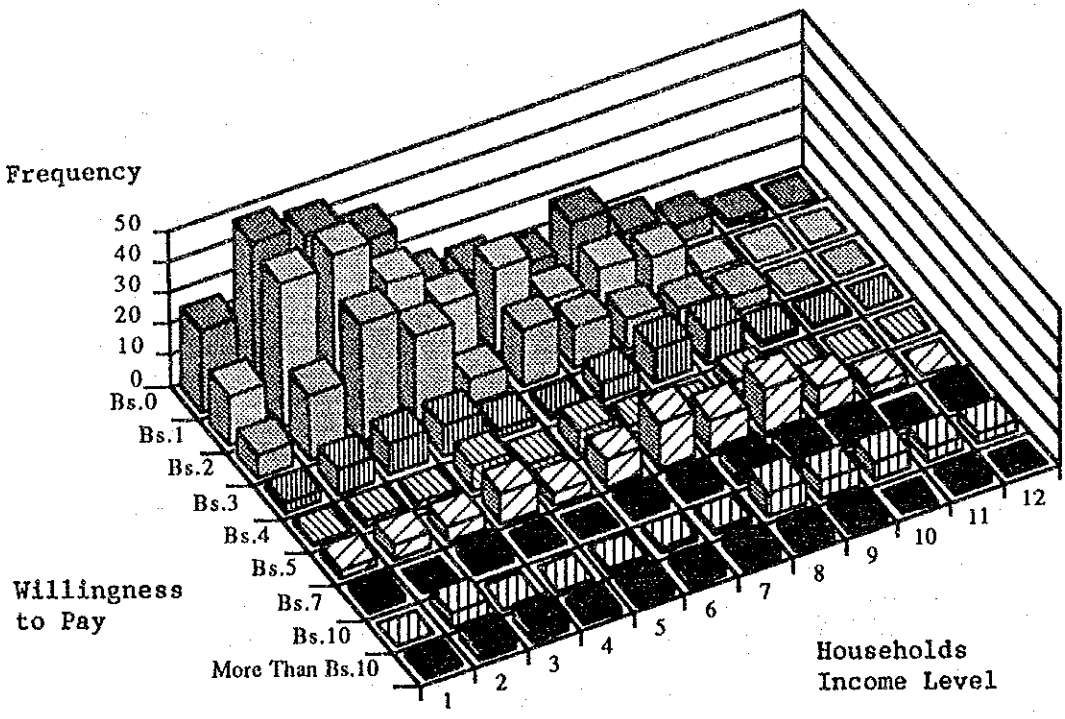
4 TOURISTS

99 foreign tourists into the city responded to this survey. Their nationality was counted up to 28 nations seen in Table 2.6.4(1). 65 or 66% of them was male and 69 or 70% was single. Regarding their purpose of visit, 67 or 68% of them stayed there on holiday tours. 21 or 21% was on business.

Average times of visit to La Paz were 1.6 for the last five years. Among them, Peruvian and Brazilian visited there the most frequently, i.e., 4.0 times and 3.0 times, respectively. They also expected to visit La Paz the most frequently in the coming five years, as shown in Table 2.6.4(2).

65 or 66% of them noticed that the water of rivers in La Paz is mostly filthy, dark-coloured and stinking. However, this contamination of the rivers did not seem to spoil the visitors' pleasure on La Paz seriously. Because, their interest in visiting to La Paz almost kept the same level,

even after the rivers would be purified in the future. An average times of visits were 2.4 under the present conditions as shown in the table, and those were almost the same of 2.7 even after river purification.



Legend

1. Less than Bs.100	5. Bs.401 to Bs.500	9. Bs.1001 to Bs.2000
2. Bs.101 to Bs.200	6. Bs.501 to Bs.600	10. Bs.2001 to Bs.4000
3. Bs.201 to Bs.300	7. Bs.601 to Bs.700	11. Bs.4001 to Bs.6000
4. Bs.301 to Bs.400	8. Bs.701 to Bs.1000	12. Over Bs.6000

Bs.0 Bs.1 Bs.2 Bs.3 Bs.4 Bs.5 Bs.7 Bs.10 More Than Bs.10

Fig. 2.6.1 Frequency of Willingness to Pay by Households Income Level

Table 2.6.1(1) Distribution of Respondents as General Residents by INE Block

INE Number	Income Level	No. of Respondents	INE Number	Income Level	No. of Respondents	INE Number	Income Level	No. of Respondents	INE Number	Income Level	No. of Respondents
151	L	2	321	H	10	510	L	3	780	M	7
152	L	3	330	H	10	520	L	1	781	M	3
161	L	5	340	M	11	521	L	3	790	L	3
170	L	5	341	M	10	530	L	4	791	L	3
171	M	3	350	M	7	531	L	2	792	L	3
180	M	18	351	M	9	541	L	6	793	L	2
190	M	9	360	L	11	560	L	4	800	L	3
200	M	22	361	L	12	570	L	5	810	M	3
210	M	20	362	L	9	571	L	7	811	M	2
211	M	10	370	M	7	580	L	6	812	M	7
220	L	10	380	M	8	581	L	4	820	M	6
231	M	21	381	M	8	590	M	9	830	H	5
240	L	19	390	M	8	591	M	6	831	H	6
250	L	11	391	M	7	600	M	5	840	H	4
251	L	12	400	M	7	610	M	13	841	H	1
260	L	5	401	M	7	620	M	15	860	H	16
261	L	7	410	M	7	630	M	6	861	H	20
262	L	13	411	M	7	631	M	10	862	H	8
263	L	5	412	M	8	640	M	5	863	H	14
270	M	9	420	L	9	650	M	5	871	M	10
271	M	11	421	L	6	660	M	8	873	M	10
272	M	10	430	L	9	670	L	2	880	H	10
280	M	9	440	L	7	690	L	3	882	H	10
281	M	5	450	L	7	711	L	10	890	H	15
290	M	10	451	L	5	730	M	2	891	H	15
291	M	10	460	M	9	740	M	5	900	H	10
300	M	5	470	M	7	741	M	5	901	H	10
301	M	10	480	M	23	750	M	5	903	H	10
310	M	15	490	L	15	760	M	5	905	H	15
311	M	12	500	L	10	770	M	3			

Number of Respondents in "L" blocks:	274
Number of Respondents in "M" blocks:	511
Number of Respondents in "H" blocks:	189
Total	974

Note: Income level of "LMH" stands for "Low", "Midium" and "High", respectively.

Table 2.6.1(2) Consciousness and Utilization of River

(General Residents)

1. Number of Respondents: 974

2. Impoortance of River Condition

Rate of people who think purification of a river near their home is important

	Number	Rate
a) Yes:	955	98.0%
b) No:	19	2.0%

3. Existing Use of the River

3.1 Use of the River (Plural answers)

	Number	Rate
a) Washing	73	7.5%
b) Irrigation and agricultural use	9	0.9%
c) Recreation use	15	1.5%
d) Sewerage	605	62.1%
e) Garbage dumping	146	15.0%
f) No answer	25	2.6%
g) Others	136	14.0%

3.2 Conditions of the river around respondents (Plural answers)

	Number	Rate
a) No problems	236	24.2%
b) Obnoxious odour	574	58.9%
c) Eye-sore	411	42.2%
d) Breeding ground of mosquitoes and germs	244	25.1%
e) No answer	16	1.6%
f) Others	29	3.0%

3.3 Utilization of river water for agricultural production

(Questions to answerers who use water for agricultural production, in "Question 2.1")

1) Type of Farming

	Number	Rate
a) Irrigation	9	100.0%
b) Upland	2	22.2%

2) Products

	Before Cholera Incident		After Cholera Incident	
	Number	Rate	Number	Rate
a) Wheat	0	0.0%	0	0.0%
b) Maize	1	11.1%	0	0.0%
c) Pulses	0	0.0%	0	0.0%
d) Millet/Sorghum	0	0.0%	0	0.0%
e) Potatoes	4	44.4%	3	33.3%
f) Vegetables	1	11.1%	4	44.4%
g) Flowers	0	0.0%	1	11.1%

Table 2.6.1(3) Water Sources by Consumption Purposes

(General Residents: 974 In Total)

Purpose	Piped System		Public	Tank In Truck			Well	Spring	River	Sold In Bottle	Others
	SAMAPA	Others	Tap	SAMAPA	HAM	Others					
1. Number of Respondents											
a) Drinking	863	5	72	3	8	2	5	16	0	0	1
b) Cooking	863	5	70	3	8	2	5	17	0	0	1
c) Tableware Washing	847	5	69	3	6	2	5	17	0	0	1
d) Shower/Bathing	722	4	16	0	0	1	2	15	3	0	2
e) Clothes Washing	863	6	63	1	1	1	4	17	6	0	1
f) House Cleaning	842	6	57	1	6	1	4	17	1	0	1
g) Hand/Face Washing	863	6	67	1	6	1	4	17	1	0	1
h) Flush Toilet	583	1	2	0	0	0	0	1	1	0	2
i) Car Washing	134	1	0	0	0	0	0	0	1	0	0
j) Splinkling	59	0	2	0	0	0	0	1	0	0	0
k) Others	13	1	0	0	0	0	0	0	1	0	1
2. Percentage Distribution of Respondents (%)											
a) Drinking	88.6	0.5	7.4	0.3	0.8	0.2	0.5	1.6	0.0	0.0	0.1
b) Cooking	88.6	0.5	7.2	0.3	0.8	0.2	0.5	1.7	0.0	0.0	0.1
c) Tableware Washing	87.0	0.5	7.1	0.3	0.6	0.2	0.5	1.7	0.0	0.0	0.1
d) Shower/Bathing	74.1	0.4	1.6	0.0	0.0	0.1	0.2	1.5	0.3	0.0	0.2
e) Clothes Washing	88.6	0.6	6.5	0.1	0.1	0.1	0.4	1.7	0.6	0.0	0.1
f) House Cleaning	86.4	0.6	5.9	0.1	0.6	0.1	0.4	1.7	0.1	0.0	0.1
g) Hand/Face Washing	88.6	0.6	6.9	0.1	0.6	0.1	0.4	1.7	0.1	0.0	0.1
h) Flush Toilet	59.9	0.1	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2
i) Car Washing	13.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
j) Splinkling	6.1	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
k) Others	1.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1

Table 2.6.1(4) Water Consumption and Payment

(General Residents: 974 in Total)

Water Source	Consumption		Water Charge	
	Average Consumption (cu.m./month)	Number of Records (nos.)	Average Charge (Bs./month)	Number of Records (nos.)
1. Piped System (SAMAPA)	39	641	26	866
2. Piped System (Others)	-	-	4	4
3. Public Tap	6	52	-	-
4. Tank Truck (SAMAPA)	-	-	-	-
5. Tank Truck (HAM)	-	-	-	-
6. Tank Truck (Others)	-	-	-	-
7. Well	-	-	-	-
8. Spring	-	-	-	-
9. River	-	-	-	-
10. Sold in Bottle	-	-	-	-
11. Others	1	1	3	2

Table 2.6.1(5) Contraction of Diseases

Disease	Number of Patients	Medication Period (days)		Cost (Bs.)
		Outside Hospital	In Hospital	
1. Cholera	1	0	1	10
2. Typhoid	11	-	47	1,475
	1	21	-	0
3. Paratyphoid	1	0	0	50
4. Infective Hepatitis	6	-	0	1,150
	1	30	-	0
5. Enteroviruses	0	0	0	0
6. Shigelosis	0	0	0	0
7. Dysentery	5	-	1	930
	8	8	-	70
8. Skin Sepsis and Ulcer	17	-	0	1,175
	14	14	-	15
9. Pseudomonas	0	0	0	0
10. Nocardiosis	0	0	0	0
11. Diarrhoeal Diseases	58	-	6	1,561
	13	48	-	63
12. Amebiasis	4	-	0	890
	1	5	-	0
13. Giardiasis	0	0	0	0
Total	141	126	55	7,389

Table 2.6.1(5c) Water Conditions of Rivers and Diseases Contraction in Survey Areas by INE Block

(Conclusion)

INE No.	Income Level *1	Respondents No. *2	Respondents Total of HHs' Members	River Conditions Odour	River Conditions Eye-sore	River Conditions Ground for Germs	Contraction of Diseases Total	Cholera	Typhoid	Paratyphoid	Infec. Hepatitis	Dysentery	Skin Sepsis & Ulc.	Diarrhoeal Diseases	Amebiasis
660	M	8	40	8	7	6	0	0	0	0	0	0	0	0	0
670	L	2	13	2	2	2	0	0	0	0	0	0	0	0	0
690	L	3	14	3	2	3	0	0	0	0	0	0	0	0	0
711	L	10	48	9	6	6	2	0	0	0	1	0	1	0	0
730	M	2	5	2	2	2	0	0	0	0	0	0	0	0	0
740	M	5	35	2	1	0	0	0	0	0	0	0	0	0	0
741	M	5	37	2	0	0	0	0	0	0	0	0	0	0	0
750	M	5	50	1	0	1	0	0	0	0	0	0	0	0	0
760	M	5	31	4	0	0	0	0	0	0	0	0	0	0	0
770	M	3	16	1	0	0	1	0	0	0	0	0	0	1	0
780	M	7	45	1	1	0	1	0	0	0	0	0	0	1	0
781	M	3	19	0	0	0	1	0	0	0	0	0	0	1	0
790	L	3	21	2	0	0	0	0	0	0	0	0	0	0	0
791	L	3	22	1	0	1	0	0	0	0	0	0	0	0	0
792	L	3	13	1	1	0	0	0	0	0	0	0	0	0	0
793	L	2	14	1	1	0	0	0	0	0	0	0	0	0	0
800	L	3	17	2	0	0	1	0	0	0	0	0	0	1	0
810	M	3	19	3	0	0	0	0	0	0	0	0	0	0	0
811	M	2	11	0	0	0	1	0	0	0	0	0	0	1	0
812	M	7	37	6	4	1	0	0	0	0	0	0	0	0	0
820	M	6	34	4	3	2	2	0	2	0	0	0	0	0	0
830	H	5	22	5	4	2	0	0	0	0	0	0	0	0	0
831	H	6	35	4	4	4	0	0	0	0	0	0	0	0	0
840	H	4	18	2	3	1	0	0	0	0	0	0	0	0	0
841	H	1	6	1	1	0	0	0	0	0	0	0	0	0	0
860	H	16	79	10	15	0	5	0	0	0	2	0	2	1	0
861	H	20	120	18	7	4	0	0	0	0	0	0	0	0	0
862	H	8	47	4	6	5	0	0	0	0	0	0	0	0	0
863	H	14	72	3	8	5	1	0	0	0	0	0	1	0	0
871	M	10	63	3	3	5	0	0	0	0	0	0	0	0	0
873	M	10	39	3	7	8	0	0	0	0	0	0	0	0	0
880	H	10	51	9	7	1	0	0	0	0	0	0	0	0	0
882	H	10	47	6	6	0	0	0	0	0	0	0	0	0	0
890	H	15	119	9	13	0	1	0	0	0	0	0	0	0	1
891	H	15	69	7	4	2	0	0	0	0	0	0	0	0	0
900	H	10	53	10	6	4	0	0	0	0	0	0	0	0	0
901	H	10	57	1	9	9	4	0	1	0	1	0	0	2	0
903	H	10	50	7	3	1	0	0	0	0	0	0	0	0	0
905	H	15	62	9	2	2	3	0	0	0	2	0	0	1	0
Total		972	5,666	573	411	244	141	1	12	1	7	13	31	71	5
Aver. Family Size			5.8												

Note: *1 Income level of "LMH" stands for "Low", "Middle" and "High", respectively.
*2 Two respondents were omitted, because households members were missing.

