Tables

Table 1.1.1 AREA, POPULATION AND POPULATION DENSITY ACCORDING TO POPULATION CENSUSES, 1961, 1974 AND 1988 (WHOLE COUNTRY)

Department	Area (km2)	Population			Annual Population Growth Rate (%)		Population Density (persons/km2)		
		1961	1974	1988	1961-1974	1974-1988	1961	1974	1988
Honduras	112,088	1,884,765	2,656,948	4,376,839	2.68	3.63	16.8	23.7	39.0
Department									
1. Atlantida	4,251	92,914	148,285	237,180	3.66	3.41	21.9	34.9	55.8
2. Colon	8,875	41,904	77,750	146,224	4.87	4.62	4.7	8.8	16.5
3. Comayagua	5,196	96,442	136,619	238,790	2.72	4.07	18.6	26.3	46.0
4. Copan	3,203	126,183	151,859	218,864	1.43	2.65	39.4	47.4	68.3
5. Cortes	3,954	200,099	369,616	644,807	4.83	4.05	50.6	93.5	163.1
6. Choluteca	4,211	149,175	193,336	293,260	2.01	3.02	35.4	45.9	69.6
7. El Paraiso	7,218	106,823	140,793	255,400	2.15	4.35	14.8	19.5	35.4
8. Francisco Morazan	7,946	284,428	453,597	797,611	3.66	4.11	35.8	57.1	100.4
9. Gracias a Dios	16,630	10,905	20,738	34,159	5.07	3.63	0.7	1.2	2.1
10. Intibuca	3,072	73,138	81,815	123,512	0.87	2.99	23.8	26.6	40.2
11. Islas de la Bahia	261	8,961	13,194	21,553	3.02	3.57	34.3	50.6	82.6
12. La Paz	2,331	60,600	66,046	105,996	0.66	3.44	26.0	28.3	45.5
13. Lempira	4,290	111,546	127,782	175,450	1.05	2.29	26.0	29.8	40.9
14. Ocotepeque	1,680	52,540	51,038	74,286	-0.22	2.72	31.3	30.4	44.2
15. Olancho	24,351	110,744	151,436	282,018	2.44	4.54	4.5	6.2	11.6
16. Santa Barbara	5,115	146,909	186,106	277,995	1.84	2.91	28.7	36.4	54.3
17. Valle	1,565	80,907	91,901	119,889	0.98	1.92	51.7	58.7	76.6
18. Yoro	7,939	130,547	195,037	329,845	3.14	3.82	16.4	24.6	41.5

Source : Poblacion y Vivienda por Departamento y Municipio, Censo 1974 y Censo 1988 (Recuento Preliminar), Secretaria de Planificacion, Coordinacion y Presupuesto.

Table 1.1.2 GROSS DOMESTIC PRODUCT (GDP) AND GROSS NATIONAL PRODUCT, 1984 - 1987

Unit : Million lempiras

Item	1984	1985	1986	1987	Average Annual Growth Rate (%) 1984 - 1986
GDP by Economic activity at constant factor cost (1978 = 100)					
Agriculture	1,053	1,084	1,102	1,181	3.9
Mining Industry	87	89	87	75	-4.8
Manufacturing Industry	578	565	580	590	0.7
Construction	222	218	200	204	-2.8
Electricity, Gas and Water	52	55	60	60	4.9
Transportation & Communication	303	306	316	338	3.7
Wholesale & Retail	456	457	484	493	2.6
Banking, Insurance & Real estate	218	222	230	244	3.8
Dwelling property	236	254	258	272	4.8
Pub. administration & Defence	175	189	198	215	7.1
Other services	340	350	362	379	3.7
GDP at constant factor cost	3,720	3,789	3,877	4,051	2.9
Annual growth rate (%)	2.0	1.9	2.3	4.5	
GDP at market prices in real terms	4,175	4,308	4,426	4,612	3.4
Annual growth rate (%)	2.8	3.2	2.7	4.2	
Net factor payments from abroad	-197	-222	-244	-245	
GNP	3,978	4,086	4,182	4,367	3.2
Annual growth rate (%)	2.5	2.7	2.3	4.4	
Real GNP per capita (in lempiras)	1,070	1,068	1,062	1,078	0.2
at current prices					
GDP at factor cost	5,757	6,135	6,630	7,060	7.0
Annual growth rate (%)	6.2	6.6	8.1	6.5	
GNP	6,154	6,643	7,186	7,654	7.5
Annual growth rate (%)	7.0	7.9	8.2	6.5	
GNP per capita (in lempiras)	1,656	1,736	1,825	1,889	4.5

Source : Banco Central de Honduras, 1984-1986, 1985-1987

Table 1.1.3 EXPORTS (FOB), 1982 - 1987

Unit : Million lempiras

Products	1982	1983	1984	1985	1986	1987	Average Annual Growth Rate (%) 1982 - 1987
Bananas	436.6	406.3	464.5	547.0	513.5	648.5	8.2
Coffee	306.2	302.4	338.2	370.4	644.1	416.7	6.4
Wood	89.3	80.8	69.7	68.2	64.6	72.6	-4.1
Lead & Zinc	32.4	49.6	76.1	71.8	64.9	27.0	-3.6
Silver	18.6	35.1	31.0	26.0	25.1	10.8	-10.3
Petroleum product	1.2	7.9	9.4	11.9	0.9	4.0	27.2
Frozen meat	67.8	62.7	42.4	36.3	39.9	42.2	-9.0
Shrimp & lobster	55.9	72.0	99.6	81.9	90.9	122.8	17.0
Sugar	43.2	55.7	51.3	42.9	25.0	39.0	-2.0
Tobacco	21.5	21.6	16.7	17.3	10.6	7.1	-19.9
Cotton	13.0	8.4	15.4	13.6	9.3	6.5	-12.9
Detergents	19.5	22.1	12.0	4.7	2.9	1.9	-37.2
Resin	8.5	3.1	3.3	2.9	2.6	2.7	-20.5
Cement	1.5	-	-	0.2	1.7	4.0	21.7
Canned fruits	9.4	7.8	10.1	11.6	12.4	6.5	-7.1
Others	184.6	208.1	211.0	222.5	200.1	239.1	5.3
Total	1309.2	1343.6	1450.7	1529.2	1708.5	1651.4	4.8

Source : Banco Central de Honduras.

Table 1.1.4 IMPORTS (CIF), 1982 - 1987

Unit : Million lempiras

Goods	1982	1983	1984	1985	1986	1987	Average Annual Growth Rate (%) 1982 - 1987
Food products	116.9	146.5	154.4	160.7	165.8	178.8	8.9
Beverage & tobacco	8.9	5.0	9.3	9.1	9.1	9.5	1.3
Non edible Raw materials	14.2	19.5	18.9	18.8	19.7	19.3	6.3
Oil & lubricants	340.1	327.6	359.3	317.1	194.7	208.0	-9.4
Vegetable & animal Oil & fats	10.8	9.9	13.5	14.8	15.1	16.1	8.3
Chemical products	256.8	337.6	337.4	353.8	403.9	406.0	9.6
Manufactured products	395.6	458.3	497.4	489.0	492.4	508.8	5.2
Machinery & transportation material	274.1	297.2	393.0	404.1	406.6	415.9	8.7
Others	6.3	3.6	3.6	8.8	42.8	34.9	40.8
Total	1423.7	1605.2	1786.8	1776.2	1750.1	1797.3	4.8

Source : Banco Central de Honduras.

Table 1.1.5 BALANCE OF INTERNATIONAL PAYMENTS, 1982 - 1987

Unit : Million lempiras

Account	1982	1983	1984	1985	1986	1987
1. Trade balance	-8.4	-115.2	-295.6	-179.1	34.4	-62.6
(1) Export (FOB)[1/]	1,353.0	1,397.3	1,474.0	1,579.2	1,782.5	1,725.1
(2) Import (FOB)	1,361.4	1,512.5	1,769.6	1,758.3	1,748.1	1,787.7
2. Service account	-500.4	-412.2	-497.3	-520.4	-561.3	-596.6
3. Transfer account	60.0	89.0	160.0	291.2	316.7	292.6
4. Current account	-448.8	-438.4	-632.9	-408.3	-210.2	-366.6
5. Capital account	254.1	388.1	648.2	510.1	259.0	353.8
6. Errors & Omissons	9.7	14.5	-21.9	-66.9	-60.6	95.3
7. Balance of international payment	-185.0	-35.8	-6.6	34.9	-11.8	82.5

Source : Banco Central de Honduras.
Note : 1/ Non monetary gold is included.

Table 1.1.6 REVENUE AND EXPENDITURE OF THE CENTRAL GOVERNMENT, 1982 - 1987

Unit : Million lempiras

Particulars	1982	1983	1984	1985	1986	1987
Revenue	1,483.2	1,632.0	2,031.2	2,146.3	2,216.5	2,369.6
Current revenue	772.7	801.5	977.3	1,091.1	1,179.8	1,320.9
Tax revenue	715.4	711.1	881.3	985.8	997.3	1,116.5
Income tax	198.8	190.3	233.9	240.6	250.2	297.9
Tax on property	7.4	7.0	8.0	8.8	8.5	10.6
Tax on production,domestic trade & transaction	237.1	233.8	292.5	326.4	333.0	365.3
Import duties	178.1	201.5	258.8	316.6	301.2	345.2
Export duties	93.3	77.8	87.3	92.5	103.5	95.8
Others taxes	0.7	0.7	0.8	0.9	0.9	1.7
Non-tax revenue	11.1	11.0	13.7	19.2	10.5	18.2
Transfer	21.0	35.5	44.8	45.9	44.2	46.7
Other revenue	25.2	43.9	37.5	40.2	127.8	139.5
Capital revenue	719.3	855.5	1060.2	1059.5	1004.7	894.7
Internal debt	408.7	487.5	460.2	555.2	565	564.4
External debt	310.6	334.2	478	389.3	313.6	224.2
Transfer	-	33.8	122	115	126.1	106.1
Others	-8.8	-25.0	-6.3	-4.3	32.0	154.0
Expenditure	1,483.2	1,632.0	2,031.2	2,146.3	2,216.5	2,369.6
Current expenditure	868.1	990.4	1,078.7	1,235.8	1,354.0	1,516.5
Consumption	749.1	860.5	963.5	1,078.0	1,178.2	1,342.3
Current transfers	119.0	129.9	115.2	157.8	175.8	174.2
Capital expenditure	261.8	276.8	406.7	351.4	329.5	315.1
Direct investment	153.5	-	-	-	-	-
Indirect investment	108.3	161.6	200.0	207.9	202.4	207.9
Pre-investment	-	115.2	206.7	143.5	127.1	107.2
Net lending	205.9	163.2	234.0	156.3	90.7	80.1
Public debt service	147.4	201.6	311.8	402.8	442.3	457.9
Internal	118.4	169.8	268.2	327.4	361.6	386.2
External	29.0	31.8	43.6	75.4	80.7	71.7

Source : Banco Central de Honduras.

Table 1.2.1 PRESENT WATER SUPPLIES IN STUDY AREA

Municipality	Population (1988) Total	Urban	Rural	Served Popu. 1988	(%)	Population (Not Served) Total	Urban	Rural	Administrative Authority	System and Water Source
1. Comayagua	59,534	36,416	23,118	30,084	51	29,450	6,332	23,118	SANAA	Piped/Spring
2. Ajuterique	6,803	3,666	3,137	3,670	54	3,133	0	3,133	Municipal	Piped/Spring
3. Humuya	1,371	0	1,371	1,371	100	0	0	0	Municipal	
4. Lamani	3,572	0	3,572	3,572	100	0	0	0	Municipal	Piped/River
5. Lejamani	3,123	2,797	326	2,790	89	333	7	326	Municipal	Piped/Spring
6. San Sebastian	1,506	0	1,506	1,506	100	0	0	0	Municipal	Piped/River
7. Villa de San Anto.	11,429	5,746	5,683	5,750	50	5,679	0	5,679	Municipal	Piped
8. La Paz*1	19,900	10,965	8,935	12,240	62	7,660	0	7,660	SANAA	Piped/River & Spring
9. Cane	1,937	0	1,937	1,776	92	161	0	161	SANAA	Piped/La Paz
Total	109,175	59,590	49,585	62,759*2	57	46,416	6,339	40,077		

*1 Including Yarumela (Piped system, Deep well water source)
*2 Served Population; Urban = 53,251 (59,590 - 6,339)
Rural = 9,508 (49,585 - 40,077)

Table 1.2.2 WATER CONSUMPTION / PER CAPITA CONSUMPTION ANALYSIS

Sample No.	1.	2.	3.	4.	5.
Water consumption (litre/day)	120	60	60	100	120
No. Family member	5	3	10	5	4
Per capita consumption (LPCD)	24	20	6	20	30

Note: 1. Water consumption is obtained by water bringing times per day multiplying volume of container or bucket used.

2. Per capita consumption is estimated by - water consumption (l/day) divided by No. family member.

Table 2.1.1 WORKING QUANTITIES OF FIELD INVESTIGATIONS

Item	Quantity	Remarks
1. Meteoro-Hydrological Survey		
(1) Runoff measurement	4 times	performed by the JICA Team[1/]
(2) Monthly runoff measurement	6 times	perfprmed by MPH
2. Geophysical Exploration		
(1) VLF electromagnetic survey	111 points	performed by the JICA Team
(2) Electric resistivity survey	91 points	do
3. Observation of Groundwater level		
(1) Simultaneous observation	3 times	do
(2) Monitoring (by automatic recorder & manual)	6 wells	do
4. Water Quality Analysis		
(1) for hydrogeological purposes	46 samples	do
(2) for drinking water	46 samples	performed by the MPH
(3) test wells	9 samples	performed by the JICA Team & MPH[2/]
5. Well Drilling and related Works (at five locations)		
(1) Well drilling		performed by Contructor[3/]
a. Pumping well (test well)	505 m	
b. observation hole	570 m	
(2) Casing & screens		
a. Pumping well (test well)	496 m	
b. observation hole	515 m	
(3) Logging	5 lots	do
(4) Pumping test	5 lots	do
(5) Installation of temporary water supply facilities	5 lots	

Note: 1. JICA study team in cooperation with MPH counterpart engineers
2. Of 9 samples, 5 samples were collected at the end of the continuous pumping test and 4 samples are in-situ samples.
3. Contractor selected by the JICA study team

Table 2.4.1 ASSIGNMENT OF MPH COUNTERPART ENGINEERS

Position	Name of Counterpart Engineer	Assignment Schedule
Chief Counterpart	Juan Rafael Delcid F.	Feb. 1988 - Sep. 1989
Geologist/Hydro-geologist	Hêctor Javier Cruz	Feb. 1988 - Mar. 1989
	Leonel Mendieta	Feb. 1988 - Mar. 1989
Water Balance Engineer	Samuel Porfirio Alvarado	Feb. 1988 - Mar. 1989
	Marco Antonio Zûniga	Feb. 1989 - Mar. 1989
Water Quality Specialist	Jorge Mêndez	June to Aug. 1988,
	Wilberto Velasquez	Dec. 1988 - Feb. 1989
Geophysicist	Jorge Mêndez	June 1988 - July 1988
	Julio Serrano	June 1988 - July 1988
Well Drilling Expert	Pedro Castro	Sep. 1988 - Feb. 1989
	Isidro Ramos	Sep. 1988 - Feb. 1989
	Efrain Hernandez	Sep. 1988 - Feb. 1989
Water Supply System Engineer	Juan Rafael Delcid	Feb. 1988 - Sept. 1989
	Porfirio Diaz Mejia	Mar. 1988,
	Carlos Caceres	Jan. - Mar., 1989
Socio-economist	Noel Oswaldo Alvarez Barrera	MAr. 1988, Jan. - Mar. 1989
Secretary	Maria del Carmen Anariba	Feb. 1988 - Sep. 1989
	Suyapa Trejo de Bonilla	Feb. 1988 - Sep. 1989
Driver	Santos Villalobos	Feb. 1988 - Sep. 1989
	Wilfredo Martinez	May 1988 - Sep. 1989

Table 3.1.1 AREA AND POPULATION ACCORDING TO POPULATION CENSUSES, 1961, 1974 AND 1988 (STUDY AREA)

Department & Municipality	Population			Annual Population Growth Rate (%)	
	1961	1974	1988	1961-1974	1974-1988
Departments in Region-2					
1. Department Comayagua	96,442	136,619	238,790	2.72	4.07
2. Department La Paz	60,600	66,046	105,996	0.66	3.44
3. Department Intibuca	73,138	81,815	123,512	0.87	2.99
Total	230,180	284,480	468,298	1.64	3.62
Municipalities in Study Area					
1. Municipality Comayagua	19,055	30,760	59,534	3.75	4.83
2. Municipality Ajuterique	3,132	5,126	6,803	3.86	2.04
3. Municipality Humuya	581	601	1,371	0.26	6.07
4. Municipality Lamani	2,844	2,850	3,572	0.02	1.63
5. Municipality Lejamani	1,455	2,127	3,123	2.96	2.78
6. Municipality San Sebastian	1,269	1,527	1,506	1.43	-0.10
7. Municipality Villa de San Antonio 1/	4,408	6,169	11,429	2.62	4.50
8. Municipality La Paz 2/	8,876	11,775	19,900	2.20	3.82
9. Municipality Cane	1,164	1,370	1,937	1.26	2.50
Total	42,784	62,305	109,175	2.93	4.09

Source : Poblacion y Vivienda por Departamento y Municipio, Censo 1974 y Censo 1988 (Recuento Preliminar), Secretaia de Planificacion, Coordinacion y Presupuesto.

Note :1/ Municipality Villa de San Antonio includes both communities, San Nicolas & Flores.
2/ Municipality La Paz includes community Yarumela.

Table 3.1.2 POPULATION IN URBAN AND RURAL AREAS ACCORDING TO THE 1974 AND 1988 CENSUSES

Unit : persons

Department & Municipality	1974					1988				
		Urban		Rural			Urban		Rural	
	Total	Number	%	Number	%	Total	Number	%	Number	%
Honduras	2,656,948	833,179	31.4	1,823,769	68.6	4,376,839	1,751,505	40.0	2,625,334	60.0
Department in Region-2										
1. Department Comayagua	136,619	38,535	28.2	98,084	71.8	238,790	87,705	36.7	151,085	63.3
2. Department La Paz	66,046	9,994	15.1	56,052	84.9	105,996	18,509	17.5	87,487	82.5
3. Department Intibuca	81,815	8,309	10.2	73,506	89.8	123,512	15,520	12.6	107,992	87.4
Total	284,480	56,838	20.0	227,642	80.0	468,298	121,734	26.0	346,564	74.0
Municipalities in Study Area										
1. Municipality Comayagua	30,760	15,941	51.8	14,819	48.2	59,534	36,416	61.2	23,118	38.8
2. Municipality Ajuterique	5,126	2,757	53.8	2,369	46.2	6,803	3,666	53.9	3,137	46.1
3. Municipality Humuya	601	0	0.0	601	100.0	1,371	0	0.0	1,371	100.0
4. Municipality Lamani	2,850	0	0.0	2,850	100.0	3,572	0	0.0	3,572	100.0
5. Municipality Lejamani	2,127	0	0.0	2,127	100.0	3,123	2,797	89.6	326	10.4
6. Municipality San Sebastian	1,527	0	0.0	1,527	100.0	1,506	0	0.0	1,506	100.0
7. Municipality Villa de San Antonio	6,169	2,359	38.2	3,810	61.8	11,429	5,746	1/ 50.3	5,683	49.7
8. Municipality La Paz	11,775	6,811	57.8	4,964	42.2	19,900	10,965	55.1	8,935	44.9
9. Municipality Cane	1,370	0	0.0	1,370	100.0	1,937	0	0.0	1,937	100.0
Total	62,305	27,868	44.7	34,437	55.3	109,175	59,590	54.6	49,585	45.4

Source : Poblacion y Vivienda por Departamento y Municipio, Censo 1974 y Censo 1988 (Recuento Preliminar), Secretaia de Planificacion, Coordinacion y Presupuesto.

Note :1/ Population in the urban area of Municipality Villa de San Antonio includes the population of Flores.

Table 3.2.1 STANDARD GEOLOGICAL SEQUENCE OF HONDURAS

AGE		FORMATION NAME	ROCK FACIES
	Quaternary	(Sedimentary Deposits)	Recent continental and marine sediments.
		(Volcanic Deposits)	Sills and flows of basalt and andesite, and pyroclastic deposits.
TERTIARY	Pliocene	Gracias Formation	Continental sedimentary rocks of lucastrine origin shale, sandstone and conglomerate.
TERTIARY	Miocene	Padre Miguel Group	Ignimbrite, tuff, pyroclastic rocks of rhyolite, andesite. Sedimentary rocks derived from them.
TERTIARY	Miocene	Matagalpa Formation	Basalt, andesite, rhyolite flows and pyroclastics from subaerial volcanoes.
MESOZOIC	Cretaceous	Esquias Formation	Limestone and Marl.
MESOZOIC	Cretaceous	Valle de Angeles Group	Redbeds of sandstone, shale, mudstone, quartz conglomerate.
MESOZOIC	Cretaceous	Yojoa Group	Well stratified limestone, shale, marls, dolomites, sequence of marine calcareous sediments.
MESOZOIC	Jurassic?	Todos los Santos Formation	Redbeds of quartz conglomerate, sandstone, mudstone shale and volcanic rocks.
MESOZOIC	Trias?	El Plan Formation	Dark grey claystone and shales with thin beds of sandstone.
Paleozoic		Metamorphic rocks	Foliated sericite and graphite schist, quartzite and metasediments.
Tertiary-Cretaceous		Intrusive rocks	Granite, diolite, granodiorite, gabbro, etc.

Table 4.1.1 (1) FIELD DATA AND ANALYSIS RESULTS OF VLF EXPLORATION (1/3)

Spot No.	Field Data		The First Layer		The 2nd Lay.	
	Appa.OHM	Angle(°)	Resist.(ohm)	Thick.(m)	Resist.(ohm)	Loc. of neaby ES STA.
1	110	56	300	12	60	
2	40	70	100	14	7	
3	7	45	7	-	7	STA 1
4	10	36	10	9	34	STA 1 and 2
5	7	45	7	-	7	STA 1 and 2
6	15	39	10	2	21	STA 1
7	3	45	3	-	3	STA 1 and 2
8	7	43	10	20	13	STA 2
9	75	55	100	18	30	STA 96
10	20	36	10	3	33	STA 3
11	19	43	10	1	22	STA 6
12	12	35	10	20	15*	STA 7
13	9	40	6	20	15	STA 8
14	30	44	10	1	33	STA 9
15	62	44	30	1	65	STA 11
16	7	11	7	20	10	STA 12
17	8	50	30	1	6	STA 12 and 13
18	7	28	5	20	10*	STA 13
19	9	37	4	20	15*	STA 13
20	8	30	4	20	10*	STA 14
21	1	45	1	-	1	STA 14
22	9	40	6	20	10*	STA 14
23	4	44	4	20	5	STA 14
24	10	53	30	3	7	STA 15
25	21	44	10	1	22	STA 15
26	40	46.5	60	20	10*	STA 15
27	39	40	15	20	45*	STA 15 and 16
28	20	40.5	10	1	25	STA 16 and 17
29	20	45<	10	1	25	STA 17
30	3	10	1	20	15	STA 17 and 18
31	24	45	24	-	24	STA 19
32	15	43	8	20	20*	STA 20
33	9	38	10	20	20*	STA 21
34	3.5	45	3.5	-	3.5	STA 22
35	24	55	30	10	10	STA 23
36	8	45	8	-	8	STA 24
37	3	-	3	-	3	STA 24
38	16	59	30	6	7	STA 24
39	9	-	9	-	9	STA 24
40	9	45	9	-	9	STA 27

* The Resistivity value of the second layer is inferred from the nearby elcectric resistivity sounding spots.

Table 3.1.3 POPULATION, NUMBER OF HOUSES OCCUPIED AND AVERAGE NUMBER OF INHABITANTS PER HOUSE, 1974 AND 1988 CENSUSES

Department & Municipality	Population (persons)		Number of Houses		Increase Rate per Annum(%)	Average Number of Persons per House	
	1974	1988	1974	1988		1974	1988
Honduras	2,656,948	4,376,839	463,004	809,263	4.07	5.74	5.41
Department in Region-2							
1. Department Comayagua	136,619	238,790	23,362	42,296	4.33	5.85	5.65
2. Department La Paz	66,046	105,996	11,375	18,485	3.53	5.81	5.73
3. Department Intibuca	81,815	123,512	14,243	21,204	2.88	5.74	5.82
Total	284,480	468,298	48,980	81,985	3.75	5.81	5.71
Municipalities in Study Area							
1. Municipality Comayagua	30,760	59,534	5,231	10,931	5.41	5.88	5.45
2. Municipality Ajuterique	5,126	6,803	846	1,227	2.69	6.06	5.54
3. Municipality Humuya	601	1,371	108	244	5.99	5.56	5.62
4. Municipality Lamani	2,850	3,572	482	664	2.31	5.91	5.38
5. Municipality Lejamani	2,127	3,123	355	536	2.99	5.99	5.83
6. Municipality San Sebastian	1,527	1,506	247	286	1.05	6.18	5.27
7. Municipality Villa de San Antonio	6,169	11,429	1,152	2,123	4.46	5.36	5.38
8. Municipality La Paz	11,775	19,900	1,938	3,398	4.09	6.08	5.86
9. Municipality Comayagua	1,370	1,937	264	405	3.10	5.19	4.78
Total	62,305	109,175	10,623	19,814	4.55	5.87	5.51

Source : Poblacion y Vivienda por Departamento y Municipio, Censo 1974 y Censo 1988 Planificacion, Coordinacion y Presupuesto.