Table 2.6.1(5b) Water Conditions of Rivers and Diseases Contraction in Survey Areas by INE Block

(Continuation)

INE No.	Income Level *1	Respondents No. *2	Respondents Total of HHs' Members	River Conditions Odour	River Conditions Eye-sore	River Conditions Ground for Germs	Contraction of Diseases Total	Cholera	Typhoid	Paratyphoid	Infec. Hepatitis	Dysentery	Skin Sepsis & Ulc.	Diarrhoeal Diseases	Amebiasis
380	M	8	41	3	4	3	1	0	0	0	0	0	0	1	0
381	M	8	46	4	4	3	0	0	0	0	0	0	0	0	0
390	M	8	42	8	1	0	1	0	0	0	0	0	0	1	0
391	M	7	43	7	2	0	0	0	0	0	0	0	0	0	0
400	M	7	52	6	6	2	0	0	0	0	0	0	0	0	0
401	M	7	39	2	0	0	2	0	0	0	0	0	0	2	0
410	M	7	41	6	3	1	2	0	1	0	0	0	0	1	0
411	M	7	41	1	0	0	0	0	0	0	0	0	0	0	0
412	M	8	61	6	4	0	0	0	0	0	0	0	0	0	0
420	L	9	44	5	8	4	5	0	0	0	0	0	0	5	0
421	L	6	24	0	4	0	0	0	0	0	0	0	0	0	0
430	L	9	40	9	7	7	14	0	0	0	1	0	7	6	0
440	L	7	33	6	6	5	4	0	0	0	0	0	0	4	0
450	L	7	48	6	5	4	6	0	0	0	0	0	0	6	0
451	L	5	26	4	5	1	2	0	0	0	0	0	0	2	0
460	M	9	67	4	0	3	0	0	0	0	0	0	0	0	0
470	M	7	49	4	2	1	0	0	0	0	0	0	0	0	0
480	M	23	173	11	4	3	0	0	0	0	0	0	0	0	0
490	L	15	57	13	2	1	1	0	0	0	0	1	0	0	0
500	L	10	68	8	1	0	15	0	0	0	0	7	8	0	0
510	L	3	21	2	1	3	0	0	0	0	0	0	0	0	0
520	L	1	7	1	0	0	0	0	0	0	0	0	0	0	0
521	L	3	16	1	0	0	0	0	0	0	0	0	0	0	0
530	L	4	21	4	0	3	0	0	0	0	0	0	0	0	0
531	L	2	9	2	1	1	0	0	0	0	0	0	0	0	0
541	L	6	30	5	5	5	3	0	0	0	0	1	0	0	2
560	L	4	22	3	2	4	0	0	0	0	0	0	0	0	0
570	L	5	22	5	5	0	0	0	0	0	0	0	0	0	0
571	L	7	30	4	2	3	1	0	0	0	0	0	0	1	0
580	L	6	30	3	2	2	1	0	0	0	0	1	0	0	0
581	L	4	25	0	0	0	0	0	0	0	0	0	0	0	0
590	M	9	40	4	4	1	0	0	0	0	0	0	0	0	0
591	M	6	28	0	0	0	0	0	0	0	0	0	0	0	0
600	M	5	43	5	5	5	1	0	0	0	0	0	0	1	0
610	M	13	63	13	12	12	0	0	0	0	0	0	0	0	0
620	M	15	64	0	0	0	3	0	0	0	0	0	0	3	0
630	M	6	26	0	6	0	0	0	0	0	0	0	0	0	0
631	M	10	43	3	8	4	5	0	0	0	0	0	5	0	0
640	M	5	53	4	3	0	0	0	0	0	0	0	0	0	0
650	M	5	43	4	4	0	5	0	1	0	0	0	0	3	1

(To be continued)

Table 2.6.1(5c) Water Conditions of Rivers and Diseases Contraction in Survey Areas by INE Block

(Conclusion)

INE No.	Income Level *1	Respondents No. *2	Respondents Total of HHs' Members	River Conditions Odour	River Conditions Eye-sore	River Conditions Ground for Germs	Contraction of Diseases Total	Cholera	Typhoid	Paratyphoid	Infec. Hepatitis	Dysentery	Skin Sepsis & Ulc.	Diarrhoeal Diseases	Amebiasis
660	M	8	40	8	7	6	0	0	0	0	0	0	0	0	0
670	L	2	13	2	2	2	0	0	0	0	0	0	0	0	0
690	L	3	14	3	2	3	0	0	0	0	0	0	0	0	0
711	L	10	48	9	6	6	2	0	0	0	1	0	1	0	0
730	M	2	5	2	2	2	0	0	0	0	0	0	0	0	0
740	M	5	35	2	1	0	0	0	0	0	0	0	0	0	0
741	M	5	37	2	0	0	0	0	0	0	0	0	0	0	0
750	M	5	50	1	0	1	0	0	0	0	0	0	0	0	0
760	M	5	31	4	0	0	0	0	0	0	0	0	0	0	0
770	M	3	16	1	0	0	1	0	0	0	0	0	0	1	0
780	M	7	45	1	1	0	1	0	0	0	0	0	0	1	0
781	M	3	19	0	0	0	1	0	0	0	0	0	0	1	0
790	L	3	21	2	0	0	0	0	0	0	0	0	0	0	0
791	L	3	22	1	0	1	0	0	0	0	0	0	0	0	0
792	L	3	13	1	1	0	0	0	0	0	0	0	0	0	0
793	L	2	14	1	1	0	0	0	0	0	0	0	0	0	0
800	L	3	17	2	0	0	1	0	0	0	0	0	0	1	0
810	M	3	19	3	0	0	0	0	0	0	0	0	0	0	0
811	M	2	11	0	0	0	1	0	0	0	0	0	0	1	0
812	M	7	37	6	4	1	0	0	0	0	0	0	0	0	0
820	M	6	34	4	3	2	2	0	2	0	0	0	0	0	0
830	H	5	22	5	4	2	0	0	0	0	0	0	0	0	0
831	H	6	35	4	4	4	0	0	0	0	0	0	0	0	0
840	H	4	18	2	3	1	0	0	0	0	0	0	0	0	0
841	H	1	6	1	1	0	0	0	0	0	0	0	0	0	0
860	H	16	79	10	15	0	5	0	0	0	2	0	2	1	0
861	H	20	120	18	7	4	0	0	0	0	0	0	0	0	0
862	H	8	47	4	6	5	0	0	0	0	0	0	0	0	0
863	H	14	72	3	8	5	1	0	0	0	0	0	1	0	0
871	M	10	63	3	3	5	0	0	0	0	0	0	0	0	0
873	M	10	39	3	7	8	0	0	0	0	0	0	0	0	0
880	H	10	51	9	7	1	0	0	0	0	0	0	0	0	0
882	H	10	47	6	6	0	0	0	0	0	0	0	0	0	0
890	H	15	119	9	13	0	1	0	0	0	0	0	0	0	1
891	H	15	69	7	4	2	0	0	0	0	0	0	0	0	0
900	H	10	53	10	6	4	0	0	0	0	0	0	0	0	0
901	H	10	57	1	9	9	4	0	1	0	1	0	0	2	0
903	H	10	50	7	3	1	0	0	0	0	0	0	0	0	0
905	H	15	62	9	2	2	3	0	0	0	2	0	0	1	0
Total		972	5,666	573	411	244	141	1	12	1	7	13	31	71	5
Aver. Family Size			5.8												

Note: *1 Income level of "LMH" stands for "Low", "Middle" and "High", respectively.
*2 Two respondents were omitted, because households members were missing.

Table 2.6.1(6) Consciousness and Effects of River Water Quality

1. Desired River Water Quality	Number of Respondents:	958
	Number	Rate
a) Clear Water	560	58.5%
b) Suitable for bathing	39	4.1%
c) Suitable for fish to live	6	0.6%
d) Suitable for agriculture	55	5.7%
e) No eye-sore	129	13.5%
f) No obnoxious odour	154	16.1%
g) Others	15	1.6%

2. Method of Water Quality Improvement	Number of Respondents:	957
	Number	Rate
a) To establish public sewage treatment plant although people to bear a fair share of the cost.	185	19.3%
b) To regulate and control industrial wastewater although prices of industrial products may increase a little as a result.	98	10.2%
c) To stop throwing garbage into rivers.	540	56.4%
d) To introduce clean water into rivers from other water sources.	68	7.1%
e) No ideas	47	4.9%
f) Others	19	2.0%

Table 2.6.1(7) Effects on Price of Land due to Purification of River

Present Price of Land before Purification	Price Increase due to Purification of Rivers (%) Lower than 5	6 to 10	11 to 20	21 to 30	31 to 50	51 to 70	71 to 90	More than 90
1. Total Effective Respondents	(Effective Number: 208)							
a) Less than Bs.50/sq.m.	6	21	10	2	3	0	0	0
b) Bs.51 to Bs.100/sq.m.	5	5	4	3	7	0	0	4
c) Bs.101 to Bs.200/sq.m.	25	21	6	4	4	0	0	0
d) Bs.201 to Bs.500/sq.m.	22	15	8	4	4	0	0	1
e) Bs.501 to Bs.1000/sq.m.	3	3	4	2	0	0	0	2
f) Bs.1001 to Bs.2000/sq.m.	0	1	1	2	0	0	0	0
g) Bs.2001 to Bs.5000/sq.m.	0	0	1	0	0	0	0	0
h) Bs.5001 to Bs.10000/sq.m.	0	0	0	0	0	0	0	0
I) Bs.10001 to Bs.20000/sq.m.	0	1	0	0	0	0	2	1
j) More than Bs.20000/sq.m.	0	1	0	0	0	0	0	0
Price of Land (X)	Average: Bs.675/sq.m.			S.D.: Bs.2,762/sq.m.				
Price Increase (Y)	Average: 19.0%			S.D.: 24.7%				
Correlation Coefficient:	0.224							
Regression Line:	Y = 0.0020*X + 17.678							
2. High Income Areas	(Effective Number: 53, Average X: Bs.1,580/sq.m.; Y: 25.2%)							
a) Less than Bs.50/sq.m.	0	1	2	1	0	0	0	0
b) Bs.51 to Bs.100/sq.m.	0	1	0	0	1	0	0	0
c) Bs.101 to Bs.200/sq.m.	2	5	4	1	4	0	0	0
d) Bs.201 to Bs.500/sq.m.	2	5	4	4	3	0	0	1
e) Bs.501 to Bs.1000/sq.m.	2	3	2	0	0	0	0	1
f) Bs.1001 to Bs.2000/sq.m.	0	0	0	0	0	0	0	0
g) Bs.2001 to Bs.5000/sq.m.	0	0	0	0	0	0	0	0
h) Bs.5001 to Bs.10000/sq.m.	0	0	0	0	0	0	0	0
I) Bs.10001 to Bs.20000/sq.m.	0	1	0	0	0	0	2	0
j) More than Bs.20000/sq.m.	0	1	0	0	0	0	0	0
3. Middle Income Areas	(Effective Number: 88, Average X: Bs.519/sq.m.; Y: 12.2%)							
a) Less than Bs.50/sq.m.	4	9	4	1	0	0	0	0
b) Bs.51 to Bs.100/sq.m.	4	3	1	2	0	0	0	0
c) Bs.101 to Bs.200/sq.m.	11	16	2	2	0	0	0	0
d) Bs.201 to Bs.500/sq.m.	10	6	3	0	0	0	0	0
e) Bs.501 to Bs.1000/sq.m.	1	0	2	2	0	0	0	0
f) Bs.1001 to Bs.2000/sq.m.	0	1	1	1	0	0	0	0
g) Bs.2001 to Bs.5000/sq.m.	0	0	1	0	0	0	0	0
h) Bs.5001 to Bs.10000/sq.m.	0	0	0	0	0	0	0	0
I) Bs.10001 to Bs.20000/sq.m.	0	0	0	0	0	0	0	1
j) More than Bs.20000/sq.m.	0	0	0	0	0	0	0	0
4. Low Income Areas	(Effective Number: 67, Average X: Bs.166/sq.m.; Y: 23.2%)							
a) Less than Bs.50/sq.m.	2	11	4	0	3	0	0	0
b) Bs.51 to Bs.100/sq.m.	1	1	3	1	6	0	0	4
c) Bs.101 to Bs.200/sq.m.	12	0	0	1	0	0	0	0
d) Bs.201 to Bs.500/sq.m.	10	4	1	0	1	0	0	0
e) Bs.501 to Bs.1000/sq.m.	0	0	0	0	0	0	0	1
f) Bs.1001 to Bs.2000/sq.m.	0	0	0	1	0	0	0	0
g) Bs.2001 to Bs.5000/sq.m.	0	0	0	0	0	0	0	0
h) Bs.5001 to Bs.10000/sq.m.	0	0	0	0	0	0	0	0
I) Bs.10001 to Bs.20000/sq.m.	0	0	0	0	0	0	0	0
j) More than Bs.20000/sq.m.	0	0	0	0	0	0	0	0

Table 2.6.1(8) Willingness to Pay by Households Income Level

(Effective Respondents: 898 in Total)

Monthly Households Income	Willingness to Pay									
	Nothing	Bs.1	Bs.2	Bs.3	Bs.4	Bs.5	Bs.7	Bs.10	More than Bs.10	Total
1. Less than Bs.100	26	16	8	3	1	3	1	0	1	59
2. Bs.101 to Bs.200	48	46	21	8	2	5	0	5	4	139
3. Bs.201 to Bs.300	45	49	38	10	2	5	3	0	5	157
4. Bs.301 to Bs.400	37	34	28	10	8	10	1	0	1	129
5. Bs.401 to Bs.500	17	21	8	3	2	4	0	1	3	59
6. Bs.501 to Bs.600	15	27	18	2	7	9	2	2	3	85
7. Bs.601 to Bs.700	11	11	13	6	3	15	2	2	3	66
8. Bs.701 to Bs.1000	19	15	10	11	0	10	5	8	3	81
9. Bs.1001 to Bs.2000	10	13	7	11	5	14	4	6	3	73
10. Bs.2001 to Bs.4000	6	2	5	2	2	8	3	6	0	34
11. Bs.4001 to Bs.6000	2	0	0	1	0	3	0	4	2	12
12. Over Bs.6000	0	0	0	0	0	0	1	3	0	4
13. Total	236	234	156	67	32	86	22	37	28	898

	Average	Standard Deviation
14. Monthly Households Income (X)	Bs.662/month	Bs.916/month
"H" Blocks (Effective respondents: 176)	Bs.1,437/month	
"M" Blocks (Effective respondents: 467)	Bs.482/month	
"L" Blocks (Effective respondents: 255)	Bs.457/month	
15. Willingness to Pay for Purification of Rivers (Y)	Bs.2.50/month	Bs.3.26/month
"H" Blocks (Effective respondents: 176)	Bs.3.64/month	
"M" Blocks (Effective respondents: 467)	Bs.2.32/month	
"L" Blocks (Effective respondents: 255)	Bs.2.06/month	

16. Correlation Coefficient (Simple Correlation): 0.314

17. Regression Line: $Y = 0.00112^{*}X + 1.763$

18. Average Family Size of a Household: 5.77

19. Average Number of Income Earners in a Household: 1.77

Note: Excluding households which did not answer regarding household income and willlongness to pay.

Table 2.6.2(1) Distribution of Major Apartment Buildings in Central Zone by INE Block Number

No.	INE Block Number	Site Area (sq.m.)	No. of Stories	Floor Area (sq.m.)	Total Fl. Area (sq.m.)	No. of Units	No. of Occupied Units	No. of Residents	Average Family Size
1	321	3,222	14	2,260	13,066	104	100	350	3.5
2	330	491	11	343	1,342	22	20	80	4.0
3	470	1,200	15	600	5,850	78	75	216	2.9
4	640	1,000	15	300	2,250	30	29	87	3.0
5	740	2,000	26	2,000	24,100	97	97	300	3.1
6	750	1,100	19	600	29,184	76	76	30	0.4
7	821	900	19	550	6,800	68	68	272	4.0
8	821	1,800	17	960	30,736	68	68	204	3.0
9	821	690	10	533	4,880	40	39	108	2.8
10	821	3,000	25	2,100	22,597	126	126	485	3.8
11	821	600	14	378	5,292	56	45	135	3.0
12	821	500	13	340	3,900	49	47	188	4.0
13	821	400	17	220	3,192	42	28	42	1.5
14	821	900	19	500	6,464	64	60	180	3.0
15	821	600	17	380	5,100	34	34	102	3.0
16	821	750	10	420	6,765	41	41	100	2.4
17	840	363	18	150	1,785	17	12	30	2.5
18	840	500	14	280	3,640	32	32	96	3.0
19	840	300	15	150	1,960	26	25	75	3.0
20	840	1,600	26	1,100	25,000	110	110	350	3.2
21	841	500	10	190	1,900	20	20	60	3.0
22	841	750	14	320	3,874	48	48	192	4.0
23	841	1,200	17	900	7,380	64	64	190	3.0
24	841	1,650	21	1,155	10,412	78	78	312	4.0
25	850	600	24	350	5,472	44	42	126	3.0
26	850	600	15	400	4,149	22	22	80	3.6
27	850	690	12	450	9,720	36	36	120	3.3
28	850	1,500	25	529	12,646	96	90	270	3.0
29	850	400	16	250	2,424	24	24	72	3.0
30	850	1,257	18	450	5,400	37	34	87	2.6
31	850	650	16	302	2,796	54	54	162	3.0
32	850	1,050	22	600	6,050	44	34	102	3.0
33	851	580	17	310	12,495	49	49	176	3.6
34	851	300	17	160	1,920	16	16	46	2.9
35	851	630	18	420	6,562	46	32	96	3.0
36	851	450	7	240	3,128	35	33	100	3.0
37	851	600	9	348	3,375	29	29	98	3.4
38	851	1,557	8	900	5,040	48	48	144	3.0
39	851	600	25	260	6,375	50	50	150	3.0
40	851	1,000	24	500	6,400	64	64	192	3.0
41	851	750	16	400	20,160	63	59	180	3.1
Average		957	17	576	8,331	52	50	156	3.1

Table 2.6.2(2) Service Facilities in Apartment and Water Consumption

No.	INE Block Number	Service Facilities in Building (sq.m.)								Water Consumption*1	
		Restau-rant	Store	Laundary	Dry-Cleaning	Clinic	Parking Outdoor	Parking Indoor	Others	Volume (cu.m./mo)	Charge (Bs./mo)
1	321		50				320	255		2,214	1,677
2	330		36					330		500	389
3	470	72	90				75	0	192	1,910	1,446
4	640		120					50		1,931	1,500
5	740	120	2,000			140		2,000		4,100	3,000
6	750		125			90	340			3,600	3,250
7	821		160				580	0	20	1,784	1,351
8	821		550					550		1,695	1,283
9	821		236					120	256	1,100	990
10	821	364	451	45			173	1,373	234	5,400	4,100
11	821		480			60		375		1,461	1,105
12	821		200					150		770	581
13	821		40					320		779	800
14	821		1,100					465	789	2,000	2,100
15	821							300	95	800	900
16	821		70	70				300		1,101	1,437
17	840		46					225		400	406
18	840			40				180		742	520
19	840		100							330	260
20	840	70	600				300		454	3,225	2,750
21	841						84			506	381
22	841		16			32			160	1,185	849
23	841	80	600			120	120	396	210	1,200	1,317
24	841		24				240	924	250	2,200	2,600
25	850	50	864					500	330	2,139	1,620
26	850		30			1,147		615	394	1,665	1,250
27	850			120			30	180		771	650
28	850	125				77		900		2,341	1,352
29	850		70					120	404	570	430
30	850		744					330	201	1,109	980
31	850							699	932	842	750
32	850					240		270		1,500	1,200
33	851		150				120	345		1,488	1,127
34	851					100		150		414	300
35	851		72					264	107	1,100	890
36	851		45					225	140	1,250	1,000
37	851						100			1,275	964
38	851		72	100		26	255			1,500	1,000
39	851							360		1,556	1,350
40	851					780			156	1,578	1,194
41	851							150		983	786
Average										1,537	1,264
Average per Occupied Unit										31	25