Table 4.1.1 (2) FIELD DATA AND ANALYSIS RESULTS OF VLF EXPLORATION (2/3)

Spot	Field Data		The First Layer		The 2nd Lay.	
No.	Appa.OHM	Angle(°)	Resist.(ohm)	Thick.(m)	Resist.(ohm)	Loc. of neaby ES STA.
41	15	40	10	2	20	STA 28
42	20	48	30	4	15	STA 29
43	11	45	11	-	11	STA 30
44	12	40	10	4	17	STA 33
45	10	33	2	20	22*	STA 35
46	4	-	4	-	4	STA 36
47	8	42	8	10	18	STA 36
48	11	40	10	10	16	STA 37
49	12	44	10	10	13	STA 37
50	15	40	7	10	15	STA 37
51	16	40	7	10	16	STA 37
52	9	44	7	10	8	STA 40
53	10	40	10	10	16	STA 41
54	23	40	7	10	25*	STA 42
55	21	38	10	1	30	STA 46
56	20	39	10	2	25	STA 47
57	4	40	4	10	7	STA 47
58	10	33	4	7	16	STA 47
59	43	45	43	-	43	STA 48
60	8	-	8	-	8	STA 48
61	17	35	5	20	15*	STA 49
62	4	48	4	20	3	STA 50
63	19	45	19	-	19	STA 51
64	14	44	10	1	16	STA 52
65	9	38	7	10	18	STA 53
66	11	44	10	10	12	STA 54
67	20	40	10	2	25	STA 55
68	9	40	5	10	14*	STA 59
69	30	40	9	10	35*	STA 59'
70	19	48	30	4	15	STA 60
71	40	59	300	6	24	
72	41	38	9	20	50*	STA 61
73	21	45	21	-	21	STA 61
74	38	50	100	4	32	STA 61
75	20	40	10	2	26	STA 63
76	45	39	4	20	50*	STA 65
77	22	44	10	1	23	STA 66
78	20	33	10	2	30*	STA 91
79	10	30	2	20	20*	STA 68
80	10	40	10	8	18	STA 68

* The Resistivity value of the second layer is inferred from the nearby elcectric resistivity sounding spots.

Table 4.1.1 (3) FIELD DATA AND ANALYSIS RESULTS OF VLF EXPLORATION (3/3)

Spot No.	Field Data		The First Layer		The 2nd Lay.	
	Appa.OHM	Angle(°)	Resist.(ohm)	Thick.(m)	Resist.(ohm)	Loc. of neaby ES STA.
81	23	30	10	4	60	STA 68
82	9	41	8	10	17	STA 69
83	13	39	10	7	22	STA 69
84	8	31	2	2	15*	South of Cane
85	8	31	2	2	15*	STA 73
86	10	36	8	10	24	STA 74
87	17	55	20	2	12	STA 75
88	28	35	8	3	45	STA 75
89	70	45	70	-	70	STA 76
90	25	38	10	1	35	STA 76 and 77
91	30	44	10	1	32	
92	33	43	10	1	35	STA 77
93	19	36	10	2	30	STA 77 and 78
94	38	46	10	2	37	STA 78
95	32	47	20	2	30	STA 78 and 79
96	24	35	10	2	37*	STA 79
97	40	40	10	1	50	STA 79 and 80
98	29	47	30	20	27	STA 80
99	16	40	10	1	21	STA 81
100	9	40	8	20	20*	STA 81
101	15	39	10	1	22	STA 71
102	15	45	15	-	15	STA 71
103	7	43	7	10	13	STA 83
104	11	47	11	10	12	STA 83
105	19	44	10	1	20	STA 84
106	20	45	20	-	20	STA 86
107	16	40	10	1	21	STA 87
108	16	44	10	1	17	STA 88
109	22	45	22	-	22	STA 89
110	10	30	2	20	20*	STA 89
111	38	45	38	-	38	STA 89

* The Resistivity value of the second layer is inferred from the nearby elcectric resistivity sounding spots.

Table 4.1.2 SUMMARY OF THE SEQUENCE OF RESISTIVITY LAYERS

Layer	Thickness (in meter)	Resistivity (in ohm-m)	Assumed Geological Condition	Relation to Hydrogology	Typical Profile
Layer 1	0 to 30	15 to 135*	Above ground water level, the upper part of the Layer 4. Mainly sand/gravels with silt or clay of thinly intercalated.	No ground water through year. Highly permeable.	E, F, G, H, VI,VII,VIII
		11 to 81*	Above ground water level, the upper part of the Layer 2, 3. Mainly sandy silt and sand with thin clay intercalated.	do.	K, L, M, N, O, III, IV, V
Layer 2	0 to 60 (Ave. 30)	7 to 54* (Ave. 20)	Below ground water level. Sand and gravel in the margin of the basin. Sand/silt in the center of the basin. Mainly the fan deposits	Aquifer "Fair"	A, B, C, D, E, F, G, H, I, J, K, L, VI,VII,VIII
Layer 3	0 to 50 (Ave. 40, Max.120 near Cane)	1 to 15* (Ave. 3)	Maily clay and silty clay. Partly silty sand or sand at the southern area of Villa de San Antonio, 5km far away. Well developped thickly at the western area of Cane.	Aquiclude. Locally aquitard. At southern area of Villa de San Antonio	I, J, K, L, M, I, II, III
Layer 4	30 to 120 (Ave. 80)	7 to 18* (Ave. 10)	Mainly fine, well consolidated sand. Corse sand in the margin of the basin. Extremely thick in the east side of the basin.	Semi-aquifer "Good"	III, IV, V, VI,VII,VIII O, P
4(a)	about 30	12 to 70	In the southern parts of the basin, shown on Prof. O & P, the Layer 4 can be subdivided into the such three layers as 4(a), 4(b) and 4(c).		
4(b)	about 60	7 to 30			
4(c)	about 30	9 to 16			
Layer 5	60 to 80 (Ave. 70)	2 to 6* (Ave. 4)	Mainly clay and clayey silt. Silt develops in the margin of the basin.	Aquiclude	E, F, H, J , K
	do.	4 to 10* (Ave. 6)	Mainly clayey silt, partly sandy silt in the margin of the basin.	Aquiclude,partly aquitard.	do.
Basement		15 to 45 (Ave. 20)	Welded tuff of Tertiary age	Impermeable	A, B, C, D, E, I, O, P, Q
		27 to 110	Sedimentary rocks or granodiorite of Mesozoic age.	do.	do.

* Some exceptional high or low values in extremely thin intercalated layer are neglected.

Table 4.1.3 DRILLING RESULT OF OBSERVATION HOLES AND TEST WELLS

No.	Location	Well No.	Drill Depth *1	Casing Depth *2	Distance b/w OH & TW	Height Dif. *3 b/w OH & TW
1	Las Liconas	OH-1	100 m	67 m	18.50 m	+ 0.04 m
		TW-1	73	72		
2	San Nicolas	OH-2	130	127	15.40	+ 0.25
		TW-2	127	124		
3	Yarumela	OH-3	100	86	22.30	- 1.63
		TW-3	90	90		
4	Flores	OH-4	120	115	15.10	- 0.22
		TW-4	115	115		
5	Lamani	OH-5	120	120	17.00	+ 0.15
		TW-5	100	95		
	TOTAL	OH	570			
		TW	505			

*1. Drill Dia. ; Observation Holes ... 10 inches
Test Wells ..... 14-3/4 inches

*2. Casing Dia.; Observation Holes ... 4 inches
Test Wells ..... 8 inches

*3. Height Dif.; Difference between casing top elevations of a test well and a observation hole, i.e.
(El. of OH) - (El. of TW)

Table 4.1.4 DRILLING OPERATION TIMES FOR OBSERVATION HOLES AND TEST WELLS

(Unit : day)

Location	Las Liconas		San Nicolas		Yarumela		Flores		Lamani	
Well No.	OH-1	TW-1	OH-2	TW-2	OH-3	TW-3	OH-4	TW-4	OH-5	TW-5
Drill Depth (m)	100	73	130	127	100	90	120	115	120	100
Casing Depth (m)	67	72	127	124	86	90	115	115	120	95
Operation Items										
A. Site preparation, transport and installation of drilling rig	0.5	3	4	2	4	2	1	1	2	1
B. Drilling operation, logging investigations, parmanent casing & screens installation	9	13	31	23	7	13	6	7	17	17
C. Gravel Packing and development	3.5	3	8	4	2	5	5	5	5	5
D. Clay and mortar filling, construction of basement	0.5	1	1	1	1	1	1	1	1	1
E. Recovery work for accident	0	0	0	0	0	0	0	0	7	0
F. Disassembly and removal of drilling rig	0.5	1	1	1	1	1	1	1	1	1
G. Waiting time and holiday (no work due to heavy rain)	3	7	19 (3)	33	0	61	44	37	34	41
H. Total days	17	28	63	64	15	83	58	52	67	66
I. Actual operation days (H - E - G)	14	21	44	31	15	22	14	15	33	25

Table 4.1.5 QUANTITY OF INSTALLED CASING PIPES AND SCREENS

No.	Location	Well No.	Spec. of Casing Pipes and Screens: Dia. (inch)	Depth (m)	Screen Position (m - m)	PVC pipes: blind (m)	slotted (m)	total (m)	steel pipes: blind (m)	slotted (m)	wire-wrapped (m)	total (m)
1	Las Liconas	OH-1	4	67	21-32, 35-38, 54-62	45	22	67	-	-	-	-
		TW-1	8	72	20-26, 35-41, 53-59, 63-69	-	-	-	48	-	24	72
2	San Nicolas	OH-2	4	127	12-18, 23-29, 58-63, 90-96, 113-125	-	-	-	92	35	-	127
		TW-2	8	124	12-18, 26-32, 52-55, 61-64, 93-105, 118-123	89	35	124	-	-	-	-
3	Yarumela	OH-3	4	86	15-33, 42-48, 73-76	59	27	86	-	-	-	-
		TW-3	8	90	12-34, 38-41, 46-49, 61-67, 87-90	-	-	-	53	-	37	90
4	Flores	OH-4	4	115	17-20, 43-46, 58-64, 73-76, 81-82.5, 90-91.5, 101-113	-	-	-	85	30	-	115
		TW-4	8	115	18-21, 44-47, 58-61, 73-76, 79-82, 90-93, 101-113	-	-	-	85	-	30	115
5	Lamani	OH-5	4	120	21-43, 76-80, 84-90, 113-119	-	-	-	82	38	-	120
		TW-5	8	95	29-37, 40-43, 58-61, 76-91	66	29	95	-	-	-	-
	TOTAL	OH	4	-	------	104	49	153	259	103	-	362
		TW	8	-	------	155	64	219	186	-	91	277

Table 4.1.6 (1) PUMPING TEST RESULTS OF NEWLY DRILLED TEST WELLS (1/3)

Location	Test	Test Well Q(l/s)	Test Well Sw(m)	Test Well SC(l/s.m)	Observ.Hole Sw (m)
Las Liconas	(S.W.L)		(2.85)		(2.63)
TW-1	Step Draw-	0.5	8.46	0.06	2.03
&	down Test	0.9	20.68	0.04	4.88
OH-1		1.1	27.87	0.04	7.77
	Continuous Pump. Test	0.7	21.88	0.03	7.17
San Nicolas	(S.W.L)		(7.10)		(7.33)
TW-2	Step Draw-	4.0	2.23	1.79	1.20
&	down Test	6.0	3.83	1.57	1.86
OH-2		8.0	5.94	1.35	2.80
		10.0	7.77	1.29	3.78
	Continuous Pump. Test	7.0	7.39	0.95	4.65
Yarumela	(S.W.L)		(8.83)		(7.38)
TW-3	Step Draw-	2.0	2.37	0.84	0.66
&	down Test	4.0	5.48	0.73	0.76
OH-3		6.2	9.11	0.68	2.05
		8.7	16.00	0.54	2.66
		11.8	31.81	0.37	2.86
	Continuous Pump. Test	6.2	14.35	0.43	2.70
Flores	(S.W.L)		(11.00)		(11.00)
TW-4	Step Draw-	5.0	2.08	2.40	0.55
&	down Test	7.4	2.91	2.54	0.93
OH-4		10.0	4.13	2.42	1.37
		13.0	5.60	2.32	1.92
	Continuous Pump. Test	12.0	6.56	1.83	3.08
Lamani	(S.W.L)		(35.61)		(35.60)
TW-5	Step Draw-	3.5	1.02	3.43	0.29
&	down Test	5.0	1.81	2.76	0.50
OH-5		7.5	2.45	3.06	0.81
		8.8	2.92	3.01	0.97
	Continuous Pump. Test	6.0	1.69	3.55	0.40