Table 2.6.2(3) Consciousness and Utilization of River

(Residents In Apartment)

1. Number of Respondents: 81

2. Impoortance of River Condition

Rate of people who think purification of a river near their home is important

	Number	Rate
a) Yes:	78	98.0%
b) No:	3	2.0%

3. Existing Use of the River

3.1 Use of the River

	Number	Rate
a) Washing	3	3.7%
b) Irrigation and agricultural use	4	4.9%
c) Recreation use	2	2.5%
d) Sewerage	51	63.0%
e) Garbage dumping	14	17.3%
f) No answer	2	2.5%
g) Others	5	6.2%

3.2 Conditions of the river around respondents (Plural answers)

	Number	Rate
a) No problems	33	40.7%
b) Obnoxious odour	38	46.9%
c) Eye-sore	18	22.2%
d) Breeding ground of mosquitoes and germs	2	2.5%
e) No answer	3	3.7%
f) Others	3	3.7%

Table 2.6.2(4) Contraction of Diseases

(Residents in Apartment)

Disease	Number of Patients	Medication Period (days)		Cost (Bs.)
		Outside Hospita	In Hospital	
1. Cholera	0	0	0	0
2. Typhoid	2	-	2	4,000
	4	4	-	1,160
3. Paratyphoid	2	3	0	2,150
4. Infective Hapatitis	1	-	1	0
	2	2	-	1,030
5. Enteroviruses	0	0	0	0
6. Shigelosis	1	1	0	0
7. Dysentery	1	1	0	0
8. Skin Sepsis and Ulcers	2	2	0	0
9. Pseudomonas	0	0	0	0
10. Nocardiosis	1	1	0	50
11. Diarrhoeal Diseases	13	10	0	1,470
12. Amebiasis	4	4	0	0
13. Giardiasis	0	0	0	0
Total	33	28	3	9,860

Table 2.6.2(4a) Water Conditions of Rivers and Diseases Contraction in Survey Areas by INE Block

INE No.	Income Level *1	Respondents No. *2	Respondents Total of HHs' Members	River Conditions Odour	River Conditions Eye-sore	River Conditions Ground for Germs	Contraction of Diseases Total	Typhoid	Paratyphoid	Infec. Hepatitis	Shigellosis	Dysentery	Skin Sepsis & Ulc.	Nocardiosis	Diarrhoeal Diseases	Amebiasis
321	H	9	38	7	2	0	8	3	0	0	0	0	1	1	2	1
470	M	2	6	2	0	0	2	0	0	0	0	0	0	0	2	0
640	M	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0
740	M	10	32	3	5	0	0	0	0	0	0	0	0	0	0	0
750	M	4	16	2	0	0	2	1	0	1	0	0	0	0	0	0
821	M	33	104	9	9	1	13	1	1	2	1	1	1	0	4	2
840	H	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
850	M	8	31	6	1	0	8	1	1	0	0	0	0	0	5	1
851	M	13	39	8	1	1	0	0	0	0	0	0	0	0	0	0
Total		81	270	38	18	2	33	6	2	3	1	1	2	1	13	4
Ave.Family Size			3.3													

Note: *1 Income level of "LMH" stands for "Low", "Middle" and "High", respectively.

Table 2.6.2(5) Consciousness and Effects of River Water Quality

(Residents in Apartment)

1. Desired River Water Quality	Number of Respondents:	81
	Number	Rate
a) Clear Water	52	64.2%
b) Suitable for bathing	1	1.2%
c) Suitable for fish to live	3	3.7%
d) Suitable for agriculture	8	9.9%
e) No eye-sore	3	3.7%
f) No obnoxious odour	10	12.3%
g) Others	4	4.9%

2. Method of Water Quality Improvement	Number of Respondents:	80
	Number	Rate
a) To establish public sewage treatment plant although people to bear a fair share of the cost.	40	50.0%
b) To regulate and control industrial wastewater although prices of industrial products may increase a little as a result.	22	27.5%
c) To stop throwing garbage into rivers.	14	17.5%
d) To introduce clean water into rivers from other water sources.	1	1.3%
e) No ideas	1	1.3%
f) Others	2	2.5%

Table 2.6.2(6) Effects on Price of Land due to Purification of River

Present Price of Land before Purification	Price Increase due to Purification of Rivers (%)							
	Lower than 5	6 to 10	11 to 20	21 to 30	31 to 50	51 to 70	71 to 90	More than 90
Total Effective Respondents	(Effective Number: 24)							
a) Less than Bs.50/sq.m.	1	0	0	0	0	0	0	0
b) Bs.51 to Bs.100/sq.m.	0	0	0	0	0	0	0	0
c) Bs.101 to Bs.200/sq.m.	1	0	0	0	0	0	0	0
d) Bs.201 to Bs.500/sq.m.	3	2	1	0	1	0	0	1
e) Bs.501 to Bs.1000/sq.m.	2	1	2	0	3	0	0	1
f) Bs.1001 to Bs.2000/sq.m.	0	0	1	3	1	0	0	0
g) Bs.2001 to Bs.5000/sq.m.	0	0	0	0	0	0	0	0
h) Bs.5001 to Bs.10000/sq.m.	0	0	0	0	0	0	0	0
i) Bs.10001 to Bs.20000/sq.m.	0	0	0	0	0	0	0	0
j) More than Bs.20000/sq.m.	0	0	0	0	0	0	0	0

Price of Land (X)	Average Bs.702/sq.m.	S.D.:	Bs.373/sq.m.
Price Increase (Y)	Average 26.3%	S.D.:	27.7%
Correlation Coefficient:	0.0871		
Regression Line:	Y = 0.00634*X + 21.79		

Table 2.6.2(7) Willingness to Pay by Households Income Level

(Effective Respondents: 78 in Total)

Monthly Households Income	Willingness to Pay									
	Nothing	Bs.1	Bs.2	Bs.3	Bs.4	Bs.5	Bs.7	Bs.10	More than Bs.10	Total
1. Less than Bs.100	0	0	0	0	0	0	0	0	0	0
2. Bs.101 to Bs.200	1	0	0	0	0	0	0	0	0	1
3. Bs.201 to Bs.300	2	0	0	0	0	0	0	0	0	2
4. Bs.301 to Bs.400	0	0	0	0	0	0	0	0	0	0
5. Bs.401 to Bs.500	0	0	2	0	0	2	0	0	0	4
6. Bs.501 to Bs.600	1	0	1	0	0	0	0	1	0	3
7. Bs.601 to Bs.700	0	1	0	0	0	2	0	2	0	5
8. Bs.701 to Bs.1000	2	2	0	2	0	4	2	1	0	13
9. Bs.1001 to Bs.2000	4	2	1	1	1	6	3	8	1	27
10. Bs.2001 to Bs.4000	0	0	2	1	0	4	2	7	1	17
11. Bs.4001 to Bs.6000	0	0	0	0	0	0	0	1	1	2
12. Over Bs.6000	0	0	0	0	0	0	0	1	3	4
13. Total	10	5	6	4	1	18	7	21	6	78

	Average	Standard Deviation
14. Monthly Households Income (X)	Bs.1,923/month	Bs.1,657/month
15. Willingness to Pay for Purification of Rivers (Y)	Bs.6.05/month	Bs.4.34/month

16. Correlation Coefficient (Simple Correlation): 0.573

17. Regression Equation: $Y = 0.0015^{*}X + 3.1677$

18. Average Family Size of a Household: 3.32

19. Average Number of Income Earners in a Household: 1.55

Table 2.6.3(1) Distribution of Hotels in Central Zone

No	INE Block Number	No. of Guest Rooms	No. of Beds	Area of Guest Room (sq.m.)	Area of Hotel Site (sq.m.)	Total Floor Area of Hotel (sq.m.)	No. of Employees
1	470	24	40	630	450	900	3
2	490	101	155	2,020	640	2,271	189
3	490	20	32	180	465	212	1
4	490	17	31	170	315	500	3
5	490	71	114	550	800	1,000	7
6	631	20	40	320	550	1,000	3
7	631	53	73	2,173	250	3,000	34
8	740	180	347	5,940	920	15,600	0
9	740	117	163	4,752	1,200	7,600	79
10	821	75	150	900	256	2,371	54
11	850	345	688	14,234	4,202	2,502	270

Table 2.6.3(2) Major Service Facilities in Hotels

Hotel No.*1	Restaurant	Lounge	Sauna	Swimming Pool	Shopping Store	Dry Cleaning Loundly	Dry Cleaning Shop	Others	Total
1. Number of Facilities									
1	-	-	-	-	-	1	-	-	1
2	1	-	1	1	-	-	-	-	3
3	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-
6	1	1	-	-	-	1	-	-	3
7	1	1	-	-	-	1	-	-	3
8	2	1	1	1	8	1	1	2	17
9	1	1	-	-	4	1	-	4	11
10	1	1	-	-	-	1	-	-	3
11	2	3	1	1	15	1	1	7	31
2. Area of Facilities (sq.m.)									
1	-	-	-	-	-	10	-	-	10
2	63	-	54	110	120	-	-	-	347
3	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-
6	8,205	20	-	-	-	15	-	-	8,240
7	120	50	-	-	-	60	-	-	230
8	400	300	235	65	170	100	35	300	1,605
9	96	161	-	-	69	32	-	352	710
10	-	-	-	-	-	-	-	-	-
11	616	491	476	-	279	547	-	5,019	7,428

Note: *1 The hotel number corresponds to the one in Table 2.6.3(1).

Table 2.6.3(3) Number of Guests by Month and by Year: 1987-1991

Item	Hotel Number Corresponding to Table 2.6.3(1)										
	1	2	3	4	5	6	7	8	9	10	11
1. Monthly Number of Guests in 1991											
January	98	377	203	417	1,384	70	30	-	1,957	2,686	1,012
February	83	392	185	442	903	75	35	-	1,297	2,225	856
March	70	504	180	676	1,036	78	40	-	2,035	2,703	1,124
April	94	417	190	531	1,015	80	35	-	1,651	2,442	1,177
May	95	315	243	335	971	90	50	-	1,338	2,700	940
June	83	424	230	473	851	95	50	-	1,801	2,570	905
July	102	427	255	464	1,229	95	60	-	2,198	3,183	923
August	95	405	301	472	1,034	95	60	-	2,122	2,901	902
September	77	448	324	422	903	95	55	-	1,752	2,538	1,013
October	91	506	280	451	788	90	35	-	2,209	2,634	1,774
November	78	549	311	391	877	85	30	-	2,018	2,618	1,227
December	103	447	355	543	1,066	40	15	-	1,571	1,980	767
Total	1,069	5,211	3,057	5,617	12,057	988	495	-	21,949	31,180	12,620
2. Annual Number of Guests											
1991	1,069	5,211	3,057	5,617	12,057	988	370	-	24,622	31,176	12,685
1990	1,152	-	2,880	6,720	14,016	1,368	360	-	29,134	31,140	16,267
1989	1,003	-	3,055	7,652	14,102	1,338	350	-	27,201	32,580	20,333
1988	987	-	3,500	7,152	17,807	1,368	-	-	31,067	-	20,339
1987	985	-	3,380	6,887	17,636	1,365	-	-	22,689	-	18,299
Average	1,039	-	3,174	6,806	15,124	1,285	360	-	26,943	31,632	17,585

Table 2.6.4(1) Distribution of Foreign Tourist Respondents by Nationality

Nationality	No. of Respondents					Average Age	Sex		Marriage Status	
	Total Number	Purpose of Visit					Male	Female	Single	Married
		Hol*1	Bus*2	Off*3	Oth*4					
1 American	10	7	0	2	1	38.1	8	2	6	4
2 Argentine	7	2	4	0	1	33.9	6	1	4	3
3 Australian	7	7	0	0	0	24.6	4	3	6	1
4 Belgian	1	1	0	0	0	39.0	0	1	0	1
5 Brazilian	1	1	0	0	0	24.0	0	1	1	0
6 British	8	7	1	0	0	30.8	5	3	5	3
7 Canadian	3	3	0	0	0	36.0	3	0	2	1
8 Chilean	5	5	0	0	0	25.2	4	1	5	0
9 Colombian	2	2	0	0	0	26.0	1	1	2	0
10 Czechoslovak	1	1	0	0	0	39.0	1	0	0	1
11 Danish	3	3	0	0	0	23.3	1	2	3	0
12 Dutch	3	3	0	0	0	27.7	2	1	3	0
13 Ecuadorian	4	1	2	0	1	31.3	2	2	1	3
14 French	6	6	0	0	0	28.8	2	4	6	0
15 German	9	4	5	0	0	29.9	6	3	5	4
16 Israeli	1	1	0	0	0	28.0	1	0	1	0
17 Italian	1	1	0	0	0	24.0	1	0	1	0
18 Japanese	2	0	2	0	0	38.0	2	0	0	2
19 Mexican	1	1	0	0	0	26.0	1	0	1	0
20 New Zealander	1	1	0	0	0	23.0	1	0	1	0
21 Paraguayan	2	2	0	0	0	27.0	1	1	2	0
22 Peruvian	6	1	3	0	2	25.7	4	2	5	1
23 Spanish	6	1	2	2	1	35.3	5	1	4	2
24 Swedish	1	1	0	0	0	26.0	1	0	1	0
25 Swiss	2	2	0	0	0	23.0	1	1	2	0
26 Taiwanese	1	0	1	0	0	31.0	0	1	0	1
27 Venezuelan	3	1	1	0	1	25.7	1	2	2	1
28 Yugoslav	2	2	0	0	0	33.0	1	1	0	2
Total	99	67	21	4	7	30.2	65	34	69	30

Note: *1 Holiday
*2 Business
*3 Official
*4 Others

Table 2.6.4(2) Tourists' Consciousness of Water Quality of Rivers by Nationality

Nationality	Average Times of Visits in the Last Five Years	Average Times of Visits in the Coming Five Years	Consciousness of Water Quality as Contaminated		Average Times of Visits in the Next 5 Yrs after River Purification
			Yes	No	
1 American	1.4	2.2	5	5	1.8
2 Argentine	1.9	1.6	6	1	2.9
3 Australian	1.1	1.9	3	4	1.4
4 Belgian	2.0	3.0	1	0	5.0
5 Brazilian	3.0	5.0	1	0	5.0
6 British	1.8	1.3	5	3	1.5
7 Canadian	2.7	1.7	1	2	2.7
8 Chilean	1.0	2.2	3	2	1.2
9 Colombian	1.5	4.0	1	1	5.0
10 Czechoslovak	2.0	3.0	0	1	3.0
11 Danish	1.0	1.7	3	0	4.3
12 Dutch	1.3	0.3	3	0	0.7
13 Ecuadorian	1.0	2.5	1	3	2.5
14 French	1.0	1.8	3	3	1.8
15 German	1.4	2.1	5	4	1.6
16 Israeli	1.0	1.0	1	0	3.0
17 Italian	2.0	1.0	1	0	5.0
18 Japanese	1.0	1.0	2	0	2.0
19 Mexican	1.0	3.0	1	0	3.0
20 New Zealander	1.0	1.0	1	0	3.0
21 Paraguayan	2.0	3.5	1	1	0.0
22 Peruvian	4.0	5.5	4	2	6.7
23 Spanish	1.5	3.8	6	0	4.5
24 Swedish	1.0	3.0	1	0	5.0
25 Swiss	1.5	1.0	1	1	1.0
26 Taiwanese	2.0	5.0	0	1	5.0
27 Venezuelan	2.3	3.7	3	0	3.7
28 Yugoslav	1.0	3.5	2	0	4.0
29 Europe	1.4	2.0	31	12	2.5
30 North America	1.6	2.1	7	7	2.1
31 South America	2.1	3.2	20	10	3.4
32 Middle East	1.0	1.0	1	0	3.0
33 Asia	1.3	2.3	2	1	3.0
34 Oceania	1.1	1.8	4	4	1.6
Average	1.6	2.4	65	34	2.7

3. SUMMARY OF UNIT PRICES

- The data were provided by HAM-LA PAZ.
- The prices and the exchange rate between US$ and Bs. are based on those in June, 1992.
- These unit prices were used for the estimation of the construction costs for the main sewer interceptor and the wastewater treatment plant.