Remarks; Q : Discharge rate
Sw: Drawdown
SC: Specific capacity
S.W.L. : Static Water Level

Table 4.1.6 (2) PUMPING TEST RESULTS OF NEWLY DRILLED TEST WELLS (2/3)

Location	Transmissivity (m^2/day) Test Well CPT*1	Test Well RT*2	Observ. Hole CPT*1	Observ. Hole RT*2	Avg.	Pumping Rate (l/s)	Final Draw Down (m) Test Well	Final Draw Down (m) Observ. Hole	Radius of Infuluence (m)	Aquifer Loss of Pumping Well (m)	Well Loss Drawdown (m)	Well Loss (%)
1. Las Liconas	2.64	3.11	1.15	1.98	2.22	0.7	21.88	7.17	98	21.88*3	0.00	0
2. San Nicolas	83.23	127.24	61.50	106.44	94.60	7.0	7.39	4.65	1,495	7.39*3	0.00	0
3. Yarumela	91.63	131.12	26.22	89.95	84.73	6.2	14.35	2.70	328	8.14	6.21	44
4. Flores	231.42	267.27	253.02	287.52	259.81	12.0	6.56	3.08	1,939	6.27	0.29	5
5. Lamani	247.09	263.56	152.05	168.23	207.73	6.0	1.69	0.40	47	1.69*3	0.00	0

Remarks. *1 : Continuous Pumping Test *2 : Recovery Test
*3 : Since Calculated value is larger than the observed drawdown, it is supposed that whole the drawdown was cuased only by the aquifer loss.

Table 4.1.6 (3) PUMPING TEST RESULTS OF NEWLY DRILLED TEST WELLS (3/3)

Location	Result of Pumping: Pumping Rate(l/s)	WL of TW*1: SWL(m)	WL of TW*1: PWL(m)	Transmissivity average (m^2/day)	Total Screen Length (m)	Hydraulic Conductivity (cm/sec)	Hydrogeological Condition: Type of Main Aquifer	Ratio of Sand Layer*2: Shallow G/W	Ratio of Sand Layer*2: Deep G/W
1. Las Liconas	0.7	3.78	25.66	2.22	24.0	1.07×10^{-4} (0.093 m/day)	Artesian G/W (Deep G/W)	70% (10m)	20% (90m)
2. San Nicolas	7.0	7.08	14.47	94.60	35.0	3.13×10^{-3} (2.703 m/d)	do.	80 (33.5)	20 (116.5)
3. Yarumela	6.2	8.95	23.30	84.73	37.0	2.65×10^{-3} (2.29 m/d)	Phereatic G/W (Shallow G/W)	74 (33.5)	20 (56.5)
4. Flores	12.0	11.06	17.62	259.81	30.0	1.00×10^{-2} (8.660 m/d)	Artesian G/W (Deep G/W)	60 (25.0)	55 (90.0)
5. Lamani	6.0	35.67	37.36	207.73	29.0	8.29×10^{-3} (7.163 m/d)	do.	65 (50.0)	40 (50.0)

Remarks. *1 : WL = Water Level, TW = Test Well, SWL = Static Water Level, PWL = Pumping Water Level
*2 : Values in parentheses are the total thicknesses of each aquifer confirmed through the well drilling.

Table 4.1.7 PUMPING TEST RESULTS OF PREVIOUSLY DRILLED WELLS

Well No.	Location	Depth (m)	Position of Screen (m)	Pumping Rate(l/s)	SWL* (m)	Transmissivity(m^2/day)	Permeability (cm/sec)
No. 2; Well in CEDA	CEDA (Comayagua)	50	27 to 50	9.8	20	56	2.8×10^{-3}
Site A1; Test Well of SANAA	La Paz	30.5	12 to 30	11.0	-	23	1.5×10^{-3}
A-1-3; Test Well of SANAA	Los Mangos	38	24 to 38	7.3	16	32	2.7×10^{-3}
A-1-4; Test Well of SANAA	Los Mangos	58	?	8.5	17	26	-
No. 4; Tested in F/S, 1972	El Alamo (4km east from San Sebastian)	?	?	12.4	20	31	-
Tested in F/S, 1972	Palo Verde (4km south from San Sebastian)	?	?	5.7	20	19	-

Table 4.1.8 (1) TEMPERATURE AND ELECTRIC CONDUCTIVITY OF SURFACE/GROUND WATER (1/4)

LOCATION NO. or WELL NO.	March, 1988 Temp. (°C)	March, 1988 EC (M.S/cm)	June, 1988 Temp. (°C)	June, 1988 EC (M.S/cm)	February, 1989 Temp. (°C)	February, 1989 EC (M.S/cm)
R-1	23.0	1,000.0	-	-	-	-
R-4	24.0	720.0	29.0	820.0	-	-
R-5	24.0	230.0	22.0	160.0	22.0	160.0
R-6	24.0	720.0	-	-	-	-
R-8	22.5	320.0	-	-	22.0	190.0
R-10	31.0	320.0	-	-	-	-
R-11	29.0	360.0	-	-	-	-
R-12	25.5	130.0	-	-	-	-
R-13	24.0	90.0	-	-	-	-
R-14	-	-	27.0	66.0	27.0	66.0
R-15	-	-	23.0	52.0	-	-
R-16	25.0	200.0	22.5	63.0	-	-
R-19	27.0	74.0	25.0	47.0	25.0	47.0
R-21	32.0	150.0	22.5	100.0	-	-
R-22	24.0	74.0	-	-	-	-
R-24	28.0	180.0	-	-	-	-
R-25	27.0	110.0	26.5	46.0	26.5	46.0
R-40	-	-	26.0	170.0	-	-
R-41	-	-	24.0	130.0	-	-
R-42	-	-	24.0	74.0	-	-
R-43	25.5	640.0	-	-	-	-
R-44	24.0	90.0	25.0	43.0	25.0	43.0
R-45	28.5	230.0	-	-	-	-

Table 4.1.8 (2) TEMPERATURE AND ELECTRIC CONDUCTIVITY OF SURFACE/GROUND WATER (2/4)

LOCATION NO. or WELL NO.	March, 1988 Temp. (°C)	March, 1988 EC (M.S/cm)	June, 1988 Temp. (°C)	June, 1988 EC (M.S/cm)	February, 1989 Temp. (°C)	February, 1989 EC (M.S/cm)
1	26.5	340.0	-	-	-	-
2	26.5	150.0	27.0	220.0	25.0	160.0
3	29.5	670.0	26.5	385.0	-	-
4	29.0	480.0	29.0	500.0	27.0	460.0
5	no water		28.0	820.0	27.0	750.0
6	29.5	1,100.0	29.5	1,100.0	-	-
7	26.5	940.0	-	-	-	-
8	26.5	350.0	29.0	380.0	28.0	340.0
9	29.0	600.0	29.0	610.0	28.5	580.0
10	29.5	450.0	-	-	-	-
11	26.0	200.0	25.5	200.0	25.0	280.0
12	29.0	130.0	-	-	-	-
13	26.5	830.0	-	-	25.0	780.0
14	24.5	420.0	23.5	430.0	-	-
15	27.5	170.0	27.0	160.0	26.0	180.0
16	29.5	500.0	27.5	470.0	26.0	440.0
17	29.5	1,200.0	-	-	-	-
18	30.0	600.0	29.0	590.0	29.0	570.0
19	28.5	680.0	29.0	640.0	26.0	650.0
21	26.0	460.0	-	-	-	-
22	25.0	160.0	-	-	-	-
23	28.0	420.0	-	-	26.5	440.0
26	28.5	800.0	27.0	760.0	25.0	730.0
28	28.5	300.0	25.5	270.0	26.0	380.0
29	28.5	3,500.0	28.0	3,300.0	26.0	3,800.0
30	27.5	2,000.0	28.5	1,700.0	27.0	2,000.0
31	-	-	-	-	27.0	800.0
32	27.0	700.0	26.0	710.0	29.0	730.0
33	28.0	260.0	28.5	220.0	28.0	140.0

Table 4.1.8 (3) TEMPERATURE AND ELECTRIC CONDUCTIVITY OF SURFACE/GROUND WATER (3/4)

LOCATION NO. or WELL NO.	March, 1988 Temp. (°C)	March, 1988 EC (M.S/cm)	June, 1988 Temp. (°C)	June, 1988 EC (M.S/cm)	February, 1989 Temp. (°C)	February, 1989 EC (M.S/cm)
35	28.5	4,900.0	28.5	4,200.0	26.0	2,800.0
36	27.0	1,200.0	-	-	-	-
39	-	-	26.5	200.0	26.0	300.0
45	-	-	29.0	330.0	-	-
51	-	-	27.0	540.0	26.0	270.0
53	-	-	28.5	600.0	26.5	550.0
63	-	-	30.0	700.0	29.0	730.0
68	-	-	27.0	950.0	25.0	850.0
76	-	-	27.0	210.0	26.0	170.0
81	-	-	28.0	600.0	26.0	460.0
84	-	-	26.5	180.0	26.0	160.0
87	-	-	28.5	410.0	26.0	330.0
88	-	-	-	-	26.0	440.0
89	-	-	24.5	260.0	24.0	520.0
91	-	-	25.0	100.0	24.0	100.0
92	-	-	26.0	180.0	26.0	140.0
95	-	-	-	-	26.5	390.0
97	-	-	27.0	640.0	28.0	700.0
101	-	-	27.5	570.0	26.0	560.0
104	-	-	-	1,025.0	-	-
109	-	-	28.0	920.0	25.0	750.0
122	-	-	29.0	835.0	26.0	950.0
123	-	-	29.0	425.0	25.0	720.0
126	-	-	27.5	980.0	-	-
129	-	-	26.5	1,000.0	26.0	900.0
131	-	-	26.5	730.0	26.5	700.0
134	-	-	-	720.0	26.0	510.0
136	-	-	-	950.0	27.5	820.0
141	-	-	27.0	660.0	-	-

Table 4.1.8 (4) TEMPERATURE AND ELECTRIC CONDUCTIVITY OF SURFACE/GROUND WATER (4/4)

LOCATION NO. or WELL NO.	March, 1988 Temp. (°C)	March, 1988 EC (M.S/cm)	June, 1988 Temp. (°C)	June, 1988 EC (M.S/cm)	February, 1989 Temp. (°C)	February, 1989 EC (M.S/cm)
142	-	-	31.0	1,000.0	-	-
149	-	-	24.5	800.0	28.0	900.0
150	-	-	26.0	500.0	24.5	500.0
151	-	-	28.0	420.0	-	-
154	-	-	30.0	460.0	31.0	460.0
158	-	-	-	-	26.0	940.0
161	-	-	27.0	540.0	-	-
165	-	-	28.0	440.0	29.0	450.0

Table 4.1.9 (1) INVENTRY OF THE EXISTING WELLS IN THE COMAYAGUA BASIN (1/9)