CATALOGO DE PRECIOS UNITARIOS ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
A0050	ABRAZADERA DE FIERRO DE 4" DE DIAMETRO ALT. 20 CM.	PZA	MAT. :	6.26	1.61
			H.-E.:	0.00	0.00
			M. O.:	9.38	2.43
			REC. :	15.74	4.07
			TOTAL:	31.38	8.11
M0025	ABUCHARDADO DE PIEDRA	M2	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	3.00	0.78
			REC. :	4.57	1.19
			TOTAL:	7.57	1.97
A0004	ACERA DE CONCRETO DE 4 CMS DE ESPESOR CON BASE DE PIEDRA	M2	MAT. :	12.20	3.15
			H.-E.:	0.00	0.00
			M. O.:	9.24	2.40
			REC. :	16.90	4.38
			TOTAL:	38.34	9.93
A0002	ACERA DE CONCRETO 1:2:3 DE 10 CMS DE ESPESOR NO INCLUYE CONTRAPISO	M2	MAT. :	19.95	5.15
			H.-E.:	0.00	0.00
			M. O.:	4.92	1.28
			REC. :	12.12	3.14
			TOTAL:	36.99	9.57
A0006	ACERA DE CONCRETO 1:2:3 DE 0.075 M. DE ESPESOR NO INCLUYE CONTRAPISO	M2	MAT. :	16.50	4.27
			H.-E.:	0.00	0.00
			M. O.:	4.31	1.12
			REC. :	10.40	2.71
			TOTAL:	31.21	8.10
A0007	ACERA DE HORMIGON DE 0.075 M DE ESPESOR, NO INCLUYE CONTRAPISO (SEGUNDO ANALISIS)	M2	MAT. :	13.67	3.53
			H.-E.:	0.00	0.00
			M. O.:	2.74	0.70
			REC. :	7.34	1.90
			TOTAL:	23.75	6.13
R0013	ACERAS RETIRO DE LOSA DE PIEDRA (BLOQUES)	M2	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	1.97	0.51
			REC. :	3.00	0.79
			TOTAL:	4.97	1.30
A0005	ACERO ESTRUCTURAL	KG	MAT. :	2.57	0.66
			H.-E.:	0.00	0.00
			M. O.:	0.33	0.08
			REC. :	1.10	0.27
			TOTAL:	4.00	1.01

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
A0008	ACERO ESTRUCTURAL (SEGUNDO ANALISIS)	KG	MAT. :	2.45	0.63
			H.-E.:	0.00	0.00
			M. O.:	0.33	0.08
			REC. :	1.08	0.26
			TOTAL:	3.86	0.97
A0011	ADOQUINADO CON ADOQUINES DE COLOR BLANCO	M2	MAT. :	62.20	15.90
			H.-E.:	0.00	0.00
			M. O.:	4.62	1.20
			REC. :	21.47	5.52
			TOTAL:	88.29	22.62
A0001	ADOQUINADO DE CALZADA PROVISION Y TRANSPORTE	M2	MAT. :	25.90	6.66
			H.-E.:	0.00	0.00
			M. O.:	4.62	1.20
			REC. :	13.04	3.37
			TOTAL:	43.56	11.23
A0003	ADOQUINADO DE CALZADA (NO INCLUYE PROVISION DEL ADOQUIN)	M2	MAT. :	2.80	0.72
			H.-E.:	0.00	0.00
			M. O.:	4.62	1.20
			REC. :	7.68	2.00
			TOTAL:	15.10	3.92
A0013	ADOQUINADO HORMIGONADO CON PROVISION Y TRANSPORTE	M2	MAT. :	30.19	7.77
			H.-E.:	0.00	0.00
			M. O.:	13.86	3.59
			REC. :	28.11	7.26
			TOTAL:	72.16	18.62
A0012	ADOQUINADO TIPO PARIS HORMIGONADO CON PROVISION	M2	MAT. :	42.09	10.83
			H.-E.:	0.00	0.00
			M. O.:	13.86	3.59
			REC. :	30.87	7.98
			TOTAL:	86.82	22.40
A0009	AISLANTE TERMICO CON PLASTOFORMO E=6 CM	M2	MAT. :	19.09	4.93
			H.-E.:	0.00	0.00
			M. O.:	1.00	0.26
			REC. :	5.96	1.54
			TOTAL:	26.05	6.73
A0021	ALFOMBRA TIPO TAPIZON 2	M2	MAT. :	42.32	10.94
			H.-E.:	0.00	0.00
			M. O.:	3.93	1.01
			REC. :	15.80	4.08
			TOTAL:	62.05	16.03

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
A0020	ALUMBRADO PUBLICO (PUNTO) TIPO SATURNO CON UNA LUMINARIA	PZA	MAT. :	1,581.10	408.62
			H.-E.:	0.00	0.00
			M. O.:	16.50	4.26
			REC. :	391.95	101.28
			TOTAL:	1,989.55	514.16
A0019	ALUMBRADO PUBLICO(PUNTO) C/POSTE RECTO C/BRAZO DOBLE C/LUMINARIAS 250 W VAPOR HG	PZA	MAT. :	4,609.60	1,190.75
			H.-E.:	0.00	0.00
			M. O.:	16.50	4.26
			REC. :	1,094.56	282.74
			TOTAL:	5,720.66	1,477.75
A0049	ANCLAJES DE FIERRO E= 5 MM DE 0.10 x 0.60 MT__	PZA	MAT. :	22.45	5.80
			H.-E.:	0.00	0.00
			M. O.:	9.39	2.43
			REC. :	19.51	5.04
			TOTAL:	51.35	13.27
A0014	ANGULARES DE 3"x3"x1/4" PROVISION Y COLOCACION EMPERNADOS	ML	MAT. :	26.10	6.72
			H.-E.:	0.00	0.00
			M. O.:	1.37	0.35
			REC. :	8.15	2.09
			TOTAL:	35.62	9.16
A0024	ANILLO METALICO ESPESOR 1/4" ALTURA 1.8 MT FORMA HEXAGONAL 80 CM LADO	PZA	MAT. :	1,510.16	390.47
			H.-E.:	0.00	0.00
			M. O.:	25.04	6.48
			REC. :	388.48	100.45
			TOTAL:	1,923.68	497.40
A0028	AREA VERDE CON RAY - GRASS	M2	MAT. :	2.91	0.75
			H.-E.:	0.00	0.00
			M. O.:	1.50	0.39
			REC. :	2.97	0.77
			TOTAL:	7.38	1.91
A0029	AREA VERDE EN PENDIENTE CON RAY-GRASS	M2	MAT. :	4.54	1.17
			H.-E.:	0.00	0.00
			M. O.:	1.50	0.39
			REC. :	3.34	0.87
			TOTAL:	9.38	2.43
A0018	ARMADO DE COLCHONETAS RENO DE 25 CM (CON PROVISION DE MALLA)	M2	MAT. :	21.42	5.53
			H.-E.:	0.00	0.00
			M. O.:	2.76	0.71
			REC. :	9.17	2.37
			TOTAL:	33.35	8.61

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
A0017	ARMADO DE COLCHONETAS RENO DE 25 CM (SIN PROVISION DE MALLA)	M2	MAT. :	9.81	2.53
			H.-E.:	0.00	0.00
			M. O.:	2.76	0.71
			REC. :	6.48	1.68
			TOTAL:	19.05	4.92
A0026	ARMADO DE GAVIONES (INCLUYE MALLA)	M3	MAT. :	103.68	26.79
			H.-E.:	0.00	0.00
			M. O.:	16.00	4.13
			REC. :	48.41	12.51
			TOTAL:	168.09	43.43
A0025	ARMADO DE GAVIONES (No incluye malla)	M3	MAT. :	49.03	12.67
			H.-E.:	0.00	0.00
			M. O.:	16.00	4.13
			REC. :	35.73	9.24
			TOTAL:	100.76	26.04
A0125	ARMADO DE GAVIONES (NO INCLUYE MALLA NI PIEDRA)	M3	MAT. :	7.03	1.82
			H.-E.:	0.00	0.00
			M. O.:	16.00	4.13
			REC. :	25.99	6.71
			TOTAL:	49.02	12.66
A0016	ARMADO DE GAVIONES DE 1/2 METRO (SIN PROVISION DE MALLA)	M3	MAT. :	47.33	12.23
			H.-E.:	0.00	0.00
			M. O.:	20.00	5.17
			REC. :	41.43	10.72
			TOTAL:	108.76	28.12
A1001	ASFALTO LIQUIDO (SUMINISTRO)	LT	MAT. :	1.35	0.34
			H.-E.:	0.12	0.03
			M. O.:	0.00	0.00
			REC. :	0.35	0.08
			TOTAL:	1.82	0.45
A0015	ASIENTOS DE MADERA DE 2" x 14"	ML	MAT. :	48.54	12.54
			H.-E.:	0.30	0.08
			M. O.:	13.88	3.57
			REC. :	32.46	8.36
			TOTAL:	95.18	24.55
B0009	BAJANTE DE FIERRO FUNDIDO DE 4"	ML	MAT. :	65.11	16.86
			H.-E.:	0.00	0.00
			M. O.:	5.01	1.29
			REC. :	22.73	5.87
			TOTAL:	92.85	24.02

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
B0021	BAJANTES DE CALAMINA DE 4" DE DIAMETRO	ML	MAT. :	9.90	2.56
			H.-E.:	0.00	0.00
			M. O.:	4.18	1.09
			REC. :	8.67	2.25
			TOTAL:	22.75	5.90
B0022	BAJANTES DE CALAMINA DE 12" DE DIAMETRO	ML	MAT. :	40.00	10.33
			H.-E.:	0.00	0.00
			M. O.:	4.18	1.09
			REC. :	15.65	4.06
			TOTAL:	59.83	15.48
B0051	BANCOS DE PARQUE REFACCION	PZA	MAT. :	23.26	6.04
			H.-E.:	0.00	0.00
			M. O.:	13.00	3.37
			REC. :	25.20	6.53
			TOTAL:	61.46	15.94
B0050	BANCOS DE PARQUE COLOCACION Y PROVISION	PZA	MAT. :	216.64	55.98
			H.-E.:	0.00	0.00
			M. O.:	7.74	2.01
			REC. :	77.39	20.02
			TOTAL:	301.77	78.01
C0024	BARANDA DE F.G. DE 2" PROVISION Y COLOCACION	ML	MAT. :	78.69	20.16
			H.-E.:	0.00	0.00
			M. O.:	11.19	2.89
			REC. :	35.29	9.07
			TOTAL:	125.17	32.12
B0003	BARANDADO BALAUSTRE	ML	MAT. :	44.89	11.61
			H.-E.:	0.00	0.00
			M. O.:	21.97	5.70
			REC. :	43.88	11.38
			TOTAL:	110.74	28.69
B0008	BARANDADO DE Ho.Ao.	ML	MAT. :	50.82	13.12
			H.-E.:	3.10	0.80
			M. O.:	20.98	5.44
			REC. :	44.46	11.52
			TOTAL:	119.36	30.88
B0007	BARANDADO METALICO	ML	MAT. :	40.40	10.45
			H.-E.:	13.60	3.50
			M. O.:	5.01	1.29
			REC. :	20.16	5.20
			TOTAL:	79.17	20.44

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
B0031	BARNIZ CON BROCHA SOBRE MADERA	M2	MAT. :	4.23	1.09
			H.-E.:	0.15	0.04
			M. O.:	2.51	0.65
			REC. :	4.84	1.26
			TOTAL:	11.73	3.04
B0004	BARRERAS PEATONALES ESQUINERAS	PZA	MAT. :	62.30	16.02
			H.-E.:	0.00	0.00
			M. O.:	8.42	2.18
			REC. :	23.02	5.93
			TOTAL:	93.74	24.13
B0005	BARRERAS PEATONALES TIPO I	ML	MAT. :	163.10	41.93
			H.-E.:	0.00	0.00
			M. O.:	13.91	3.60
			REC. :	52.01	13.40
			TOTAL:	229.02	58.93
B0006	BARRERAS PEATONALES TIPO II	ML	MAT. :	130.31	33.46
			H.-E.:	0.00	0.00
			M. O.:	10.15	2.63
			REC. :	40.57	10.44
			TOTAL:	181.03	46.53
B1000	BASE/ PAVIMENTO	M3	MAT. :	31.61	8.15
			H.-E.:	22.37	5.78
			M. O.:	1.32	0.34
			REC. :	14.54	3.76
			TOTAL:	69.84	18.03
B0027	BATERIAS COMPLETAS P/INODORO COLOCACION Y PROVISION	PZA	MAT. :	73.50	19.00
			H.-E.:	0.00	0.00
			M. O.:	10.01	2.58
			REC. :	32.30	8.33
			TOTAL:	115.81	29.91
B0028	BEBEDERO PROVISION Y COLOCACION	PZA	MAT. :	92.90	24.00
			H.-E.:	0.00	0.00
			M. O.:	9.24	2.40
			REC. :	35.62	9.22
			TOTAL:	137.76	35.62
B0025	BLOQUE DE MORTERO DE CONC. 1:4 PARA RAYAS SEP. DE CARRILES DE 0.15 X 0.15 X 0.30	PZA	MAT. :	2.61	0.69
			H.-E.:	0.00	0.00
			M. O.:	0.45	0.12
			REC. :	1.29	0.35
			TOTAL:	4.35	1.16

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
B0001	BORDILLO DE SEPARACION (0.35x0.12) LONG:0.4 M.	PZA	MAT. :	10.81	2.80
			H.-E.:	0.00	0.00
			M. O.:	2.55	0.66
			REC. :	6.39	1.66
			TOTAL:	19.75	5.12
B0002	BORDILLO ORNAMENTAL DE LADRILLO GAMBOTE	ML	MAT. :	22.26	5.74
			H.-E.:	0.00	0.00
			M. O.:	25.41	6.58
			REC. :	43.85	11.35
			TOTAL:	91.52	23.67
C0018	BORDILLO PREFABRICADO DE HORMIGON DE 27 X 30 CM L=0.80 M	PZA	MAT. :	8.85	2.28
			H.-E.:	0.00	0.00
			M. O.:	4.00	1.03
			REC. :	9.44	2.43
			TOTAL:	22.29	5.74
C0019	BORDILLO PREFABRICADO DE HORMIGON DE 27 X 30 CM L=0.30 M	PZA	MAT. :	2.65	0.68
			H.-E.:	0.00	0.00
			M. O.:	1.60	0.41
			REC. :	3.99	1.02
			TOTAL:	8.24	2.11
B0026	BOTAAGUAS DE CEMENTO SOBRE MURO DE 0.12	ML	MAT. :	6.67	1.72
			H.-E.:	0.00	0.00
			M. O.:	5.00	1.29
			REC. :	10.11	2.60
			TOTAL:	21.78	5.61
P0038	BOTAGUAS DE LADRILLO GAMBOTE DE CANTO MORTERO 1:4	ML	MAT. :	5.68	1.47
			H.-E.:	0.00	0.00
			M. O.:	4.16	1.08
			REC. :	7.65	1.98
			TOTAL:	17.49	4.53
C0007	CAJA INTERCEPTORA PROVISION Y COLOCACION	PZA	MAT. :	33.85	8.75
			H.-E.:	0.00	0.00
			M. O.:	15.02	3.87
			REC. :	30.72	7.92
			TOTAL:	79.59	20.54
C0006	CAJA RECEPTORA PLUVIAL PROVISION Y COLOCACION	PZA	MAT. :	40.33	10.42
			H.-E.:	0.00	0.00
			M. O.:	15.02	3.87
			REC. :	32.22	8.30
			TOTAL:	87.57	22.59

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
C0026	CALAMINA PLANA	M2	MAT. :	20.72	5.44
	PROVISION Y COLOCACION		H.-E.:	0.00	0.00
			M. O.:	2.70	0.70
			REC. :	8.92	2.34
			TOTAL:	32.34	8.48
C0037	CAMARA DE INSPECCION	PZA	MAT. :	459.93	118.74
	DE MAMPOSTERIA DE PIEDRA		H.-E.:	0.00	0.00
	H = 2 M		M. O.:	199.92	51.83
			REC. :	411.09	106.45
			TOTAL:	1,070.94	277.02
C0040	CAMARA DE INSPECCION	PZA	MAT. :	125.45	32.40
	0.6X0.6X1.00 DE MAMPOSTERIA		H.-E.:	0.00	0.00
			M. O.:	62.50	16.20
			REC. :	124.26	32.18
			TOTAL:	312.21	80.78
C0013	CAMARA DE INSPECCION DE	PZA	MAT. :	83.11	21.51
	0.6 x 0.6 x 1		H.-E.:	0.00	0.00
	(LADRILLO GAMBOTE)		M. O.:	42.02	10.85
			REC. :	92.74	23.96
			TOTAL:	217.87	56.32
C0030	CAMARA DE INSPECCION SIMPLE	PZA	MAT. :	84.65	21.89
	DE 0.60 x 0.60 x 1 MT		H.-E.:	0.00	0.00
			M. O.:	37.26	9.66
			REC. :	76.37	19.79
			TOTAL:	198.28	51.34
C0039	CAMARAS DE DRENAJE	PZA	MAT. :	164.05	42.36
	INCLUYE CORDON Y TAPA		H.-E.:	9.09	2.35
			M. O.:	49.95	12.94
			REC. :	116.23	30.09
			TOTAL:	339.32	87.74
C0012	CAMARAS DE INSPECCION	UN	MAT. :	402.08	103.73
			H.-E.:	0.00	0.00
			M. O.:	85.92	22.27
			REC. :	201.88	52.21
			TOTAL:	689.88	178.21
00013	CANALETA	ML	MAT. :	9.90	2.56
	DE CALAMINA		H.-E.:	0.00	0.00
			M. O.:	4.49	1.17
			REC. :	9.13	2.39
			TOTAL:	23.52	6.12

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
C1002	CARPETA ASFALTICA e = 5 cm	M2	MAT. :	3.49	0.90
			H.-E.:	1.50	0.39
			M. O.:	0.00	0.00
			REC. :	1.16	0.29
			TOTAL:	6.15	1.58
C0029	CARPETA DE CASCOTES	M2	MAT. :	27.90	7.19
			H.-E.:	0.00	0.00
			M. O.:	0.00	0.00
			REC. :	6.48	1.67
			TOTAL:	34.38	8.86
C0027	CARPETA DE CONCRETO DE 4 CM SIN CONTRAPISO	M2	MAT. :	8.00	2.06
			H.-E.:	0.00	0.00
			M. O.:	2.92	0.76
			REC. :	6.31	1.64
			TOTAL:	17.23	4.46
C0021	CARPETA DE HORMIGON DE 12 CM 1:2:3 NO INCLUYE CONTRAPISO	M2	MAT. :	22.19	5.73
			H.-E.:	0.00	0.00
			M. O.:	5.84	1.51
			REC. :	14.05	3.64
			TOTAL:	42.08	10.88
C0005	CASCAJO PARA DRENAJE	M3	MAT. :	35.00	9.04
			H.-E.:	0.00	0.00
			M. O.:	1.50	0.39
			REC. :	10.42	2.69
			TOTAL:	46.92	12.12
C1003	CEMENTO ASFALTICO (SUMINISTRO)	KG	MAT. :	1.64	0.42
			H.-E.:	0.00	0.00
			M. O.:	0.00	0.00
			REC. :	0.38	0.10
			TOTAL:	2.02	0.52
C0112	CEPILLADO Y LUSTRADO DE PISO DE MADERA (4 MANOS)	M2	MAT. :	3.08	0.80
			H.-E.:	0.00	0.00
			M. O.:	2.25	0.58
			REC. :	4.13	1.07
			TOTAL:	9.46	2.45
CH037	CHAPA DE 1 GOLPE YALE PROVISION Y COLOCACION	PZA	MAT. :	75.00	19.38
			H.-E.:	0.00	0.00
			M. O.:	2.32	0.60
			REC. :	20.93	5.41
			TOTAL:	98.25	25.39

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
CH038	CHAPA DE 2 GOLPES YALE PROVISION Y COLOCACION	PZA	MAT. :	100.00	25.84
			H.-E.:	0.00	0.00
			M. O.:	2.32	0.60
			REC. :	26.73	6.91
			TOTAL:	129.05	33.35
C0010	CIELO FALSO-INCLUYE YESO MADERAMEN Y MALLA	M2	MAT. :	29.24	7.50
			H.-E.:	0.00	0.00
			M. O.:	13.21	3.43
			REC. :	26.89	6.96
			TOTAL:	69.34	17.89
J0038	CIMIENTOS DE H.C. 1:3:5 40% DE PIEDRA DESPLAZADORA	M3	MAT. :	107.04	27.64
			H.-E.:	0.00	0.00
			M. O.:	24.75	6.42
			REC. :	62.53	16.18
			TOTAL:	194.32	50.24
H0004	COLUMNA DE HORMIGON ARMADO VISTO (SIN FIERRO) 0.3x0.3	M3	MAT. :	514.15	132.84
			H.-E.:	17.02	4.40
			M. O.:	104.58	27.12
			REC. :	282.46	73.13
			TOTAL:	918.21	237.49
H0003	COLUMNA DE HORMIGON ARMADO (SIN FIERRO) .30 X .30 MTS.	M3	MAT. :	363.75	93.94
			H.-E.:	17.02	4.40
			M. O.:	85.86	22.26
			REC. :	219.07	56.70
			TOTAL:	685.70	177.30
C0038	COLUMNAS DE MADERA MARA DE 4 X 4 " X 3 M BARNIZADAS	PZA	MAT. :	171.19	44.49
			H.-E.:	16.70	4.30
			M. O.:	8.09	2.08
			REC. :	55.90	14.49
			TOTAL:	251.88	65.36
C1000	COMPACTACION CON MAQUINARIA	M3	MAT. :	2.69	0.69
			H.-E.:	2.36	0.61
			M. O.:	0.52	0.14
			REC. :	1.93	0.51
			TOTAL:	7.50	1.95
C0102	COMPUERTA DE 0.35 X 0.35 PARA SUMIDEROS PROVISION Y COLOCACION	UN	MAT. :	90.56	23.40
			H.-E.:	0.00	0.00
			M. O.:	4.45	1.15
			REC. :	27.78	7.19
			TOTAL:	122.79	31.74

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
C0101	COMPUERTA DE ALUMINIO DE 0.50 X 0.50 MTS PARA SUMIDEROS	UN	MAT. :	103.65	26.77
			H.-E.:	0.00	0.00
			M. O.:	6.91	1.79
			REC. :	34.57	8.94
			TOTAL:	145.13	37.50
T2020	CONCRETO ASFALTICO DE 5 CMS.	M2	MAT. :	20.44	5.28
			H.-E.:	14.05	3.63
			M. O.:	1.27	0.33
			REC. :	9.93	2.57
			TOTAL:	45.69	11.81
CORO1	CORDON DE CONCRETO 15 x 50 cm	ML	MAT. :	12.86	3.32
			H.-E.:	0.00	0.00
			M. O.:	5.78	1.50
			REC. :	11.79	3.07
			TOTAL:	30.43	7.89
C0014	CORDON DE CONCRETO DE 20x30 CMS.	ML	MAT. :	11.12	2.88
			H.-E.:	0.00	0.00
			M. O.:	4.62	1.20
			REC. :	9.62	2.50
			TOTAL:	25.36	6.58
C0002	CORDON DE CONCRETO DE 15 CMS X 30 CMS	ML	MAT. :	9.30	2.40
			H.-E.:	0.00	0.00
			M. O.:	5.54	1.44
			REC. :	10.60	2.75
			TOTAL:	25.44	6.59
C0020	CORDON DE CONCRETO DE 15 CMS X 65 CMS PARA JARDINERA TIPO A	ML	MAT. :	31.30	8.07
			H.-E.:	0.00	0.00
			M. O.:	7.39	1.92
			REC. :	18.51	4.81
			TOTAL:	57.20	14.80
C0034	CORDON DE CONCRETO DE 15x30 CM (SOLO MANO DE OBRA)	ML	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	5.54	1.44
			REC. :	8.44	2.19
			TOTAL:	13.98	3.63
C0033	CORDON DE CONCRETO DE 15x30 CM (SOLO MATERIAL)	ML	MAT. :	9.30	2.40
			H.-E.:	0.00	0.00
			M. O.:	0.00	0.00
			REC. :	2.16	0.56
			TOTAL:	11.46	2.96

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
C0001	CORDON DE CONCRETO DE 20 CMS X 35 CMS	ML	MAT. :	12.27	3.17
			H.-E.:	0.00	0.00
			M. O.:	5.54	1.44
			REC. :	11.29	2.93
			TOTAL:	29.10	7.54
C0022	CORDON DE CONCRETO DE 20 x 30 CM (SEGUNDO ANALISIS)	ML	MAT. :	11.51	2.98
			H.-E.:	0.00	0.00
			M. O.:	4.25	1.11
			REC. :	9.14	2.39
			TOTAL:	24.90	6.48
C0031	CORDON DE CONCRETO DE 20x30 CM (SOLO MATERIAL)	ML	MAT. :	14.28	3.70
			H.-E.:	0.00	0.00
			M. O.:	0.00	0.00
			REC. :	3.31	0.85
			TOTAL:	17.59	4.55
C0032	CORDON DE CONCRETO DE 20x30 CM (SOLO MANO DE OBRA)	ML	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	5.54	1.44
			REC. :	8.44	2.19
			TOTAL:	13.98	3.63
C0036	CORDON PREFABRICADO DE CONCRE-TO 0.40 x 0.35 x 0.12 M 1:2:3 (KINGBLOCK - TOMAS)	ML	MAT. :	18.49	4.77
			H.-E.:	0.00	0.00
			M. O.:	1.99	0.51
			REC. :	7.33	1.89
			TOTAL:	27.81	7.17
T0038	CUBERTINA DE TEJA COLONIAL	ML	MAT. :	4.50	1.16
			H.-E.:	0.00	0.00
			M. O.:	3.08	0.80
			REC. :	5.73	1.49
			TOTAL:	13.31	3.45
C0004	CUBIERTA DE CALAMINA NRO. 28 INCLUYE MADERAMEN	M2	MAT. :	50.97	13.08
			H.-E.:	0.00	0.00
			M. O.:	13.20	3.43
			REC. :	31.93	8.25
			TOTAL:	96.10	24.76
C0025	CUBIERTA DE CALAMINA PLASTICA INCLUYE MADERAMEN	M2	MAT. :	71.51	18.41
			H.-E.:	0.00	0.00
			M. O.:	13.20	3.43
			REC. :	36.69	9.49
			TOTAL:	121.40	31.33

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
E0038	CUBIERTA DE TEJA TIPO COLONIAL	M2	MAT. :	30.53	7.85
			H.-E.:	0.00	0.00
			M. O.:	9.22	2.39
			REC. :	21.12	5.46
			TOTAL:	60.87	15.70
C0028	CUBIERTA PLACA ONDULADA DURALIT-CANALIT 91 CON ESTRUCTURA	M2	MAT. :	60.52	15.58
			H.-E.:	0.00	0.00
			M. O.:	9.99	2.59
			REC. :	29.26	7.56
			TOTAL:	99.77	25.73
A0010	CUNETA HORMIGONADA CON BASE DE PIEDRA,ANCHO=>0.7 M ESP.DE HORMIGON=4 CM. DOSIF.1:2:3	ML	MAT. :	8.22	2.12
			H.-E.:	0.00	0.00
			M. O.:	5.54	1.44
			REC. :	10.35	2.69
			TOTAL:	24.11	6.25
C0017	CUNETA HORMIGONADA ESP=20 CM B=40 CM INCL=60 CM TAL=1:1 ANCHO T.=1.7 M ALT.T.=0.65 M	ML	MAT. :	33.47	8.65
			H.-E.:	0.00	0.00
			M. O.:	4.53	1.18
			REC. :	14.67	3.81
			TOTAL:	52.67	13.64
C0009	CUNETA TRAPEZOIDE ZAMPEADA	M2	MAT. :	4.20	1.09
			H.-E.:	0.00	0.00
			M. O.:	5.54	1.44
			REC. :	9.06	2.35
			TOTAL:	18.80	4.88
C0035	CUNETA ZAMPEADA (ICA)	M2	MAT. :	15.09	3.90
			H.-E.:	0.00	0.00
			M. O.:	6.64	1.72
			REC. :	13.60	3.53
			TOTAL:	35.33	9.15
C0008	CUNETAS DE PIEDRA CON CARPETA DE 4 CM.	M2	MAT. :	16.19	4.18
			H.-E.:	0.00	0.00
			M. O.:	9.85	2.55
			REC. :	18.75	4.85
			TOTAL:	44.79	11.58
D0015	DEMOLICION DE CONCRETO DE 3 A 5 CM DE ESPESOR CON COMBO Y BARRETA	M2	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	1.80	0.47
			REC. :	2.74	0.72
			TOTAL:	4.54	1.19

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
R0030	DEMOLICION DE CONCRETO 13 A 18 cm DE ESPESOR	M2	MAT. :	0.00	0.00
			H.-E.:	17.65	4.56
			M. O.:	2.06	0.53
			REC. :	7.23	1.87
			TOTAL:	26.94	6.96
R0029	DEMOLICION DE CONCRETO DE 8 A 12 CM DE ESPESOR	M2	MAT. :	0.00	0.00
			H.-E.:	11.99	3.10
			M. O.:	1.41	0.36
			REC. :	4.94	1.27
			TOTAL:	18.34	4.73
R0027	DEMOLICION DE CORDON DE ACERA	ML	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	0.84	0.22
			REC. :	1.28	0.33
			TOTAL:	2.12	0.55
D0013	DEMOLICION DE CUBIERTA DE CALAMINA	M2	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	5.37	1.39
			REC. :	8.18	2.12
			TOTAL:	13.55	3.51
D0011	DEMOLICION DE HORMIGON ARMADO	M3	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	18.00	4.66
			REC. :	27.41	7.09
			TOTAL:	45.41	11.75
D0008	DEMOLICION DE MAMPOSTERIA DENTRO DE GALERIAS	M3	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	13.32	3.45
			REC. :	20.29	5.25
			TOTAL:	33.61	8.70
R0028	DEMOLICION DE PAVIMENTO DE 5 A 7 CM DE ESPESOR	M2	MAT. :	0.00	0.00
			H.-E.:	7.82	2.02
			M. O.:	0.94	0.24
			REC. :	3.25	0.83
			TOTAL:	12.01	3.09
D0014	DEMOLICION DE PISO DE MACHIHEMBRE	M2	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	3.68	0.96
			REC. :	5.59	1.47
			TOTAL:	9.27	2.43

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
D0016	DEMOLICION DE REVOQUE DE CAL-CEMENTO-ARENA	M2	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	0.75	0.19
			REC. :	1.14	0.29
			TOTAL:	1.89	0.48
DEM01	DEMOLICION LADRILLO Y ADOBE	M3	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	6.00	1.55
			REC. :	9.14	2.37
			TOTAL:	15.14	3.92
D0021	DEMOLICION MURO DE TABIQUE DE 18 CMS. DE ESPESOR	M2	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	0.90	0.23
			REC. :	1.38	0.35
			TOTAL:	2.28	0.58
D0003	DEMOLICION MURO DE MAMPOSTERIA DE PIEDRA	M3	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	11.10	2.87
			REC. :	16.91	4.36
			TOTAL:	28.01	7.23
D0005	DESATE DE GAVIONES	M3	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	3.75	0.97
			REC. :	5.71	1.48
			TOTAL:	9.46	2.45
D0002	DESATE MURO DE ADOBES	M3	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	1.50	0.39
			REC. :	2.30	0.60
			TOTAL:	3.80	0.99
D0006	DESEMPIEDRE	M2	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	0.60	0.16
			REC. :	0.92	0.25
			TOTAL:	1.52	0.41
D0001	DESVIO TIPO A DE MADERA PARA RIOS PRINCIPALES 3 USOS	ML	MAT. :	39.45	10.19
			H.-E.:	0.00	0.00
			M. O.:	18.14	4.71
			REC. :	36.77	9.54
			TOTAL:	94.36	24.44

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
D0004	DESVIO TIPO B CON CALAMINA 5 USOS	ML	MAT. : H.-E.: M. O.: REC. : TOTAL:	6.08 0.00 4.62 8.44 19.14	1.56 0.00 1.20 2.19 4.95
D0007	DESVIO TIPO C	ML	MAT. : H.-E.: M. O.: REC. : TOTAL:	0.00 0.00 2.74 4.17 6.91	0.00 0.00 0.71 1.09 1.80
D0012	DESVIOS TIPO A FABRICADOS EN MADERA PARA RIOS SECUNDARIOS 4 USOS	ML	MAT. : H.-E.: M. O.: REC. : TOTAL:	25.00 0.00 18.14 33.42 76.56	6.46 0.00 4.71 8.67 19.84
D0010	DINTEL DE LADRILLO DE 6 H ARMADO	ML	MAT. : H.-E.: M. O.: REC. : TOTAL:	8.35 0.00 4.62 8.98 21.95	2.15 0.00 1.20 2.33 5.68
D0009	DINTELES DE 20 x 30 CON 4 VARILLAS DE 3/8" Y ANILLOS DE 1/4 PULG. C/20 CM.	ML	MAT. : H.-E.: M. O.: REC. : TOTAL:	29.61 0.00 13.86 27.98 71.45	7.61 0.00 3.59 7.24 18.44
E0018	ELEVACION DE CAMARAS	PZA	MAT. : H.-E.: M. O.: REC. : TOTAL:	7.23 0.00 2.76 5.88 15.87	1.86 0.00 0.72 1.53 4.11
E0030	EMBOQUILLADO CON OCRE	M2	MAT. : H.-E.: M. O.: REC. : TOTAL:	11.04 0.00 4.77 9.83 25.64	2.85 0.00 1.24 2.55 6.64
E0029	EMBOQUILLADO DE CEMENTO BLANCO	M2	MAT. : H.-E.: M. O.: REC. : TOTAL:	23.30 0.00 4.62 12.44 40.36	6.15 0.00 1.20 3.25 10.60

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
E0008	EMBOQUILLADO DE CEMENTO MORTERO 1:3	M2	MAT. :	5.10	1.32
			H.-E.:	0.00	0.00
			M. O.:	4.62	1.20
			REC. :	8.22	2.13
			TOTAL:	17.94	4.65
E0010	EMBOQUILLADO DENTRO DE GALERIAS	M2	MAT. :	4.36	1.12
			H.-E.:	0.00	0.00
			M. O.:	5.54	1.44
			REC. :	9.46	2.46
			TOTAL:	19.36	5.02
E0001	EMPIEDRE DE CALZADA	M2	MAT. :	4.20	1.09
			H.-E.:	0.00	0.00
			M. O.:	3.55	0.92
			REC. :	6.39	1.66
			TOTAL:	14.14	3.67
E0101	EMPIEDRE DE CALZADA (SIN MATERIAL)	M2	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	3.55	0.92
			REC. :	5.40	1.41
			TOTAL:	8.95	2.33
E0103	EMPIEDRE DE CALZADA CON CARPETA DE CONCRETO DE 4 CMS.	M2	MAT. :	12.72	3.30
			H.-E.:	0.00	0.00
			M. O.:	9.39	2.43
			REC. :	17.25	4.46
			TOTAL:	39.36	10.19
E0002	ENLOSETADO LOSETA ONDULADA	M2	MAT. :	31.58	8.17
			H.-E.:	0.00	0.00
			M. O.:	2.69	0.70
			REC. :	11.41	2.97
			TOTAL:	45.68	11.84
E0015	ENLOSETADO CON LOSETA HEXAGONAL DE 7 CM (KINGBLOCK - TOMAS)	M2	MAT. :	24.65	6.37
			H.-E.:	0.00	0.00
			M. O.:	1.85	0.48
			REC. :	8.54	2.20
			TOTAL:	35.04	9.05
P0028	ENLOSETADO DE LOSETA HEXAGONAL	M2	MAT. :	28.21	7.28
			H.-E.:	0.00	0.00
			M. O.:	2.69	0.70
			REC. :	10.64	2.77
			TOTAL:	41.54	10.75