WELL NO.	LOCATION (COMUNITY NAME)	DATE OF CONDTRUCTION (month / year)	OWNER	CONDITION OF UTILIZATION PURPOSE OF USAGE	BENEFICIARY HOUSES	BENEFICIARY POPULATION	PUMPING RATE (M3/DAY)	SPECIFICATION OF THE WELL CLASSIFICATION	DIAMETER (cm) INSIDE	DIAMETER (cm) OUTSIDE	DEPTH (m)	POSITION OF SCREEN m - m	SPECIFICATION OF PUMPING FACILITY CLASIFICATION	INSTALLED DEPTH (m)	MAX. CAPACITY (M3/DAY)	COLUM. DIA. (mm)
1	BARRIO PIEDRAS BONITAS	/ 1984	COMUNITY	DRINK, DOMESTIC	50	300		DUG WELL	200	280	16	-	HAND PUMP			
2	DO.	4 / 1987	DO.	DRINK, DOMESTIC, IRRIGATION	17	90		DO.	130	180	7	-	DO.			
3	COMAYAGUA	/ 1987	HOSPITAL	DOMESTIC				TUBE WELL (PVC)		20	48	-	SUBMERS. MOTOR PUMP	38	260	50
4	TENGUAJE	/ 1982	COMUNITY	DRINK, DOMESTIC	3	20		DUG WELL	150	225	5	-	HAND PUMP			
5	SAN ISIDRO	/ 1982	PRIVATE	DO.		7		DO.	170	260	9	-	DO.			
6	LAS VEGAS	/	PRIVATE	DO.	1	5		DO.	140	180	13	-	TURBINE PUMP	12.5	?	40
7	PARMEROLA	/ 1984	COMUNITY	DO.	8	50		DO.	110	180	12	-	HAND PUMP			
8	SAN NICOLAS	/ 1975	DO.	DO.	80	480		DO.	220	290	9	-	DO.			
9	HOGAR ESPERANSA	/	COMUNITY	NO USE				DO.	130	170	14	-	DO.			
10	LAS PALILLOS	/ 1982	DO.	DRINK	60	360		DO.	150	190	27	-	DO.			
11	LOS MANGOS	/ 1983	COMUNITY	DRINK, DOMESTIC	5	30		DUG WELL	140	170	6	-	HAND PUMP			
12	SAN JOSE DEL PUENTE	/ 1984	DO.	DO.	4	24		DO.	?	220	?	-	DO.			
13	LAS FLORES	/ 1981	PRIMARY SCHOOL	DOMESTIC				DO.	120	165	3	-	DO.			
14	FINCA GLORIA	/ 1985	PRIVATE	DRINK, DOMESTIC	2	5		DO.	90	165	9	-	DO.			
15	LOS PINTORES	/ 1984	DO.	DO.	1	8		DO.	160	200	18	-	DO.			
16	AGUA SALADA	/ 1979	COMUNITY	DO.	4	24		DO.	120	160	8	-	DO.			
17	VILLA DE SAN ANTONIO	/ 1978	DO.	DO.		?		DO.	?	160	14	-	DO.			
18	EL COQUITO	/ 1981	DO.	DO.	30	80		DO.	140	210	20	-	DO.			
19	PALOS BLANCOS	/ 1985	DO.	DO.	6	50		DO.	90	170	5	-	DO.			
20	LOS OBANDOS	2 / 1988	PRIMARY SCHOOL	DO.		?		DO.	?		>10	-	DO.			

Table 4.1.9 (2) INVENTRY OF THE EXISTING WELLS IN THE COMAYAGUA BASIN (2/9)

WELL NO.	LOCATION (COMUNITY NAME)	DATE OF CONDTRUCTION (month / year)	OWNER	CONDITION OF UTILIZATION PURPOSE OF USAGE	BENEFICIARY HOUSES	BENEFICIARY POPULATION	PUMPING RATE (M3/DAY)	SPECIFICATION OF WELL CLASSIFICATION	DIAMETER (cm) INSIDE	DIAMETER (cm) OUTSIDE	THE WELL DEPTH (m)	POSITION OF SCREEN m - m	SPECIFICATION OF PUMPING FACILITY CLASIFICATION	INSTALLED DEPTH (m)	MAX. CAPACITY (M3/DAY)	COLUM. DIA. (mm)
21	YARUMELA	/	COMUNITY (SANAA)	DRINK, DOMESTIC		2345	326	TUBE WELL (STEEL)		20	?	-	SUBMERS. MOTOR PUMP	?	?	100
22	EL PORVENIR	/ 1986	COMUNITY	NO USE				DUG WELL	120	180	2	-				
23	EL PAJONAL	/ 1983	DO.	NO USE				DO.	120	160	13	-				
24	CEDA	/	CEDA	DOMESTIC		?		TUBE WELL (PVC)		25	50	27 - 50	SUBMERS. MOTOR PUMP	?	?	
25	DO.	/	DO.	DO.		?		DO.		25	48	18 - 26 30 - 45	DO.	?	?	
26	ASENTAMIENTO LA ISLA	/ 1980	COMUNITY	DRINK, DOMESTIC	9	54		DUG WELL	170	240	5	-	HAND PUMP			
27	PLAYITAS	/	DO.	NO USE				TUBE WELL (PVC)		20	?	-				
28	DO.	/ 1986	DO.	DRINK, DOMESTIC	5	30		DUG WELL	140	190	9	-	HAND PUMP			
29	TERRERO	/ 1986	PRIVATE	DOMESTIC	1	7		DO.	135	185	4	-	DO.			
30	EL JARIN BARRIO ABAJO	/ 1982	COMUNITY	DRINK, DOMESTIC	6	30		DO.	130	180	6	-	DO.			
31	EL SIFON	/ 1985	COMUNITY	DRINK, DOMESTIC	3	18		DUG WELL	120	170	21.4	-	HAND PUMP			
32	COL. MATIL DE CORDOVA LEJAMANI	/ 1983	DO.	NO USE				DO.	120	170	12	-	NO FACILITY			
33	LA PAZ	/	HOSPITAL	EMERGENCY USE				TUBE WELL (PVC)		15	>50	-	SUBMERS. MOTOR PUMP	>50	?	25
34	DO.	/	COMUNITY (SANAA)	DRINK, DOMESTIC		15354		TUBE WELL (STEEL)		25	>50	-	DO.	>50	?	100
35	CANE	/	PRIVATE	DOEMSTIC		?		DUG WELL	140	190	16	-	NO FACILITY			
36	ASEUTAMIENTO MIRAVALLE	/ 1982	COMUNITY	DRINK, DOMESTIC	5	30		DO.	110	170	9	-	HAND PUMP			
37	LAS VEGAS	/	PRIVATE	NO USE				DO.	110	180	10	-	NO FACILITY			
38	PIEDRA BONITAS	/	DO.	DRINK, DOMESTIC	1	6		DO.	?	?	?	-	HAND PUMP			
39	DO.	5 / 1986	COMUNITY	DO.	3	20		DO.	110	180	14	-	DO.			
40	BARRIO 21 DE ABRIL	1 / 1986	DO.	DO.	30	200		DO.	130	180	12	-	DO.			

Table 4.1.9 (3) INVENTRY OF THE EXISTING WELLS IN THE COMAYAGUA BASIN (3/9)

WELL NO.	LOCATION (COMUNITY NAME)	DATE OF CONDTRUCTION (month / year)	OWNER	CONDITION OF UTILIZATION PURPOSE OF USAGE	BENEFICIARY HOUSES	BENEFICIARY POPULATION	PUMPING RATE (M3/DAY)	SPECIFICATION OF THE WELL CLASSIFICATION	DIAMETER (cm) INSIDE	DIAMETER (cm) OUTSIDE	DEPTH (m)	POSITION OF SCREEN m - m	SPECIFICATION OF PUMPING FACILITY CLASIFICATION	INSTALLED DEPTH (m)	MAX. CAPACITY (M3/DAY)	COLUM. DIA. (mm)
41	BARRIO 21 DE ABRIL	/ (UNDER CONSTRUCTION)	LINCOL COREMAN	DRINK, DOMESTIC		7		DUG WELL				-	NO FACILITY			
42	DO.	/	COMUNITY	DO.	8	50		DO.	130	180	18	-	HAND PUMP			
43	DO.	5 / 1988	DO.	DO.	10	50		DO.	150	190	14	-	DO.			
44	DO.	5 / 1988	DO.	NO USE				DO.	160	210	10	-	NO FACILITY			
45	BARRIO SAN RAFAEL	/	DO.	NO USE				DO.	140	190	4	-	DO.			
46	SAPOTE No 1 (TENGUAJE)	4 / 1988	DO.	DRINK, DOMESTIC	17	100		DO.	130	180	8	-	HAND PUMP			
47	TENGUAJE	/ 1982	DO.	DO.	4	24		DO.	160	200	8	-	DO.			
48	CANA No 1	/ (UNDER CONSTRUCTION)	DO.	DO.	3	20		DO.	150	210	7	-	NO FACILITY			
49	DO.	/ (UNDER CONSTRUCTION)	DO.					DO.				-	DO.			
50	CANAS	/	DO.					DO.	120	210	9	-	DO.			
51	PALMEROLA No 2 (CIRUERON)	5 / 1983	COMUNITY	DRINK, DOMESTIC	9	50		DUG WELL	120	175	18	-	DO.			
52	DO.	/ 1982	DO.	DO.	7	40		DO.	130	180	8	-	HAND PUMP			
53	PALMEROLA	/ 1982	DO.	DO.	10	60		DO.	120	175	10	-	DO.			
54	DO.	/ 1986	DO.	DO.	10	60		DO.	140	180	13	-	DO.			
55	LAS MESAS	/ (UNDER CONSTRUCTION)	DO.					DO.				-				
56	SAN NICOLAS	/	DO.	NO USE				DO.	170	220	14	-	NO FACILITY			
57	DO.	/ 1978	PRIVATE	DRINK, DOMESTIC	1	6		DO.	140	190	13	-	HAND PUMP			
58	DO.	/ (UNDER CONSTRUCTION)	COMUNITY					DO.				-				
59	DO.	/ 1978	DO.	DRINK, DOMESTIC	30	200		DO.	7	190	7	-	HAND PUMP			
60	DO.	/ (UNDER CONSTRUCTION)	DO.					DO.				-				

Table 4.1.9 (4) INVENTRY OF THE EXISTING WELLS IN THE COMAYAGUA BASIN (4/9)

WELL NO.	LOCATION (COMUNITY NAME)	DATE OF CONDTRUCTION (month / year)	OWNER	CONDITION OF UTILIZATION PURPOSE OF USAGE	BENEFICIARY HOUSES	BENEFICIARY POPULATION	PUMPING RATE (M3/DAY)	CLASSIFICATION	SPECIFICATION DIAMETER (cm) INSIDE	DIAMETER (cm) OUTSIDE	THE WELL DEPTH (m)	POSITION OF SCREEN m - m	SPECIFICATION OF PUMPING FACILITY CLASIFICATION	INSTALLED DEPTH (m)	MAX. CAPACITY (M3/DAY)	COLUN. DIA. (mm)
61	PARMELORA	12 / 1987	COMUNITY	DRINK, DOMESTIC	5	30		DUG WELL	130	180	8	- -	HAND PUMP			
62	HOGAR ESPERANSA	/ 1984	DO.	DRINK, DOMESTIC, IRRIGATION	40	300	40	TUBE WELL (PVC)		15	70	- -	SUBMERS. MOTOR PUMP	48	?	50
63	DO.	/		NO USE				DO.		15	40	- -	NO FACILITY			
64	DO.	/ 1984	COMUNITY	DRINK, DOMESTIC	16	112	?	DO.		15	?	- -	SUBMERS. MOTOR PUMP	?	?	25
65	DO.	/		NO USE				DUG WELL	160	210	16	- -				
66	DO.	/		NO USE				DO.	140	185	17	- -				
67	EL COQUITO	/ 1984		NO USE				TUBE WELL (PVC)		20	?	- -				
68	DO.	/ 1975	COMUNITY	DOMESTIC	30	180		DUG WELL	110	170	6	- -	HAND PUMP			
69	DO.	/ 1985	DO.	DRINK, DOMESTIC	30	180	?	TUBE WELL (PVC)		20	?	- -	SUBMERS. MOTOR PUMP	?	?	100
70	DO.	/	PRIVATE (FARM)	DO.				DO.		20	?	- -	DO.	?	?	100
71	EL COQUITO	/ 1984	PRIVATE	DRINK, DOMESTIC	2	15		DUG WELL	170	220	8	- -	HAND PUMP			
72	DO.	/ 1983	COMUNITY	DOMESTIC	40	240		DO.	150	240	7	- -	DO.			
73	DO.	/ 1985	DO.	DRINK, DOMESTIC	60	400		DO.	150	200	?	- -	DO.			
74	DO.	/ (UNDER CONSTRUCTION)						DO.				- -				
75	DO.	/ (UNDER CONSTRUCTION)						DO.				- -				
76	DO.	/ 1987	PRIVATE	DRINK, DOMESTIC, IRRIGATION	1	6		DO.	135	180	15	- -	HAND PUMP			
77	LOS OBANDOS	5 / 1987	DO.	DRINK, DOMESTIC		?		DO.		180	?	- -	DO.			
78	DO.	/ (UNDER CONSTRUCTION)	COMUNITY	DO.	15	80		DO.				- -				
79	VILLA DE SAN ANTONIO	/ 1978	DO.	DO.	500	?		DO.	180	220	19	- -	HAND PUMP			
80	DO.	/ 1978	DO.	DO.	20	120		DO.		160	?	- -	DO.			

Table 4.1.9 (5) INVENTRY OF THE EXISTING WELLS IN THE COMAYAGUA BASIN (5/9)

WELL NO.	LOCATION (COMUNITY NAME)	DATE OF CONOTRUCTION (month / year)	OWNER	CONDITION OF UTILIZATION PURPOSE OF USAGE	BENEFICIARY HOUSES	BENEFICIARY POPULATION	PUMPING RATE (M3/DAY)	CLASSIFICATION	SPECIFICATION OF THE WELL DIAMETER (cm) INSIDE	DIAMETER (cm) OUTSIDE	DEPTH (m)	POSITION OF SCREEN m - m	SPECIFICATION OF PUMPING FACILITY CLASIFICATION	INSTALLED DEPTH (m)	MAX. CAPACITY (M3/DAY)	COLUM. DIA. (mm)
81	VILLA DE SAN ANTONIO	/ 1978	PRIVATE	DRINK, DOMESTIC	1	6		DUG WELL	130	180	14	-	TURBINE PUMP			
82	DO.	/ 1978	COMUNITY	DO.	40	?		DO.	140	170	16	-	HAND PUMP			
83	LOS MANGOS	/ 1983	PRIVATE	DO.	1	8		DO.	150	195	7	-	DO.			
84	SAN JOSE DE PUENTE	/ 1978	COMUNITY	DO.	3	18		DO.	115	160	12	-	DO.			
85	DO.	/	DO.	NO USE				DO.	130	185	5	-	DO.			
86	DESVIO LA VILLA	/ 1983	DO.	DRINK, DOMESTIC	10	60		DO.	130	180	8	-	DO.			
87	BARRIO LA CURRA (LAS FLORES)	/ 1981	DO.	DO.	50	300		DO.	130	160	4	-	DO.			
88	DO.	1 / 1987	DO.	DO.	3	18		DO.	140	200	3	-	DO.			
89	HACIENDA SANTA IZABEL	/ 1982	DO.	DO.	4	25		DO.	7	220	?	-	DO.			
90	HACIENDA SANTA TERESA	/ 1986	PRIVATE	DRINK, DOMESTIC, IRRIGATION	2	9	RAIN:150 DRY: 50	TUBE WELL (PVC)		15	60	-	SUBMERS. MOTOR PUMP	?	600	40
91	HACIENDA SANTA TERESA	/	PRIVATE	NO USE				DUG WELL	160	190	6	-	NO FACILITY			
92	HACIENDA SANTA MARIA	2 / 1988	DO.	DRINK, DOMESTIC, IRRIGATION	4	24		TUBE WELL (PVC)		10	45	-	SUBMERS. MOTOR PUMP	?	?	40
93	HACIENDA JICARAL	1 / 1988	DO.	DO.	2	4	100	TUBE WELL (PVC)		10	?	-	DO.	?	400	40
94	LA PLAZUERA	/ 1978	COMUNITY	NO USE				DUG WELL	130	170	17	-	NO FACILITY			
95	DO.	/ 1981	DO.	DRINK, DOMESTIC	5	30		DO.	120	145	19	-	HAND PUMP			
96	CANE	/	DO.	NO USE				DO.	70	150	4	-	NO FACILITY			
97	SAN SEBASTIAN	/ 1979	DO.	DOMESTIC	60	360		DO.	130	180	14	-	HAND PUMP			
98	DO.	/	DO.	NO USE				DO.			7	-	NO FACILITY			
99	AGUA SALADA	/ 1987	DO.	DRINK, DOMESTIC	5	30		DO.	190	250	10	-	HAND PUMP			
100	IVAN BETANCOUR	/ 1987	DO.	DO.	5	30		DO.				-	HAND PUMP			

Table 4.1.9 (6) INVENTRY OF THE EXISTING WELLS IN THE COMAYAGUA BASIN (6/9)

WELL NO.	LOCATION (COMUNITY NAME)	DATE OF CONOTRUCTION (month / year)	OWNER	CONDITION OF UTILIZATION PURPOSE OF USAGE	BENEFICIARY HOUSES	BENEFICIARY POPULATION	PUMPING RATE (M3/DAY)	WELL CLASSIFICATION	SPECIFICATION DIAMETER (cm) INSIDE	DIAMETER (cm) OUTSIDE	THE DEPTH (m)	POSITION OF SCREEN m - m	SPECIFICATION OF PUMPING FACILITY CLASIFICATION	INSTALLED DEPTH (m)	MAX. CAPACITY (M3/DAY)	COLUN. DIA. (mm)
101	SECCION MATERIAL VEGITATINO RR-NN	/ 1985	COMUNITY	DRINK, DOMESTIC	10	80		DUG WELL	130	190	7	- -	HAND PUMP			
102	ESCUELA NORMAL CENTRO AMERICA	/ 1953	PRIVATE (SCHOOL)	DO.				TUBE WELL (STEEL)		15	66	- -	SUBMERS. MOTOR PUMP	?	?	50
103	DO.	/ 1982	PRIVATE	DO.	TOTAL OF 102 TO 104 => 532			TUBE WELL (PVC)		20	66	- -	DO.	?	350	40
104	DO.	/ 1950	DO.	DO.				TUBE WELL (STEEL)		20	60	- -	DO.	?	?	50
105	IVAN BETANCOUR	/ (UNDER CONSTRUCTION)	COMUNITY	DO.	3	18		DUG WELL				- -				
106	DO.	/ 1983	DO.	DO.	4	24		DO.	120	180	9	- -	HAND PUMP			
107	DO.	/ 1983	DO.	DOMESTIC	39	214		DO.	120	170	9	- -	HAND PUMP			
108	DO.	/ (UNDER CONSTRUCTION)	DO.	DRINK	2	15		DO.	120	170	9	- -				
109	DO.	/ 1984	DO.	DRINK, DOMESTIC	3	18		DO.	100	150	19	- -	HAND PUMP			
110	PLAYITAS	/ 1987		DRINK	8	48		DO.				- -	HAND PUMP			
111	PLAYITAS	/ 1987	COMUNITY	DRINK, DOMESTIC	2	14		DUG WELL	130	170	19	- -	HAND PUMP			
112	TERREROS (AJUTERIQUE)	/ 1987	DO.	DO.	2	12		DO.		110	6	- -	DO.			
113	DO.	/ 1986	DO.	DO.	6	36		DO.	110	175	5	- -	DO.			
114	DO.	/ 1985	DO.	DO.	2	12		DO.	135	180	4	- -	DO.			
115	DO.	/ 1985	DO.	DRINK	3	18		DO.	100	150	5	- -	DO.			
116	DO.	/ 1986	PRIVATE	DO.	1	6		DO.	135	200	8	- -	DO.			
117	DO.	/ (UNDER CONSTRUCTION)	DO.	DO.	1	6		DO.				- -				
118	DO.	/ 1985	COMUNITY	DRINK, DOMESTIC	2	12		DO.	100	150	4	- -	DO.			
119	PLAYITAS	/ 1985	DO.	DO.	4	24		DO.	110	160	5.2	- -	DO.			
120	DO.	/ 1985	PRIVATE	DO.	1	7		DO.	110	170	4.85	- -	DO.			

Table 4.1.9 (7) INVENTRY OF THE EXISTING WELLS IN THE COMAYAGUA BASIN (7/9)

WELL NO.	LOCATION (COMUNITY NAME)	DATE OF CONSTRUCTION (month / year)	OWNER	CONDITION OF UTILIZATION PURPOSE OF USAGE	BENEFICIARY HOUSES	BENEFICIARY POPULATION	PUMPING RATE (M3/DAY)	SPECIFICATION OF THE WELL CLASSIFICATION	DIAMETER (cm) INSIDE	DIAMETER (cm) OUTSIDE	DEPTH (m)	POSITION OF SCREEN m - m	SPECIFICATION OF PUMPING FACILITY CLASIFICATION	INSTALLED DEPTH (m)	MAX. CAPACITY (M3/DAY)	COLUM. DIA. (mm)
121	PLAYITAS	/ 1986	PRIVATE	IRRIGATION, LIVE-STOCK				PIT	300 X 500		6	-	TURBINE PUMP	?	?	100
122	HACIENDA JUAN CHAVES	/ 1984	DO.	DRINK, DOMESTIC	1	3		DUG WELL	150	185	10	-	NO FACILITY			
123	CAMINO NUEVO	/ 1987	COMUNITY	DO.	3	23		DO.	115	165	12	-	HAND PUMP			
124	INFOP	/	PRIVATE	NO USE				DO.				-	NO FACILITY			
125	DO.	/ 1976	DO.	IRRIGATION				DO.	72	90	15	-	TURBINE PUMP	?	?	25
126	ASENTAMIENTO MIRAVELLE	12 / 1987	PRIMARY SCHOOL	DRINK, DOMESTIC				DO.	80	170	16	-	HAND PUMP			
127	ASENTAMIENTO 2 DE ABRIL	3 / 1988	COMUNITY	DO.	4	26		DO.	130	190	14	-	DO.			
128	DO.	/ (UNDER CONSTRUCTION)	DO.	DO.	3	18		DO.				-				
129	MONTE ALTO	3 / 1988	DO.	DO.	4	30		DO.	110	150	12	-	HAND PUMP			
130	HACIENDA LOS AMADOS	6 / 1987	PRIVATE	DRINK, DOMESTIC, IRRIGATION	1	10	600	TUBE WELL (PVC)		15	27	-	SUBMERS. MOTOR PUMP	?	600	50
131	HACIENDA LOS AMADOS	/	PRIVATE	NO USE				TUBE WELL (PVC)		10	30	-	NO FACILITY			
132	COL. MATIL DE CORDOBA	/ 1985	COMUNITY	DRINK, DOMESTIC	30	200		DUG WELL	120	180	15	-	HAND PUMP			
133	EL SIFON	/ 1987	DO.	DO.	3	18		DO.	130	170	19.44	-	DO.			
134	MATA DE CANA	/ 1986	DO.	DO.	3	18		DO.	120	180	14	-	DO.			
135	DO.	/ 1983	DO.	DO.	4	24		DO.	110	150	9	-	DO.			
136	DO.	/ 1983	DO.	DOMESTIC	2	12		DO.	120	150	4	-	DO.			
137	HACIENDA ELER	/	PRIVATE	?				TUBE WELL (STEEL)		20	?	-	SUBMERS. MOTOR PUMP	?	?	100
138	HACIENDA RANCHO GLORIA	/	DO.	?				DO.		20	?	-	DO.	?	?	100
139	CENTRO NACIONAL DE AGRICULTURA Y GANADERA	/ 1966	DO.	?				DO.		15	100	-	NO FACILITY			
140	DO.	/	DO.	DRINK, DOMESTIC, IRRIGATION			100	DO.				-	SUBMERS. MOTOR PUMP	?	?	100

Table 4.1.9 (8) INVENTRY OF THE EXISTING WELLS IN THE COMAYAGUA BASIN (8/9)