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
E0104	ENLOSETADO DE PIEDRA GRANCEADA 30x40 CM.	M2	MAT. :	87.09	22.55
			H.-E.:	0.00	0.00
			M. O.:	13.86	3.59
			REC. :	41.31	10.70
			TOTAL:	142.26	36.84
Z0001	ENLOSETADO SIN PROVISION	M2	MAT. :	3.25	0.84
			H.-E.:	0.00	0.00
			M. O.:	2.69	0.70
			REC. :	4.84	1.27
			TOTAL:	10.78	2.81
E0021	ENLUCIDO CON CEMENTO ESP: 0.5 CM. 1:3	M2	MAT. :	1.42	0.37
			H.-E.:	0.00	0.00
			M. O.:	4.62	1.20
			REC. :	7.37	1.92
			TOTAL:	13.41	3.49
E0905	ENLUCIDO CON CEMENTO BLANCO	M2	MAT. :	12.74	3.36
			H.-E.:	0.00	0.00
			M. O.:	4.77	1.24
			REC. :	10.22	2.67
			TOTAL:	27.73	7.27
E0904	ENLUCIDO CON OCRE E=1.00 CM	M2	MAT. :	7.09	1.83
			H.-E.:	0.00	0.00
			M. O.:	4.77	1.24
			REC. :	8.91	2.31
			TOTAL:	20.77	5.38
E0014	ENLUCIDO DE CEMENTO PARA CANALES (INCLUYE EMBOQUILLADO) DE 3 CM 1:3	M2	MAT. :	7.11	1.84
			H.-E.:	0.00	0.00
			M. O.:	4.33	1.12
			REC. :	8.25	2.14
			TOTAL:	19.69	5.10
E0020	ENTIBADO Y APUNTALADO	M2	MAT. :	7.90	2.04
			H.-E.:	0.00	0.00
			M. O.:	11.55	3.00
			REC. :	19.42	5.04
			TOTAL:	38.87	10.08
E0044	ENTIBADO Y APUNTALADO DENTRO DE GALERIAS	M2	MAT. :	14.50	3.76
			H.-E.:	0.00	0.00
			M. O.:	13.86	3.59
			REC. :	24.47	6.33
			TOTAL:	52.83	13.68

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
E0042	ESCALERAS CON PELDANOS DE 25CM DE ANCHO x 2 PULG. DE ESPESOR (MADERA MARA)	M2	MAT. :	92.85	24.12
			H.-E.:	0.00	0.00
			M. O.:	20.81	5.36
			REC. :	53.23	13.76
			TOTAL:	166.89	43.24
E0031	ESCOBILLADO CON CEMENTO	M2	MAT. :	5.50	1.42
			H.-E.:	0.00	0.00
			M. O.:	4.62	1.20
			REC. :	8.32	2.17
			TOTAL:	18.44	4.79
E0013	ESPEJOS PROVISION Y COLOCACION	M2	MAT. :	85.50	21.99
			H.-E.:	0.00	0.00
			M. O.:	2.35	0.60
			REC. :	23.42	6.02
			TOTAL:	111.27	28.61
E0026	ESTRIBOS DE 5/8" PARA INSPECCION	PZA	MAT. :	8.23	2.12
			H.-E.:	0.00	0.00
			M. O.:	3.06	0.80
			REC. :	6.56	1.71
			TOTAL:	17.85	4.63
E0006	ESTRUCTURA METALICA DE PERFIL L,T DE 1 1/2"	ML	MAT. :	8.90	2.30
			H.-E.:	0.00	0.00
			M. O.:	2.70	0.70
			REC. :	6.18	1.61
			TOTAL:	17.78	4.61
E0007	EXCAVACION 0 - 2 MTS CON AGOTAMIENTO.	M3	MAT. :	0.00	0.00
			H.-E.:	4.88	1.26
			M. O.:	7.50	1.94
			REC. :	12.56	3.26
			TOTAL:	24.94	6.46
E0023	EXCAVACION 2 - 4 MTS C/AGOT.	M3	MAT. :	0.00	0.00
			H.-E.:	9.75	2.52
			M. O.:	11.40	2.95
			REC. :	19.62	5.08
			TOTAL:	40.77	10.55
E0025	EXCAVACION A MAS DE 6 M CON AGOTAMIENTO	M3	MAT. :	0.00	0.00
			H.-E.:	19.50	5.03
			M. O.:	17.40	4.50
			REC. :	31.03	8.03
			TOTAL:	67.93	17.56

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
E0017	EXCAVACION CON MAQUINA DTL = 2000 m INCLUYE ENTIBADO	M3	MAT. : H.-E.: M. O.: REC. : TOTAL:	7.90 9.94 11.55 21.73 51.12	2.04 2.58 3.00 5.64 13.26
E1000	EXCAVACION CON RETROEXCAVADORA CASE DE 1 M3 DE CAPACIDAD	M3	MAT. : H.-E.: M. O.: REC. : TOTAL:	0.00 3.20 0.09 0.88 4.17	0.00 0.83 0.02 0.22 1.07
E0016	EXCAVACION DE 0 A 1 MTS C/AGOT	M3	MAT. : H.-E.: M. O.: REC. : TOTAL:	0.00 1.95 4.50 7.31 13.76	0.00 0.50 1.16 1.89 3.55
E0012	EXCAVACION DE 0 A 1 MTS S/AGOT	M3	MAT. : H.-E.: M. O.: REC. : TOTAL:	0.00 0.00 3.75 5.71 9.46	0.00 0.00 0.97 1.48 2.45
E0005	EXCAVACION DE 0 A 2 M S/AGOT (SEGUNDO ANALISIS)	M3	MAT. : H.-E.: M. O.: REC. : TOTAL:	0.00 0.00 6.75 10.28 17.03	0.00 0.00 1.75 2.67 4.42
E0028	EXCAVACION DE 0 A 2 MTS S/AGOT	M3	MAT. : H.-E.: M. O.: REC. : TOTAL:	0.00 0.00 6.00 9.14 15.14	0.00 0.00 1.55 2.37 3.92
C0016	EXCAVACION DE 0-2 M. DENTRO DE GALERIAS S/AGOT	M3	MAT. : H.-E.: M. O.: REC. : TOTAL:	0.00 0.00 10.98 16.72 27.70	0.00 0.00 2.84 4.32 7.16
E0011	EXCAVACION DE 0-2 METROS DENTRO DE GALERIAS CON AGOTAMIENTO	M3	MAT. : H.-E.: M. O.: REC. : TOTAL:	0.00 4.88 15.00 23.97 43.85	0.00 1.26 3.88 6.19 11.33

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
E0003	EXCAVACION DE 2 A 4 MTS S/AGOT	M3	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	9.00	2.33
			REC. :	13.70	3.54
			TOTAL:	22.70	5.87
E0024	EXCAVACION DE 4 A 6 MTS CON AGOTAMIENTO	M3	MAT. :	0.00	0.00
			H.-E.:	14.63	3.77
			M. O.:	13.65	3.53
			REC. :	24.18	6.25
			TOTAL:	52.46	13.55
E0004	EXCAVACION DE 4 A 6 MTS. S/AGOT	M3	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	12.00	3.10
			REC. :	18.27	4.72
			TOTAL:	30.27	7.82
FAS11	FABRICACION DE SILLAR TIPO A	PZA	MAT. :	0.00	0.00
			H.-E.:	6.97	1.80
			M. O.:	9.24	2.40
			REC. :	15.69	4.07
			TOTAL:	31.90	8.27
F0038	FALLEBAS (OCUPADO - LIBRE)	PZA	MAT. :	12.10	3.13
			H.-E.:	0.00	0.00
			M. O.:	1.38	0.36
			REC. :	4.91	1.27
			TOTAL:	18.39	4.76
F0028	FROTACHADO CON CEMENTO ESPESOR 1 CM MORTERO 1:3	M2	MAT. :	2.50	0.64
			H.-E.:	0.00	0.00
			M. O.:	4.63	1.20
			REC. :	7.63	1.98
			TOTAL:	14.76	3.82
C0003	GUARDA POLVO DE MADERA MARA DE 3	ML	MAT. :	4.83	1.24
			H.-E.:	0.00	0.00
			M. O.:	1.39	0.35
			REC. :	3.24	0.83
			TOTAL:	9.46	2.42
H0001	HORMIGON ARMADO	M3	MAT. :	547.05	141.28
			H.-E.:	0.00	0.00
			M. O.:	83.92	21.77
			REC. :	254.70	65.93
			TOTAL:	885.67	228.98

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
H0002	HORMIGON CICLOPEO CON 30 % DE PIEDRA DESPLAZADORA	M3	MAT. :	207.20	53.50
			H.-E.:	0.00	0.00
			M. O.:	26.12	6.77
			REC. :	87.84	22.71
			TOTAL:	321.16	82.98
H0025	HORMIGON CICLOPEO CON 50 % DE PIEDRA DESPLAZADORA	M3	MAT. :	148.10	38.25
			H.-E.:	0.00	0.00
			M. O.:	23.10	5.99
			REC. :	69.54	18.00
			TOTAL:	240.74	62.24
H0042	HORMIGON PARA BOVEDA	M3	MAT. :	230.08	59.42
			H.-E.:	17.02	4.40
			M. O.:	78.92	20.47
			REC. :	177.48	45.97
			TOTAL:	503.50	130.26
H0142	HORMIGON PARA BOVEDA DENTRO DE GALERIAS	M3	MAT. :	298.08	76.98
			H.-E.:	17.02	4.40
			M. O.:	108.40	28.11
			REC. :	238.15	61.68
			TOTAL:	661.65	171.17
H0041	HORMIGON PARA CIMENTACIONES	M3	MAT. :	192.50	49.70
			H.-E.:	17.02	4.40
			M. O.:	73.92	19.17
			REC. :	161.17	41.74
			TOTAL:	444.61	115.01
H0009	HORMIGON PARA LOSA DE CUBIERTA (SEGUNDO ANALISIS)	M3	MAT. :	292.30	75.48
			H.-E.:	25.53	6.60
			M. O.:	49.54	12.83
			REC. :	149.17	38.58
			TOTAL:	516.54	133.49
H0044	HORMIGON PARA LOSAS	M3	MAT. :	321.78	83.09
			H.-E.:	17.02	4.40
			M. O.:	83.92	21.77
			REC. :	206.38	53.45
			TOTAL:	629.10	162.71
H0011	HORMIGON PARA MUROS (SEGUNDO ANALISIS)	M3	MAT. :	309.30	79.87
			H.-E.:	25.53	6.60
			M. O.:	49.54	12.83
			REC. :	153.11	39.60
			TOTAL:	537.48	138.90

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
H0012	HORMIGON POBRE (SEGUNDO ANALISIS)	M3	MAT. :	137.30	35.45
			H.-E.:	11.61	3.00
			M. O.:	44.04	11.40
			REC. :	101.60	26.27
			TOTAL:	294.55	76.12
H0013	HORMIGON SIMPLE 210 KP/CM2 PARA CAJONES PREFABRICADOS (INCLUYE LANZAMIENTO)	M3	MAT. :	302.50	78.11
			H.-E.:	17.02	4.40
			M. O.:	102.78	26.66
			REC. :	230.62	59.72
			TOTAL:	652.92	168.89
H0043	HORMIGON SIMPLE DE FC=210KG/CM2	M3	MAT. :	302.50	78.11
			H.-E.:	17.02	4.40
			M. O.:	83.92	21.77
			REC. :	201.90	52.29
			TOTAL:	605.34	156.57
H0045	HORMIGON SIMPLE DE FC=120 KG/CM2	M3	MAT. :	140.10	36.18
			H.-E.:	7.74	2.00
			M. O.:	58.44	15.15
			REC. :	123.27	31.92
			TOTAL:	329.55	85.25
H0005	HORMIGON SIMPLE DE FC=120 KG/CM2 (SOLO MATERIAL)	M3	MAT. :	246.60	63.68
			H.-E.:	17.02	4.40
			M. O.:	0.00	0.00
			REC. :	61.16	15.80
			TOTAL:	324.78	83.88
H0006	HORMIGON SIMPLE FC=120 KG/CM2 (SOLO MANO DE OBRA)	M3	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	45.96	11.91
			REC. :	69.98	18.14
			TOTAL:	115.94	30.05
H0008	HORMIGON SIMPLE FC=210 KG/CM2 (SOLO MANO DE OBRA)	M3	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	45.96	11.91
			REC. :	69.98	18.14
			TOTAL:	115.94	30.05
H0007	HORMIGON SIMPLE FC=210 KG/CM2 (SOLO MATERIAL)	M3	MAT. :	302.50	78.11
			H.-E.:	17.02	4.40
			M. O.:	0.00	0.00
			REC. :	74.13	19.14
			TOTAL:	393.65	101.65

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
H0010	HORMOGON PARA LOSA DE FONDO (SEGUNDO ANALISIS)	M3	MAT. :	292.30	75.48
			H.-E.:	25.53	6.60
			M. O.:	49.54	12.83
			REC. :	149.17	38.58
			TOTAL:	516.54	133.49
00010	HOYADURAS PARA FORESTACION	HOYO	MAT. :	0.92	0.24
			H.-E.:	0.00	0.00
			M. O.:	0.90	0.23
			REC. :	1.59	0.41
			TOTAL:	3.41	0.88
I0021	IMPERMEABILIZACION TECHO CON ASFALTO H = 0.03 MTS.	M2	MAT. :	3.90	0.99
			H.-E.:	0.00	0.00
			M. O.:	4.62	1.20
			REC. :	7.94	2.06
			TOTAL:	16.46	4.25
S0003	IMPERMEABILIZACION SIKANORM O SIMILAR	M2	MAT. :	49.12	12.65
			H.-E.:	0.00	0.00
			M. O.:	9.99	2.59
			REC. :	26.61	6.87
			TOTAL:	85.72	22.11
I0006	IMPERMEABILIZANTE CON MANTA DE PVC	M2	MAT. :	32.25	8.33
			H.-E.:	0.00	0.00
			M. O.:	0.92	0.24
			REC. :	8.89	2.30
			TOTAL:	42.06	10.87
I1001	IMPRIMACION ASFALTICA	M2	MAT. :	0.00	0.00
			H.-E.:	0.16	0.04
			M. O.:	0.00	0.00
			REC. :	0.04	0.00
			TOTAL:	0.20	0.04
I0007	IMPRIMACION BITUMINOSA	M2	MAT. :	1.14	0.29
			H.-E.:	0.46	0.12
			M. O.:	0.21	0.05
			REC. :	0.69	0.17
			TOTAL:	2.50	0.63
I0000	INSTALACION DE FAENAS Y LIMPIEZA	GL	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	45.69	11.80
			REC. :	69.57	17.97
			TOTAL:	115.26	29.77

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
I0123	INSTALACION ELECTRICA PUNTOS DE TOMA CORRIENTE	PTO	MAT. :	29.64	7.46
			H.-E.:	0.00	0.00
			M. O.:	12.93	3.33
			REC. :	26.57	6.80
			TOTAL:	69.14	17.59
I0008	INSTALACION ELECTRICA ZANJON INSTITUTO AMERICANO	GL	MAT. :	258,186.79	66,701.04
			H.-E.:	0.00	0.00
			M. O.:	0.00	0.00
			REC. :	59,899.33	15,474.64
			TOTAL:	318,086.12	82,175.68
I0124	INSTALACION ELECTRICA PUNTOS DE LUMINARIA	PTO.	MAT. :	29.75	7.52
			H.-E.:	0.00	0.00
			M. O.:	12.93	3.33
			REC. :	26.60	6.82
			TOTAL:	69.28	17.67
I0003	INSTALACION SANITARIA URINARIO ESQUINERO	PZA	MAT. :	126.35	32.63
			H.-E.:	0.00	0.00
			M. O.:	43.53	11.23
			REC. :	95.59	24.66
			TOTAL:	265.47	68.52
I0004	INSTALACION SANITARIA URINARIO POR METRO LINEAL	ML	MAT. :	26.28	6.79
			H.-E.:	0.00	0.00
			M. O.:	28.51	7.36
			REC. :	49.51	12.78
			TOTAL:	104.30	26.93
I0005	INSTALACION SANITARIA LAVANDERIA DE Ho.Ao.	PZA	MAT. :	105.35	27.42
			H.-E.:	0.00	0.00
			M. O.:	33.52	8.65
			REC. :	75.49	19.54
			TOTAL:	214.36	55.61
I0121	INSTALACION SANITARIA LAVAMANOS	UN.	MAT. :	317.10	81.84
			H.-E.:	0.00	0.00
			M. O.:	33.52	8.65
			REC. :	124.61	32.16
			TOTAL:	475.23	122.65
I0122	INSTALACION SANITARIA INODORO	UN.	MAT. :	153.15	39.57
			H.-E.:	0.00	0.00
			M. O.:	43.53	11.23
			REC. :	101.81	26.28
			TOTAL:	298.49	77.08

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
I0001	INSTALACION SANITARIA POR PUNTO.(MANO DE OBRA)	PTO	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	23.77	6.12
			REC. :	36.19	9.31
			TOTAL:	59.96	15.43
I0002	INSTALACION SANITARIA INODORO TURCO	PZA	MAT. :	99.35	25.69
			H.-E.:	0.00	0.00
			M. O.:	33.52	8.65
			REC. :	74.10	19.13
			TOTAL:	206.97	53.47
I0120	INSTALACION SANITARIA DUCHA	PZA	MAT. :	331.90	85.77
			H.-E.:	0.00	0.00
			M. O.:	32.71	8.45
			REC. :	126.82	32.76
			TOTAL:	491.43	126.98
00007	ITEM PARA EL CALCULO DE PRECIOS GLOBALES	GLOB	MAT. :	1.35	0.35
			H.-E.:	0.00	0.00
			M. O.:	0.00	0.00
			REC. :	0.31	0.08
			TOTAL:	1.66	0.43
J0001	JAMBAS	ML	MAT. :	2.58	0.66
			H.-E.:	0.00	0.00
			M. O.:	4.93	1.28
			REC. :	8.11	2.10
			TOTAL:	15.62	4.04
J0003	JUNTAS DE DILATACION ELASTOMERICA	ML	MAT. :	42.63	11.03
			H.-E.:	0.00	0.00
			M. O.:	0.38	0.10
			REC. :	10.47	2.72
			TOTAL:	53.48	13.85
J0002	JUNTAS DE DILATACION	ML	MAT. :	1.62	0.42
			H.-E.:	0.00	0.00
			M. O.:	0.70	0.18
			REC. :	1.45	0.37
			TOTAL:	3.77	0.97
L0001	LETRERO DE SENALIZACION VERTICAL,FABRICADO Y COLOCADO	PZA	MAT. :	109.31	28.13
			H.-E.:	0.00	0.00
			M. O.:	9.51	2.45
			REC. :	35.66	9.17
			TOTAL:	154.48	39.75

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
L0007	LETRERO DE SENALIZACION DE MADERA	PZA	MAT. :	71.61	18.51
			H.-E.:	53.36	13.75
			M. O.:	69.38	17.85
			REC. :	99.63	25.66
			TOTAL:	293.98	75.77
L0002	LETRERO DE SENALIZACION VERTICAL,COLOCADO SIN MATERIAL INC/TRANSPORTE	PZA	MAT. :	5.87	1.51
			H.-E.:	0.00	0.00
			M. O.:	2.38	0.61
			REC. :	5.91	1.51
			TOTAL:	14.16	3.63
L0060	LETRERO METALICO DE INDICACION DE RUTA PARA MINIBUSES	PZA	MAT. :	18.65	4.83
			H.-E.:	0.00	0.00
			M. O.:	10.38	2.68
			REC. :	21.47	5.54
			TOTAL:	50.50	13.05
L0003	LIMPIEZA DE RIOS CANALIZADOS CERRADOS	M3	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	12.00	3.10
			REC. :	18.27	4.72
			TOTAL:	30.27	7.82
L0005	LIMPIEZA DE RIOS CANALIZADOS	M3	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	9.00	2.33
			REC. :	13.70	3.54
			TOTAL:	22.70	5.87
L0004	LIMPIEZA DE SUMIDEROS C/TRANSPORTE A MAS DE 1.000 M.	UN	MAT. :	0.00	0.00
			H.-E.:	11.61	3.00
			M. O.:	3.00	0.78
			REC. :	7.26	1.89
			TOTAL:	21.87	5.67
00020	LISTONES DE ROLLIZOS DE 2"	ML	MAT. :	1.62	0.41
			H.-E.:	0.00	0.00
			M. O.:	0.83	0.21
			REC. :	1.64	0.41
			TOTAL:	4.09	1.03
LL001	LLAVE DE PASO DE 1/2" PROVISION Y COLOCACION	PZA	MAT. :	15.00	3.88
			H.-E.:	0.00	0.00
			M. O.:	7.20	1.86
			REC. :	14.44	3.73
			TOTAL:	36.64	9.47

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	.UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
L0021	LUMINARIA FLUORECENTE CON DIFUSOR DE 20 W. x 2 TUBOS (COLOCACION Y PROVISION)	PZA	MAT. :	104.68	27.01
			H.-E.:	0.00	0.00
			M. O.:	17.63	4.54
			REC. :	51.13	13.19
			TOTAL:	173.44	44.74
L0022	LUMINARIA INCANDESCENTE DE 100 WATS (COLOCACION Y PROVISION)	PZA	MAT. :	31.28	7.92
			H.-E.:	0.00	0.00
			M. O.:	12.93	3.33
			REC. :	26.95	6.91
			TOTAL:	71.16	18.16
M0016	MACHONES DE LADRILLO 6 H. 0.25 x 0.25 MORTERO 1:5	ML	MAT. :	7.62	1.98
			H.-E.:	0.00	0.00
			M. O.:	3.93	1.02
			REC. :	7.76	2.02
			TOTAL:	19.31	5.02
M0007	MACIZOS FLORALES COLOCACION Y PROVISION	M2	MAT. :	361.00	92.93
			H.-E.:	0.00	0.00
			M. O.:	1.50	0.39
			REC. :	86.05	22.16
			TOTAL:	448.55	115.48
00017	MADERA PARA JUNTAS EN PISO DE CEMENTO POR METRO CUADRADO DE PISO INCLUYE CLAVOS	M2	MAT. :	9.04	2.33
			H.-E.:	0.00	0.00
			M. O.:	1.62	0.42
			REC. :	4.56	1.18
			TOTAL:	15.22	3.93
T0128	MALLA GALVANIZADA DE TRIPLE TORSION, SOLO TENDIDO	M2	MAT. :	0.60	0.16
			H.-E.:	0.00	0.00
			M. O.:	0.83	0.22
			REC. :	1.41	0.37
			TOTAL:	2.84	0.75
T0008	MALLA OLIMPICA REPOSICION SIN PROVISION	M2	MAT. :	4.85	1.25
			H.-E.:	0.00	0.00
			M. O.:	2.45	0.64
			REC. :	4.84	1.27
			TOTAL:	12.14	3.16
R0005	MALLA OLIMPICA REPOSICION CON PROVISION DE MALLA (NO INCLUYE TUBOS)	M2	MAT. :	20.40	5.26
			H.-E.:	0.00	0.00
			M. O.:	3.64	0.94
			REC. :	10.27	2.66
			TOTAL:	34.31	8.86

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
M0020	MALLA OLIMPICA COL. Y PROV. MAS TUBOS DE FG DE 2" CADA 2.5 M.	M2	MAT. :	37.69	9.71
			H.-E.:	0.00	0.00
			M. O.:	5.00	1.29
			REC. :	16.36	4.21
			TOTAL:	59.05	15.21
M0058	MAMPARAS DE MADERA MARA SIN VIDRIO	M2	MAT. :	77.97	20.26
			H.-E.:	0.00	0.00
			M. O.:	37.00	9.52
			REC. :	74.43	19.20
			TOTAL:	189.40	48.98
M0004	MAMPOSTERIA DE PIEDRA BRUTA TIPO B MORTERO 1:4	M3	MAT. :	79.35	20.50
			H.-E.:	0.00	0.00
			M. O.:	27.72	7.19
			REC. :	60.61	15.71
			TOTAL:	167.68	43.40
M0002	MAMPOSTERIA DE PIEDRA CORTADA TIPO A MORTERO 1:4	M3	MAT. :	122.00	31.54
			H.-E.:	0.00	0.00
			M. O.:	36.46	9.46
			REC. :	83.82	21.72
			TOTAL:	242.28	62.72
M0033	MAMPOSTERIA TIPO "B" PIEDRA VISTA	M3	MAT. :	79.00	20.41
			H.-E.:	0.00	0.00
			M. O.:	30.03	7.79
			REC. :	64.06	16.59
			TOTAL:	173.09	44.79
M0001	MAMPOSTERIA TIPO A MORTERO 1:5	M3	MAT. :	115.55	29.87
			H.-E.:	0.00	0.00
			M. O.:	36.46	9.46
			REC. :	82.31	21.34
			TOTAL:	234.32	60.67
M0010	MAMPOSTERIA TIPO A 1:4 (REPARACION INTERIOR BOVEDAS)	M3	MAT. :	128.07	33.09
			H.-E.:	0.00	0.00
			M. O.:	47.82	12.40
			REC. :	102.52	26.56
			TOTAL:	278.41	72.05
M0003	MAMPOSTERIA TIPO B MORTERO 1:5	M3	MAT. :	72.90	18.83
			H.-E.:	0.00	0.00
			M. O.:	27.72	7.19
			REC. :	59.97	15.54
			TOTAL:	160.59	41.56

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
M0019	MAMPOSTERIA TIPO B MORTERO 1:5 SIN PIEDRA	M3	MAT. : H.-E.: M. O.: REC. : TOTAL:	53.18 0.00 28.62 55.91 137.71	13.73 0.00 7.42 14.48 35.63
00014	MAMPOSTERIA TIPO B 1:4 (REPARACION INTERIOR BOVEDAS)	M3	MAT. : H.-E.: M. O.: REC. : TOTAL:	85.42 0.00 38.46 78.37 202.25	22.05 0.00 9.97 20.31 52.33
M0103	MAMPOSTERIA TIPO B EN GALERIAS FILTRANTES MORTERO 1:5	M3	MAT. : H.-E.: M. O.: REC. : TOTAL:	76.85 0.00 43.08 83.42 203.35	19.85 0.00 11.17 21.62 52.64
M0031	MAMPOSTERIA TIPO B PIEDRA VISTA EMBOQUILLADO Y FROTACHADO MORTERO 1:5	M3	MAT. : H.-E.: M. O.: REC. : TOTAL:	101.52 0.00 35.69 77.88 215.09	26.23 0.00 9.25 20.17 55.65
A0022	MEMBRANA PLASTICA O DE P.V.C. DE 0.5 MM DE ESPESOR PROVISION Y COLOCACION	M2	MAT. : H.-E.: M. O.: REC. : TOTAL:	32.02 0.00 0.31 7.91 40.24	8.27 0.00 0.08 2.03 10.38
M0011	MORTERO DE CEMENTO Y ARENA 1:3 (SOLO PREPARADO)	M3	MAT. : H.-E.: M. O.: REC. : TOTAL:	247.60 0.00 1.50 59.74 308.84	63.93 0.00 0.39 15.43 79.75
M0012	MORTERO DE CEMENTO Y ARENA 1:4 (SOLO PREPARADO)	M3	MAT. : H.-E.: M. O.: REC. : TOTAL:	208.90 0.00 1.50 50.76 261.16	53.94 0.00 0.39 13.11 67.44
M0013	MORTERO DE CEMENTO Y ARENA 1:6 (SOLO PREPARADO)	M3	MAT. : H.-E.: M. O.: REC. : TOTAL:	169.34 0.00 1.50 41.58 212.42	43.73 0.00 0.39 10.74 54.86

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
M0014	MORTERO DE CEMENTO Y ARENA 1:2 (SOLO PREPARADO)	M3	MAT. :	318.12	82.13
			H.-E.:	0.00	0.00
			M. O.:	1.50	0.39
			REC. :	76.09	19.65
			TOTAL:	395.71	102.17
R0001	MORTERO DE CEMENTO Y ARENA 1:5 (SOLO PREPARADO)	M3	MAT. :	171.80	44.36
			H.-E.:	0.00	0.00
			M. O.:	4.06	1.05
			REC. :	46.03	11.89
			TOTAL:	221.89	57.30
I0090	MORTERO IMPERMEABILIZANTE PARA TANQUES DE AGUA Y/O SUP.SIMILARES (SIKA I) E=2 CM.	M2	MAT. :	8.71	2.25
			H.-E.:	0.00	0.00
			M. O.:	6.15	1.60
			REC. :	11.39	2.96
			TOTAL:	26.25	6.81
M0017	MOVIMIENTO DE TIERRA CON EQUIPO PESADO (CORTE Y SELECCION)	M3	MAT. :	0.00	0.00
			H.-E.:	3.63	0.94
			M. O.:	0.00	0.00
			REC. :	0.85	0.22
			TOTAL:	4.48	1.16
M0005	MURO DE ADOBE E=0.20 MTS DIMENSIONES .10 X .20 X .40	M2	MAT. :	5.00	1.75
			H.-E.:	0.00	0.00
			M. O.:	6.14	1.59
			REC. :	10.51	2.83
			TOTAL:	21.65	6.17
M0600	MURO DE BLOQUES DE HORMIGON DIM(0.15x0.4x0.1)M	M2	MAT. :	57.82	14.87
			H.-E.:	0.00	0.00
			M. O.:	8.60	2.23
			REC. :	26.51	6.84
			TOTAL:	92.93	23.94
M0006	MURO DE LADRILLO DE 6 HUECOS E=0.18MTS	M2	MAT. :	16.52	4.28
			H.-E.:	0.00	0.00
			M. O.:	8.60	2.23
			REC. :	16.93	4.38
			TOTAL:	42.05	10.89
M0009	MURO DE LADRILLO DE 6 HUECOS E=0.12	M2	MAT. :	10.91	2.83
			H.-E.:	0.00	0.00
			M. O.:	7.68	2.00
			REC. :	14.22	3.71
			TOTAL:	32.81	8.54

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
M0015	MURO DE LADRILLO GAMBOTE	M2	MAT. :	20.63	5.34
	DE 0.12 ESPESOR		H.-E.:	0.00	0.00
	MORTERO 1:5		M. O.:	10.46	2.71
			REC. :	20.70	5.37
			TOTAL:	51.79	13.42
M0008	MURO DE LADRILLO REPRENSADO	M2	MAT. :	18.46	4.65
	e=0.06 M.		H.-E.:	0.00	0.00
			M. O.:	7.09	1.84
			REC. :	15.07	3.88
			TOTAL:	40.62	10.37
M0032	MURO DE PEDRONES	M3	MAT. :	0.00	0.00
	NO INCLUYE MATERIAL		H.-E.:	0.00	0.00
			M. O.:	13.86	3.59
			REC. :	21.11	5.46
			TOTAL:	34.97	9.05
N0001	NIVELACION TERRENO	M3	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	3.75	0.97
			REC. :	5.71	1.48
			TOTAL:	9.46	2.45
P0080	PASAMANOS DE 5/8"	ML	MAT. :	10.88	2.80
	PARA CANALIZACION		H.-E.:	0.00	0.00
			M. O.:	1.25	0.32
			REC. :	4.43	1.15
			TOTAL:	16.56	4.27
P0033	PASAMANOS DE MADERA MARA	ML	MAT. :	14.90	3.86
	4" x 4"		H.-E.:	0.00	0.00
			M. O.:	9.25	2.38
			REC. :	17.54	4.52
			TOTAL:	41.69	10.76
P0090	PAVIMENTO RIGIDO DE 15 CMS	M2	MAT. :	39.25	10.14
	DE ESPESOR 1:2:3		H.-E.:	0.00	0.00
			M. O.:	11.55	3.00
			REC. :	26.70	6.91
			TOTAL:	77.50	20.05
P0022	PERSIANAS IMPORTADAS	M2	MAT. :	112.87	29.17
	PROVISION Y COLOCACION		H.-E.:	0.00	0.00
			M. O.:	1.76	0.45
			REC. :	28.88	7.45
			TOTAL:	143.51	37.07

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
P0005	PICADO DE MAMPOSTERIA 12 CM	M2	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	1.13	0.29
			REC. :	1.73	0.44
			TOTAL:	2.86	0.73
P0015	PIEDRA BRUTA	M3	MAT. :	35.00	9.04
	COLOCADO AL BOLEO		H.-E.:	0.00	0.00
	CON PROVISION		M. O.:	1.65	0.43
			REC. :	10.64	2.75
			TOTAL:	47.29	12.22
P0014	PINTADO DE SENALIZACION	M2	MAT. :	0.00	0.00
	HORIZONTAL A MANO S/PINTURA		H.-E.:	0.30	0.08
	PINTURA AMARILLA		M. O.:	1.50	0.38
			REC. :	2.37	0.60
			TOTAL:	4.17	1.06
P0026	PINTADO DE SENALIZACION	M2	MAT. :	7.35	1.90
	HORIZONTAL		H.-E.:	0.05	0.01
			M. O.:	0.03	0.00
			REC. :	1.77	0.44
			TOTAL:	9.20	2.35
P0009	PINTADO DE SENALIZACION	M2	MAT. :	31.08	8.03
	HORIZONTAL (A MANO)		H.-E.:	0.30	0.08
			M. O.:	1.50	0.38
			REC. :	9.58	2.47
			TOTAL:	42.46	10.96
P0011	PINTADO DE SENALIZACION	M2	MAT. :	10.12	2.62
	HORIZONTAL A MANO C/PINTURA		H.-E.:	0.30	0.08
	PINTURA BLANCA		M. O.:	1.50	0.38
			REC. :	4.71	1.21
			TOTAL:	16.63	4.29
P0012	PINTADO DE SENALIZACION	M2	MAT. :	6.45	1.67
	HORIZONTAL A MANO C/PINTURA		H.-E.:	0.30	0.08
	PINTURA AMARILLA		M. O.:	1.50	0.38
			REC. :	3.86	0.98
			TOTAL:	12.11	3.11
P0013	PINTADO DE SENALIZACION	M2	MAT. :	0.00	0.00
	HORIZONTAL A MANO S/PINTURA		H.-E.:	0.30	0.08
	PINTURA BLANCA		M. O.:	1.50	0.38
			REC. :	2.37	0.60
			TOTAL:	4.17	1.06

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
P0001	PINTURA ANTICORROSIVA	M2	MAT. :	3.02	0.78
			H.-E.:	0.00	0.00
			M. O.:	2.00	0.51
			REC. :	3.75	0.97
			TOTAL:	8.77	2.26
P0017	PINTURA ASFALTICA	M2	MAT. :	7.35	1.90
			H.-E.:	0.30	0.08
			M. O.:	3.76	0.97
			REC. :	7.50	1.95
			TOTAL:	18.91	4.90
P0031	PINTURA EN EXTERIORES LATEX O SIMILAR	M2	MAT. :	6.35	1.65
			H.-E.:	0.15	0.04
			M. O.:	3.76	0.97
			REC. :	7.23	1.87
			TOTAL:	17.49	4.53
P0030	PINTURA EN INTERIORES LATEX O SIMILARES	M2	MAT. :	2.61	0.68
			H.-E.:	0.00	0.00
			M. O.:	2.00	0.51
			REC. :	3.66	0.94
			TOTAL:	8.27	2.13
P0032	PINTURA LATEX CON SOPLETE	M2	MAT. :	2.16	0.56
			H.-E.:	0.00	0.00
			M. O.:	1.57	0.41
			REC. :	3.09	0.80
			TOTAL:	6.82	1.77
P0025	PIRUELADO SOBRE SUPERFICIES CON REVOQUE DE CEMENTO CAL Y ARENA	M2	MAT. :	6.52	1.68
			H.-E.:	0.00	0.00
			M. O.:	1.85	0.48
			REC. :	4.34	1.12
			TOTAL:	12.71	3.28
P0002	PISO DE CEMENTO MAS CONTRAPISO CARPETA DE CONCRETO DE 1:3:5 e=6cm frot/ 1:3 e/tot=31 cms	M2	MAT. :	15.66	4.05
			H.-E.:	0.00	0.00
			M. O.:	9.85	2.55
			REC. :	18.63	4.82
			TOTAL:	44.14	11.42
P0029	PISO DE CERAMICA COLOR SOBRE LOSA O PISO FROTACHADO	M2	MAT. :	39.60	10.24
			H.-E.:	0.00	0.00
			M. O.:	6.93	1.80
			REC. :	19.73	5.12
			TOTAL:	66.26	17.16