WELL NO.	LOCATION (COMUNITY NAME)	DATE OF CONDTRUCTION (month / year)	OWNER	CONDITION OF UTILIZATION PURPOSE OF USAGE	BENEFICIARY HOUSES	BENEFICIARY POPULATION	PUMPING RATE (M3/DAY)	CLASSIFICATION	SPECIFICATION DIANETER (cm) INSIDE	DIANETER (cm) OUTSIDE	THE WELL DEPTH (m)	POSITION OF SCREEN m - m	SPECIFICATION OF PUMPING FACILITY CLASIFICATION	INSTALLED DEPTH (m)	MAX. CAPACITY (M3/DAY)	COLUM. DIA. (mm)
141	CENTRO NACIONAL DE AGRICULTURA Y GANADERA	/	PRIVATE	NO USE				TUBE WELL (STEEL)		15	50	- -	NO FACILITY			
142	COMAYAGUA	/	ALIMENTOS DE VALLE	FACTORY				DO.		25	90	- -	SUBMERS. MOTOR PUMP	?	350	75
143	DO.	/	DO.	DO.				DO.		20	100	- -	DO.	?	?	100
144	DO.	/	DO.	DO.		TOTAL OF 142 TO 146 =>1000		DO.		15	100	- -	DO.	?	?	75
145	DO.	/	DO.	DO.				DO.		20	75	- -	DO.	?	700	100
146	DO.	/	DO.	DO.				DO.		15	?	- -	DO.	?	?	50
147	DO.	/	AGRO INT_ ERNACIONAL	DOMESTIC			100	TUBE WELL (PVC)		20	?	- -	DO.	?	?	50
148	DO.	/	DEMASA	DOMESTIC			50	DUG WELL	350		4	- -	TURBINE PUMP	?	?	40
149	DO.	/ 1987	DO.	FACTORY			150	TUBE WELL (PVC)		10	60	- -	SUBMERS. MOTOR PUMP	?	?	50
150	VILLA DILMA (COMAYAGUA)	/ 1981	PRIVATE	DRINK, DOMESTIC				DUG WELL	100	190	4	- -	HAND PUMP			
151	VILLA DILMA (COMAYAGUA)	/ 1985	PRIVATE	NO USE				TUBE WELL (PVC)		15	7	- -	NO FACILITY			
152	LAS PAREDES	/ 1982	DO.	IRRIGATION				TUBE WELL (STEEL)		10		- -	TURBINE PUMP	?	?	40
153	PALMEROLA	/ 1987	ALIMENTOS DEL VALLE	FACTORY				TUBE WELL (PVC)		20	85	- -	SUBMERS. MOTOR PUMP	?	200	50
154	DO.	12 / 1986	DO.	DO.		TOTAL OF 153 TO 156		TUBE WELL (STEEL)		15	90	- -	DO.	?	260	50
155	DO.	5 / 1988	DO.	DO.		=>		DO.		10	90	- -	DO.	?	?	50
156	DO.	/	DO.	DO.				DO.		20	90	- -	DO.	?	290	50
157	EL CARAO	6 / 1988	PRIVATE	?				DO.		15	55	- -	NO FACILITY			
158	ASENTOMIENTO SAN BLAS JARIN	/ 1981	COMUNITY	DRINK, DOMESTIC	8	48		DUG WELL	120	160	8	- -	HAND PUMP			
159	HACIENDA PALMEROLA	/	PRIVATE	NO USE				TUBE WELL (PVC)		20	90	- -	NO FACILITY			
160	DO.	/	DO.	NO USE				DO.		20	90	- -	DO.			

Table 4.1.9 (9) INVENTRY OF THE EXISTING WELLS IN THE COMAYAGUA BASIN (9/9)

WELL NO.	LOCATION (COMUNITY NAME)	DATE OF CONDTRUCTION (month / year)	OWNER	CONDITION OF UTILIZATION PURPOSE OF USAGE	BENEFICIARY HOUSES	BENEFICIARY POPULATION	PUMPING RATE (M3/DAY)	SPECIFICATION OF THE WELL CLASSIFICATION	DIAMETER (cm) INSIDE	DIAMETER (cm) OUTSIDE	DEPTH (m)	POSITION OF SCREEN m - m	SPECIFICATION OF PUMPING FACILITY CLASIFICATION	INSTALLED DEPTH (m)	MAX. CAPACITY (M3/DAY)	COLUM. DIA. (mm)
161	HACIENDA PALMEROLA	/	PRIVATE	NO USE				TUBE WELL (PVC)		20	90	- -	NO FACILITY			
162	HACIENDA RANCHO LAURA ELENA	/ 1983	DO.	DRINK, DOMESTIC	2	12		DUG WELL		150	?	- -	HAND PUMP			
163	HACIENDA LA LEMONTA	/	DO.	DO.				DO.		?	?	- -	TURBINE PUMP	?	200	25
164	LOORILLERA LA FORTELEJA	/ 1975	DO.	DO.	TOTAL OF 164 TO 165 8	48		DO.	150	250	20	- -	HAND PUMP			
165	DO.	/	DO.	DO.				DO.	145	175	20	- -	SUBMERS. MOTOR PUMP	?	?	25
166	USA BASE (PARUMEROLA)	/	DO.	DO.			80	TUBE WELL				- -	DO.	?	?	?
167	DO.	/	DO.	DO.			175	DO.				- -	DO.	?	?	?
168	DO.	/	DO.	DO.			95	DO.				- -	DO.	?	?	?
169	DO.	/	DO.	DO.			210	DO.				- -	DO.	?	?	?
170	DO.	/ 1988	DO.	DO.			?	DO.				- -	DO.	?	?	?

Table 4.1.10 (1) RESULT OF SIMULTANEOUS GROUND WATER LEVEL OBSERVATION (1/5)

			GROUND WATER LEVEL							
			March, 1988		May, 1988		June, 1988		February, 1989	
WELL NO.	G.L. (EL. + m)	WELL TOP (GL. + m)	DEPTH (- m)	EL. (+ m)	DEPTH (- m)	EL. (+ m)	DEPTH (- m)	EL. (+ m)	DEPTH (- m)	EL. (+ m)
1	615	0.53	16.13	599.40	15.99	599.54	-	-	-	-
2	609	0.45	5.70	603.75	6.56	602.89	6.31	603.14	-	-
3	570	0.00	-	-	-	-	-	-	-	-
4	590	0.25	4.10	586.15	4.60	585.65	-	-	3.88	586.37
5	595	0.30	>9.17	<586.13	>9.17	<586.13	8.60	586.70	7.71	587.59
6	563	0.40	12.59	550.81	12.59	550.81	12.53	550.87	-	-
7	648	0.65	10.82	637.83	11.22	637.43	-	-	-	-
8	660	0.20	8.20	652.00	8.52	651.68	8.18	652.02	8.31	651.89
9	632	0.60	12.90	619.70	12.94	619.66	13.00	619.60	12.08	620.52
10	639	0.60	26.70	612.90	26.45	613.15	-	-	-	-
11	635	0.40	5.60	629.80	5.85	629.55	5.85	629.55	4.89	630.51
12	666	0.00	-	-	-	-	-	-	-	-
13	642	0.40	2.55	639.85	2.62	639.78	-	-	2.36	640.04
14	655	0.40	5.45	649.95	7.92	647.48	5.03	650.37	-	-
15	715	0.50	17.55	697.95	17.51	697.99	17.54	697.96	17.50	698.00
16	646	0.55	7.05	639.50	7.25	639.30	7.33	639.22	-	-
17	610	0.40	13.25	597.15	-	-	-	-	-	-
18	603	0.25	19.78	583.47	19.69	583.56	18.98	584.27	19.00	584.25
19	585	0.40	2.97	582.43	3.70	581.70	3.60	581.80	1.88	583.52
20	585	0.00	9.06	575.94	-	-	-	-	-	-
21	578	0.00	-	-	-	-	-	-	-	-
22	597	0.30	1.33	595.97	1.20	596.10	-	-	-	-
23	575	0.70	10.79	564.91	11.95	563.75	11.70	564.00	3.70	572.00
24	578	0.00	-	-	-	-	-	-	-	-
25	578	0.00	-	-	-	-	-	-	-	-
26	576	0.40	3.72	572.68	3.80	572.60	4.43	571.97	-	-
27	619	0.00	-	-	-	-	-	-	-	-
28	607	0.40	7.12	600.28	7.40	600.00	7.61	599.79	-	-
29	580	0.20	2.37	577.83	3.10	577.10	2.38	577.82	2.40	577.80
30	561	0.45	5.05	556.40	5.15	556.30	5.21	556.24	4.78	556.67
31	620	0.38	>21.40	<598.98	>21.40	<598.98	>21.40	<598.98	19.21	601.17
32	669	0.17	10.29	658.88	10.65	658.52	9.08	660.09	9.55	659.62
33	673	0.38	45.53	627.85	-	-	-	-	-	-
34	675	0.00	-	-	-	-	-	-	-	-
35	618	0.50	14.90	603.60	-	-	14.05	604.45	9.25	609.25

Table 4.1.10 (2) RESULT OF SIMULTANEOUS GROUND WATER LEVEL OBSERVATION (2/5)

WELL NO.	G.L. (EL. + m)	WELL TOP (GL. + m)	GROUND WATER LEVEL March, 1988 DEPTH (- m)	March, 1988 EL. (+ m)	May, 1988 DEPTH (- m)	May, 1988 EL. (+ m)	June, 1988 DEPTH (- m)	June, 1988 EL. (+ m)	February, 1989 DEPTH (- m)	February, 1989 EL. (+ m)
36	576	0.55	7.49	569.06	7.85	568.70	-	-	-	-
37	567	0.47	-	-	9.21	558.26	-	-	-	-
38	635	0.00	-	-	-	-	-	-	-	-
39	634	0.39	-	-	12.44	621.95	10.83	623.56	7.73	626.66
40	616	0.50	-	-	10.93	605.57	-	-	-	-
41	606	0.00	-	-	-	-	-	-	-	-
42	610	0.30	-	-	16.50	593.80	-	-	-	-
43	598	0.45	-	-	12.34	586.11	-	-	-	-
44	589	0.56	-	-	9.17	580.39	-	-	-	-
45	585	0.43	-	-	3.60	581.83	1.63	583.80	-	-
46	595	0.35	-	-	6.02	589.33	-	-	-	-
47	592	0.50	-	-	6.70	585.80	-	-	-	-
48	587	0.00	-	-	2.70	584.30	-	-	-	-
49	589	0.00	-	-	-	-	-	-	-	-
50	592	0.40	-	-	7.64	584.76	-	-	-	-
51	650	0.45	-	-	16.43	634.02	16.20	634.25	14.72	635.73
52	652	0.50	-	-	6.80	645.70	-	-	-	-
53	648	0.22	-	-	8.84	639.38	8.65	639.57	7.28	640.94
54	646	0.50	-	-	11.73	634.77	-	-	-	-
55	725	0.00	-	-	-	-	-	-	-	-
56	664	0.70	-	-	12.90	651.80	-	-	-	-
57	666	0.67	-	-	11.66	655.01	-	-	-	-
58	668	0.00	-	-	-	-	-	-	-	-
59	662	0.00	-	-	-	-	-	-	-	-
60	660	0.00	-	-	-	-	-	-	-	-
61	647	0.35	-	-	6.42	640.93	-	-	-	-
62	635	0.00	-	-	16.93	618.07	-	-	-	-
63	635	0.20	-	-	13.25	621.95	13.16	622.04	12.28	622.92
64	635	0.35	-	-	15.64	619.71	-	-	-	-
65	633	0.55	-	-	14.17	619.38	-	-	-	-
66	635	0.60	-	-	15.10	620.50	-	-	-	-
67	603	0.80	-	-	16.16	587.64	16.13	587.67	15.79	588.01
68	600	0.20	-	-	4.40	595.80	2.17	598.03	1.70	598.50
69	600	0.00	-	-	-	-	-	-	-	-
70	662	0.00	-	-	-	-	-	-	-	-

Table 4.1.10 (3) RESULT OF SIMULTANEOUS GROUND WATER LEVEL OBSERVATION (3/5)

			GROUND WATER LEVEL							
			March, 1988		May, 1988		June, 1988		February, 1989	
WELL NO.	G.L. (EL. + m)	WELL TOP (GL. + m)	DEPTH (- m)	EL. (+ m)	DEPTH (- m)	EL. (+ m)	DEPTH (- m)	EL. (+ m)	DEPTH (- m)	EL. (+ m)
71	600	0.25	-	-	6.86	593.39	-	-	-	-
72	594	0.00	-	-	5.46	588.54	-	-	-	-
73	596	0.30	-	-	-	-	-	-	-	-
74	605	0.00	-	-	10.20	594.80	-	-	-	-
75	603	0.00	-	-	-	-	-	-	-	-
76	601	0.40	-	-	13.57	587.83	-	-	4.32	597.08
77	585	0.25	-	-	-	-	-	-	-	-
78	588	0.00	-	-	-	-	-	-	-	-
79	613	0.55	-	-	17.75	595.80	10.26	603.29	-	-
80	613	0.30	-	-	-	-	-	-	-	-
81	618	0.30	-	-	12.77	605.53	-	-	-	-
82	615	0.25	-	-	14.23	601.02	-	-	-	-
83	634	0.50	-	-	5.39	629.11	-	-	-	-
84	655	0.25	-	-	10.50	644.75	10.50	644.75	10.59	644.66
85	652	0.20	-	-	3.16	649.04	-	-	-	-
86	629	0.40	-	-	5.76	623.64	-	-	-	-
87	639	0.45	-	-	1.70	637.75	0.92	638.53	-	-
88	646	0.30	-	-	2.03	644.27	-	-	1.52	644.78
89	643	0.35	-	-	-	-	-	-	-	-
90	656	0.00	-	-	-	-	-	-	-	-
91	653	0.50	-	-	4.00	649.50	2.99	650.51	3.01	650.49
92	647	0.00	-	-	6.70	640.30	6.08	640.92	-	-
93	642	0.00	-	-	9.40	632.60	-	-	-	-
94	616	0.25	-	-	15.43	600.82	-	-	-	-
95	617	0.45	-	-	17.40	600.05	-	-	16.60	600.85
96	646	0.00	-	-	3.38	642.62	-	-	-	-
97	645	0.55	-	-	11.53	634.02	11.18	634.37	9.69	635.86
98	653	0.00	-	-	-	-	-	-	-	-
99	646	0.50	-	-	8.00	638.50	-	-	-	-
100	552	0.35	-	-	6.44	545.91	-	-	-	-
101	545	0.55	-	-	5.55	540.00	5.53	540.02	5.13	540.42
102	550	0.00	-	-	16.80	533.20	-	-	-	-
103	550	0.40	-	-	-	-	-	-	-	-
104	552	0.00	-	-	11.30	540.70	13.30	538.70	-	-
105	555	0.00	-	-	7.30	547.70	-	-	-	-