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
P0034	PISO DE LADRILLO GAMBOTE COLOCADO SOBRE MORTERO 1:5 (4 CM)	M2	MAT. :	13.02	3.38
			H.-E.:	0.00	0.00
			M. O.:	6.93	1.80
			REC. :	13.58	3.53
			TOTAL:	33.53	8.71
P0016	PISO DE LADRILLO MOLIDO	M2	MAT. :	1.54	0.40
			H.-E.:	0.00	0.00
			M. O.:	0.75	0.19
			REC. :	1.21	0.31
			TOTAL:	3.50	0.90
P0039	PISO DE MACHIMBRE INCLUYE MADERAMEN VIGAS CADA 40 CM.	M2	MAT. :	59.20	15.36
			H.-E.:	0.00	0.00
			M. O.:	9.54	2.47
			REC. :	28.27	7.32
			TOTAL:	97.01	25.15
P0003	PISO DE MOSAICO SOBRE LOSA O PISO FROTACHADO	M2	MAT. :	23.12	5.97
			H.-E.:	0.00	0.00
			M. O.:	6.93	1.80
			REC. :	15.92	4.13
			TOTAL:	45.97	11.90
P0007	PISO DE PARQUET CON CEPILLADO	M2	MAT. :	16.10	4.15
			H.-E.:	0.14	0.04
			M. O.:	5.54	1.44
			REC. :	12.21	3.17
			TOTAL:	33.99	8.80
P0004	PISO DE PIEDRA HUEVILLO CON CEMENTO SOBRE CARPETA CEMENTO E=0.04 M.	M2	MAT. :	12.28	3.17
			H.-E.:	0.00	0.00
			M. O.:	10.99	2.84
			REC. :	19.58	5.06
			TOTAL:	42.85	11.07
P0102	PISO DE PIEDRA TARIJA REFACCION CON MORTERO 1:4	M2	MAT. :	5.32	1.38
			H.-E.:	0.00	0.00
			M. O.:	6.93	1.80
			REC. :	11.79	3.07
			TOTAL:	24.04	6.25
P0904	PISO DE VINILO SOBRE LOSA O PISO FROTACHADO	M2	MAT. :	24.40	6.31
			H.-E.:	0.00	0.00
			M. O.:	4.62	1.20
			REC. :	12.69	3.29
			TOTAL:	41.71	10.80

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
M0028	PISO MOSAICO GRANITICO ESTRIADO SOBRE LOSA O PISO FROTACHADO MORTERO 1:3	M2	MAT. :	28.25	7.30
			H.-E.:	0.00	0.00
			M. O.:	6.93	1.80
			REC. :	17.10	4.44
			TOTAL:	52.28	13.54
M0029	PISO MOSAICO GRANITICO SOBRE LOSA O PISO FROTACHADO MORTERO 1:3 (SIN PROVISION)	M2	MAT. :	6.62	1.71
			H.-E.:	0.00	0.00
			M. O.:	6.93	1.80
			REC. :	12.09	3.15
			TOTAL:	25.64	6.66
M0027	PISO MOSAICO GRANITICO SOBRE LOSA O PISO FROTACHADO MORTERO 1:3	M2	MAT. :	47.82	12.36
			H.-E.:	0.00	0.00
			M. O.:	6.93	1.80
			REC. :	21.65	5.62
			TOTAL:	76.40	19.78
P0101	PISO PIEDRA TARIJA COLOR CAFE ASENTADO CON MORTERO 1:4	M2	MAT. :	52.57	13.59
			H.-E.:	0.00	0.00
			M. O.:	6.93	1.80
			REC. :	22.75	5.90
			TOTAL:	82.25	21.29
P0010	PISOS CARPETA DE CEMENTO 1:5 E=2CMS	M2	MAT. :	3.44	0.89
			H.-E.:	0.00	0.00
			M. O.:	2.77	0.72
			REC. :	5.01	1.31
			TOTAL:	11.22	2.92
P0049	PISOS DE CEMENTO CON OCRE E=5 CM ACABADO	M2	MAT. :	12.24	3.16
			H.-E.:	0.00	0.00
			M. O.:	5.39	1.40
			REC. :	11.05	2.87
			TOTAL:	28.68	7.43
E0019	PISOS PARA CANCHAS DE BASQUET e = 7.5 cm, JUNTAS C/2 m	M2	MAT. :	19.66	5.07
			H.-E.:	0.00	0.00
			M. O.:	6.37	1.64
			REC. :	14.25	3.67
			TOTAL:	40.28	10.38
P0042	PLACAS DE ACRILICO (COLOCACION Y PROVISION)	M2	MAT. :	57.57	14.86
			H.-E.:	0.00	0.00
			M. O.:	3.24	0.84
			REC. :	18.28	4.73
			TOTAL:	79.09	20.43

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
P0008	PUENTE DE HORMIGON PRETENSADO (ESTIMADO)	ML	MAT. :	20,250.00	5,250.00
			H.-E.:	0.00	0.00
			M. O.:	0.00	0.00
			REC. :	4,698.00	1,218.00
			TOTAL:	24,948.00	6,468.00
P0110	PUERTA CONTRAPLACADA VENESTA MARA - COLOCADA EN OBRA INCLUYE MARCO	M2	MAT. :	81.59	21.14
			H.-E.:	8.35	2.15
			M. O.:	30.37	7.84
			REC. :	67.10	17.34
			TOTAL:	187.41	48.47
P0006	PUERTA DE MALLA OLIMPICA	M2	MAT. :	141.81	36.45
			H.-E.:	0.00	0.00
			M. O.:	11.06	2.85
			REC. :	49.73	12.79
			TOTAL:	202.60	52.09
P0126	PUERTA METALICA DE PLANCHA DE 1/8"	M2	MAT. :	135.37	34.88
			H.-E.:	0.15	0.04
			M. O.:	17.33	4.47
			REC. :	57.83	14.91
			TOTAL:	210.68	54.30
P0100	PUERTA TABLERO DE MADERA MARA INCLUYE MARCO (2"x3") COLOCADO EN OBRA	M2	MAT. :	74.91	19.46
			H.-E.:	8.35	2.15
			M. O.:	46.12	11.89
			REC. :	89.53	23.11
			TOTAL:	218.91	56.61
R0100	RAYAS DE PARADA DE E= 0.05 MTS PASO PEATONAL CON SEMAFORO	ML	MAT. :	14.70	3.80
			H.-E.:	0.08	0.02
			M. O.:	1.93	0.50
			REC. :	6.38	1.65
			TOTAL:	23.09	5.97
R0090	RECUBRIMIENTO CON HORMIGON SIMPLE DE 7 CMS DE ESP. PARA GAVIONES	M2	MAT. :	13.71	3.54
			H.-E.:	0.00	0.00
			M. O.:	4.31	1.12
			REC. :	9.74	2.53
			TOTAL:	27.76	7.19
U2003	REDUCCION DE P.V.C. DE 3 x 2" PROVISION Y COLOCACION	PZA	MAT. :	9.40	2.43
			H.-E.:	0.00	0.00
			M. O.:	15.02	3.87
			REC. :	25.05	6.45
			TOTAL:	49.47	12.75

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
R0016	REFORESTACION	HREA	MAT. :	4,860.00	1,242.00
			H.-E.:	0.00	0.00
			M. O.:	135.00	34.72
			REC. :	1,333.06	341.01
			TOTAL:	6,328.06	1,617.73
R0019	REFUGIO PEATONAL CON TECHO DE CALAMINA Y DOS SOPORTES	PZA	MAT. :	1,183.45	266.77
			H.-E.:	0.00	0.00
			M. O.:	123.93	31.97
			REC. :	400.72	94.44
			TOTAL:	1,708.10	393.18
R0023	REFUGIOS PEATONALES CON ACRILICO	PZA	MAT. :	2,136.42	550.88
			H.-E.:	0.00	0.00
			M. O.:	97.94	25.33
			REC. :	595.36	153.59
			TOTAL:	2,829.72	729.80
R0091	REJILLA PARA PISO COLOCACION Y PROVISION	PZA	MAT. :	18.80	4.86
			H.-E.:	0.00	0.00
			M. O.:	3.45	0.89
			REC. :	9.61	2.48
			TOTAL:	31.86	8.23
C0104	REJILLA PARA SUMIDERO TIPOS IV Y V COLOCACION SIN PROVISION	PZA	MAT. :	16.40	4.23
			H.-E.:	0.00	0.00
			M. O.:	12.86	3.33
			REC. :	23.39	6.06
			TOTAL:	52.65	13.62
C0023	REJILLA PARA SUMIDERO COLOCACION SIN PROVISION	PZA	MAT. :	2.85	0.73
			H.-E.:	0.00	0.00
			M. O.:	6.91	1.79
			REC. :	11.18	2.90
			TOTAL:	20.94	5.42
C0103	REJILLA PARA SUMIDERO PROVISION Y COLOCACION	UN	MAT. :	27.85	63.23
			H.-E.:	0.00	0.00
			M. O.:	6.91	1.79
			REC. :	16.98	17.40
			TOTAL:	51.74	82.42
R0018	RELLENO DE TIERRA COMPACTACION CON APISONADOR MANUAL	M3	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	4.50	1.16
			REC. :	6.86	1.78
			TOTAL:	11.36	2.94

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
R0012	RELLENO DE TIERRA CON REEMPLAZO DE MATERIAL	M3	MAT. :	12.50	3.23
			H.-E.:	0.00	0.00
			M. O.:	1.50	0.39
			REC. :	5.20	1.34
			TOTAL:	19.20	4.96
R0014	RELLENO DE TIERRA CON REEMPLAZO DE MATERIAL (SEGUNDO ANALISIS)	M3	MAT. :	12.50	3.23
			H.-E.:	0.00	0.00
			M. O.:	1.20	0.31
			REC. :	4.74	1.22
			TOTAL:	18.44	4.76
R0003	RELLENO Y COMPACTADO COMPACTADOR MANUAL	M3	MAT. :	0.00	0.00
			H.-E.:	5.96	1.54
			M. O.:	3.38	0.87
			REC. :	6.53	1.68
			TOTAL:	15.87	4.09
R0002	RELLENO Y COMPACTADO CON EQUIPO PESADO	M3	MAT. :	0.00	0.00
			H.-E.:	5.45	1.41
			M. O.:	0.11	0.03
			REC. :	1.44	0.38
			TOTAL:	7.00	1.82
R0011	REMOSION DE ADOQUIN	M2	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	1.06	0.27
			REC. :	1.61	0.41
			TOTAL:	2.67	0.68
R0021	REMOSION DE EMPIEDRE CON TRANSPORTE	M2	MAT. :	0.00	0.00
			H.-E.:	2.32	0.60
			M. O.:	0.52	0.14
			REC. :	1.34	0.36
			TOTAL:	4.18	1.10
R0017	REMOSION DE LOSETAS	M2	MAT. :	0.00	0.00
			H.-E.:	0.00	0.00
			M. O.:	0.85	0.22
			REC. :	1.30	0.33
			TOTAL:	2.15	0.55
R0010	REMOSION Y REPOSICION DE ADOQUIN	M2	MAT. :	2.80	0.72
			H.-E.:	0.00	0.00
			M. O.:	5.37	1.39
			REC. :	8.84	2.29
			TOTAL:	17.01	4.40

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
R0022	REPARACION DE CANALETAS Y BAJANTES	ML	MAT. :	2.31	0.60
			H.-E.:	0.00	0.00
			M. O.:	2.16	0.56
			REC. :	4.26	1.12
			TOTAL:	8.73	2.28
R0020	REPARACION DE CUBIERTA DE CALAMINA	M2	MAT. :	0.81	0.21
			H.-E.:	0.00	0.00
			M. O.:	6.12	1.59
			REC. :	9.50	2.48
			TOTAL:	16.43	4.28
R0006	REVESTIMIENTO CON MORTERO DE CEMENTO 1:3 E=7 CM.	M2	MAT. :	17.30	4.46
			H.-E.:	0.00	0.00
			M. O.:	11.39	2.95
			REC. :	21.35	5.53
			TOTAL:	50.04	12.94
00012	REVESTIMIENTO CON PIEDRA SELECCIONADA	M2	MAT. :	17.66	4.56
			H.-E.:	0.00	0.00
			M. O.:	4.31	1.12
			REC. :	10.67	2.77
			TOTAL:	32.64	8.45
R0009	REVESTIMIENTO DE AZULEJO BLANCO	M2	MAT. :	23.80	6.15
			H.-E.:	0.00	0.00
			M. O.:	16.17	4.20
			REC. :	30.14	7.82
			TOTAL:	70.11	18.17
R0024	REVESTIMIENTO DE CERAMICA	M2	MAT. :	47.49	12.27
			H.-E.:	0.00	0.00
			M. O.:	16.17	4.20
			REC. :	35.64	9.24
			TOTAL:	99.30	25.71
R0015	REVESTIMIENTO DE PENTAGRES	M2	MAT. :	40.76	10.53
			H.-E.:	0.00	0.00
			M. O.:	13.86	3.59
			REC. :	30.56	7.91
			TOTAL:	85.18	22.03
I0020	REVESTIMIENTO DE PIEDRA CORTADA PARA GAVIONES	M3	MAT. :	25.04	6.40
			H.-E.:	0.00	0.00
			M. O.:	8.15	2.12
			REC. :	18.22	4.71
			TOTAL:	51.41	13.23

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
R0008	REVOQUE CON CEMENTO	M2	MAT. :	4.05	1.05
			H.-E.:	0.00	0.00
			M. O.:	7.23	1.88
			REC. :	11.94	3.11
			TOTAL:	23.22	6.04
R0004	REVOQUE DE ESTUCO (YESO)	M2	MAT. :	5.08	1.27
			H.-E.:	0.00	0.00
			M. O.:	5.69	1.47
			REC. :	9.84	2.53
			TOTAL:	20.61	5.27
E0009	REVOQUE DE ESTUCO EN CIELO RASO (YESO)	M2	MAT. :	13.41	3.42
			H.-E.:	0.00	0.00
			M. O.:	9.99	2.59
			REC. :	18.32	4.74
			TOTAL:	41.72	10.75
R0007	REVOQUE EXTERIOR CON CAL-CEMENTO-ARENA	M2	MAT. :	6.27	1.61
			H.-E.:	0.00	0.00
			M. O.:	8.62	2.24
			REC. :	14.58	3.77
			TOTAL:	29.47	7.62
C0011	RIELES COLOCACION SIN PROVISION	PZA	MAT. :	2.85	0.73
			H.-E.:	0.00	0.00
			M. O.:	6.91	1.79
			REC. :	11.18	2.90
			TOTAL:	20.94	5.42
C0100	RIELES PARA SUMIDEROS COLOCACION	ML	MAT. :	29.85	7.67
			H.-E.:	0.00	0.00
			M. O.:	6.91	1.79
			REC. :	17.45	4.51
			TOTAL:	54.21	13.97
00015	RIPIADO E = 0.10 M.	M2	MAT. :	4.20	1.09
			H.-E.:	0.00	0.00
			M. O.:	0.23	0.06
			REC. :	1.32	0.35
			TOTAL:	5.75	1.50
00018	ROLLIZOS DE 3" x 7 PIES DE LARGO PARA PARANTES	PZA	MAT. :	5.13	1.31
			H.-E.:	0.00	0.00
			M. O.:	1.38	0.36
			REC. :	3.30	0.86
			TOTAL:	9.81	2.53

C A T A L O G O D E P R E C I O S U N I T A R I O S ALFABETICO

Banco de datos:super

CLAVE	CONCEPTO:	UNIDAD	RUBRO	COSTO EN Bs	COSTO EN $us
00016	ROLLIZOS DE MADERA DE 4" Y 7 PIES DE LARGO PARA PARANTES	PZA	MAT. :	6.75	1.73
			H.-E.:	0.00	0.00
			M. O.:	1.93	0.50
			REC. :	4.52	1.17
			TOTAL:	13.20	3.40
S0001	SILLARES TIPO A PROVISION Y COLOCACION	M2	MAT. :	145.18	32.90
			H.-E.:	0.00	0.00
			M. O.:	17.86	4.63
			REC. :	60.88	14.69
			TOTAL:	223.92	52.22
S0006	SILLARES TIPO A PROV. Y COLOC. (REPARACION DENTRO DE BOVEDAS)	M2	MAT. :	145.18	32.90
			H.-E.:	0.00	0.00
			M. O.:	26.78	6.95
			REC. :	87.65	21.32
			TOTAL:	259.61	61.17
S0005	SILLARES TIPO B EXTRACCION Y SUSTITUCION	M2	MAT. :	162.17	42.93
			H.-E.:	0.00	0.00
			M. O.:	12.30	3.19
			REC. :	56.35	14.82
			TOTAL:	230.82	60.94
S0002	SILLARES TIPO B PROVISION Y COLOCACION	M2	MAT. :	162.26	42.95
			H.-E.:	0.00	0.00
			M. O.:	17.86	4.63
			REC. :	64.84	17.01
			TOTAL:	244.96	64.59
S0007	SILLARES TIPO B PROV. Y COLOC. (REPARACION DENTRO DE BOVEDAS)	M2	MAT. :	162.26	42.95
			H.-E.:	0.00	0.00
			M. O.:	26.78	6.95
			REC. :	78.41	20.54
			TOTAL:	267.45	70.44
S0019	SOBRECIMIENTOS DE H.C. 1:2:4 50 % PIEDRA DESPLAZADORA	M3	MAT. :	165.48	42.74
			H.-E.:	0.00	0.00
			M. O.:	25.22	6.54
			REC. :	76.79	19.88
			TOTAL:	267.49	69.16
S1000	SUBBASE P/PAVIMENTO	M3	MAT. :	20.19	5.20
			H.-E.:	20.90	5.40
			M. O.:	1.12	0.28
			REC. :	11.25	2.88
			TOTAL:	53.46	13.76