Table 4.1.10 (4) RESULT OF SIMULTANEOUS GROUND WATER LEVEL OBSERVATION (4/5)

WELL NO.	G.L. (EL. + m)	WELL TOP (GL. + m)	GROUND WATER LEVEL March, 1988 DEPTH (- m)	March, 1988 EL. (+ m)	May, 1988 DEPTH (- m)	May, 1988 EL. (+ m)	June, 1988 DEPTH (- m)	June, 1988 EL. (+ m)	February, 1989 DEPTH (- m)	February, 1989 EL. (+ m)
106	552	0.25	-	-	7.44	544.81	-	-	-	-
107	552	0.55	-	-	7.40	545.15	-	-	-	-
108	554	0.00	-	-	7.54	546.46	-	-	-	-
109	555	0.30	-	-	7.87	547.43	7.78	547.52	7.04	548.26
110	617	0.45	-	-	17.74	599.71	-	-	-	-
111	616	0.27	-	-	17.90	598.37	-	-	-	-
112	603	0.00	-	-	5.00	598.00	-	-	-	-
113	598	0.37	-	-	3.25	595.12	-	-	-	-
114	595	0.40	-	-	2.68	592.72	-	-	-	-
115	597	0.45	-	-	3.36	594.09	-	-	-	-
116	604	0.42	-	-	6.19	598.23	-	-	-	-
117	604	0.00	-	-	5.55	598.45	-	-	-	-
118	606	0.68	-	-	2.15	604.53	-	-	-	-
119	593	0.45	-	-	>5.20	<588.25	-	-	-	-
120	600	0.40	-	-	>4.85	<595.55	-	-	-	-
121	580	0.00	-	-	5.10	574.90	-	-	-	-
122	590	0.10	-	-	9.00	581.10	8.83	581.27	5.26	584.84
123	584	0.38	-	-	10.57	573.81	9.83	574.55	7.23	577.15
124	609	0.00	-	-	-	-	-	-	-	-
125	607	0.20	-	-	-	-	12.53	594.67	11.23	595.97
126	576	0.45	-	-	14.35	562.10	13.58	562.87	-	-
127	585	0.41	-	-	12.00	573.41	-	-	-	-
128	586	0.00	-	-	10.20	575.80	-	-	-	-
129	586	0.52	-	-	10.00	576.52	10.99	575.53	9.23	577.29
130	605	0.00	-	-	-	-	-	-	-	-
131	610	0.00	-	-	17.50	592.50	17.62	592.38	-	-
132	666	0.35	-	-	13.65	652.70	-	-	-	-
133	617	0.30	-	-	>19.44	<597.86	>19.44	<597.86	-	-
134	560	0.40	-	-	12.52	547.88	12.40	548.00	12.01	548.39
135	565	0.80	-	-	7.07	558.73	-	-	-	-
136	540	0.70	-	-	2.18	538.52	1.52	539.18	2.00	538.70
137	557	0.10	-	-	-	-	-	-	-	-
138	575	0.20	-	-	-	-	-	-	-	-
139	575	0.00	-	-	11.00	564.00	-	-	-	-
140	571	0.00	-	-	-	-	-	-	-	-

Table 4.1.10 (5) RESULT OF SIMULTANEOUS GROUND WATER LEVEL OBSERVATION (5/5)

			GROUND WATER LEVEL							
			March, 1988		May, 1988		June, 1988		February, 1989	
WELL NO.	G.L. (EL. + m)	WELL TOP (GL. + m)	DEPTH (- m)	EL. (+ m)	DEPTH (- m)	EL. (+ m)	DEPTH (- m)	EL. (+ m)	DEPTH (- m)	EL. (+ m)
141	570	0.25	-	-	3.12	567.13	-	-	-	-
142	550	0.00	-	-	-	-	-	-	-	-
143	550	0.00	-	-	-	-	-	-	-	-
144	550	0.00	-	-	-	-	-	-	-	-
145	550	0.00	-	-	-	-	-	-	-	-
146	550	0.00	-	-	-	-	-	-	-	-
147	555	0.00	-	-	-	-	-	-	-	-
148	575	0.00	-	-	2.10	572.90	-	-	-	-
149	575	0.00	-	-	-	-	-	-	-	-
150	586	0.40	-	-	2.10	584.30	1.65	584.75	1.69	584.71
151	593	0.28	-	-	4.44	588.84	4.22	589.06	3.63	589.65
152	588	0.45	-	-	-	-	-	-	-	-
153	644	0.00	-	-	-	-	-	-	-	-
154	646	0.00	-	-	-	-	-	-	-	-
155	646	0.00	-	-	-	-	-	-	-	-
156	646	0.45	-	-	-	-	-	-	-	-
157	588	0.00	-	-	5.65	582.35	5.35	582.65	-	-
158	578	0.20	-	-	5.80	572.40	-	-	5.25	572.95
159	600	0.00	-	-	10.42	589.58	-	-	-	-
160	597	0.00	-	-	14.70	582.30	-	-	-	-
161	595	0.00	-	-	15.71	579.29	13.90	581.10	-	-
162	575	0.00	-	-	-	-	-	-	-	-
163	578	0.00	-	-	-	-	-	-	-	-
164	595	0.30	-	-	18.50	576.80	-	-	-	-
165	593	0.55	-	-	18.60	574.95	18.63	574.92	18.41	575.14
166	633	0.00	-	-	-	-	-	-	-	-
167	630	0.00	-	-	-	-	-	-	-	-
168	630	0.00	-	-	-	-	-	-	-	-
169	630	0.00	-	-	-	-	-	-	-	-
170	632	0.00	-	-	-	-	-	-	-	-

Table 4.1.11 (1) RESULTS OF WATER QUALITY ANALYSIS PERFORMED IN RAINY SEASON (MIDDLE JUNE,1988) (1/3)

No.	Sample Date	Sample Site	W.Temp °C	EC (microS/cm) in-situ	EC (microS/cm) at t=25°C	PH Ref.1	Na mg/l Ref.2	K mg/l Ref.2	Ca mg/l Ref.2	Mg mg/l Ref.3	Cl mg/l Ref.2
1	6/21	R-5	22.0	160	171	8.00	2.9	1.5	29	6	4.3
2	6/21	R-14	27.0	66	63	7.50	7.2	5.2	2.9	2	4.9
3	6/21	R-19	25.0	47	47	7.65	4.3	3.2	2.2	1	4.2
4	6/21	R-25	26.5	46	45	7.30	4.5	3.7	2.2	2	3.6
5	6/20	R-44	25.0	43	43	7.22	39	3.5	2.5	2	4.3
1	6/21	W-2	27.0	220	211	6.55	21	9	12	5	21
2	6/17	W-6	29.5	1100	1001	7.15	104	10	42	38	35
3	6/21	W-8	29.0	380	349	7.15	21	1.7	49	12	2.7
4	6/21	W-16	27.5	470	445	7.85	31	22	52	9	5.5
5		W-21									
6	6/20	W-26	27.0	760	728	7.40	50	30	65	25	59
7	6/20	W-28	25.5	270	267	6.95	15	9	31	7	7.5
8	6/20	W-32	26.0	710	695	7.22	17	11	100	35	22
9	6/20	W-33	28.5	220	204	6.95	21	4.5	13	10	4.7
10	6/21	W-35	28.5	4200	3900	7.75	900	95	92	11	180
11	6/18	W-51	27.0	540	517	6.85	36	9.3	60	13	8
12	6/18	W-63	30.0	700	631	7.35	58	24	55	9	11
13	6/21	W-81	28.0	600	563	7.05	70	20	38	11	18
14	6/21	W-87	28.5	410	381	7.05	45	26	22	4	10
15	6/21	W-92	26.0	180	176	6.95	21	8.9	5.2	7	3.2
16	6/17	W-109	28.0	920	863	7.05	73	21	70	26	18
17	6/18	W-122	29.0	835	767	6.95	43	5	95	22	9
18	6/21	W-126	27.5	980	929	7.25	30	17	105	43	11
19	6/20	W-141	27.0	660	632	6.80	47	20	58	28	10
20	6/17	W-142	31.0	1000	883	7.45	105	23	38	6	33
21	6/21	W-149	24.5	800	809	7.25	95	10	42	41	20
22	6/21	W-154	30.0	460	414	7.50	13	5.5	65	3	4.7

Remarks ; *1 Ref.1 : Determined by glass-electrode
*2 Ref.2 : Determined by ion-electrode
*3 Ref.3 : Calculated from Ca and total Hardness
All the items were analyzed by JICA Study Team.

Table 4.1.11 (2) RESULTS OF WATER QUALITY ANALYSIS PERFORMED IN RAINY SEASON (MIDDLE JUNE,1988) (2/3)

No.	Sample Date	Sample Site	NO_3-N mg/l Ref.2	NO_2-N mg/l Ref.4	F mg/l Ref.2	NH_4-N mg/l Ref.4	Total-Fe mg/l Ref.4	Zn mg/l Ref.4	PH4.8-Alkal. mg/l as $CaCO_3$ Ref.5	Total Hardness mg/l as $CaCO_3$ Ref.5
1	6/21	R-5	0.8	<0.006	0.1	<0.4	<0.2	<0.5	80	95
2	6/21	R-14	0.9	<0.006	0.1	0.5	<0.2	0.5	31	15
3	6/21	R-19	1.3	<0.006	0.1	<0.4	<0.2	<0.5	33	10
4	6/21	R-25	0.9	<0.006	0.1	<0.4	0.2	<0.5	32	13
5	6/20	R-44	1.0	<0.006	0.1	0.5	<0.2	0.5 - 1.0	24	15
1	6/21	W-2	5.5	<0.006	0.1	0.5	0.2	<0.5	64	50
2	6/17	W-6	2.7	<0.006	0.4	<0.4	<0.2	5	466	260
3	6/21	W-8	1.3	<0.006	0.4	<0.4	<0.2	<0.5	160	170
4	6/21	W-16	1.1	<0.006	0.4	<0.4	0.2	<0.5	242	165
5		W-21								
6	6/20	W-26	4.8	<0.006	0.3	<0.4	<0.2	<0.5	298	265
7	6/20	W-28	1.6	0.02 - 0.006	0.2	<0.4	<0.2	5.0	144	105
8	6/20	W-32	7.7	0.1 - 0.03	0.2	<0.4	<0.2	<0.5	248	395
9	6/20	W-33	2.8	0.02 - 0.006	0.3	<0.4	<0.2	5.0	108	75
10	6/21	W-35	36	0.02	4.5	<0.4	<0.2	<0.5	468	275
11	6/18	W-51	1.9	<0.006	0.5	<0.4	<0.2	0.5	236	205
12	6/18	W-63	1.7	0.02 - 0.006	0.2	1.6 - 2.0	<0.2	<0.5	292	175
13	6/21	W-81	2.5	<0.006	0.4	<0.4	<0.2	0.5	192	140
14	6/21	W-87	2.4	<0.006	0.4	<0.4	<0.2	<0.5	168	70
15	6/21	W-92	0.6	<0.006	0.3	<0.4	<0.2	2.0	106	40
16	6/17	W-109	3.7	<0.006	0.2	<0.4	<0.2	0.5	351	280
17	6/18	W-122	2.3	0.05 - 0.015	0.9	<0.4	<0.2	2.0	336	330
18	6/21	W-126	3.0	<0.006	0.6	<0.4	<0.2	<0.5	284	440
19	6/20	W-141	1.7	<0.006	0.3	<0.4	0.5	2.0	458	260
20	6/17	W-142	2.8	0.05 - 0.015	1.4	<0.4	<0.2	<0.5	380	120
21	6/21	W-149	2.4	<0.006	1.1	<0.4	<0.2	5.0 - 10.	260	275
22	6/21	W-154	1.4	0.2 - 0.06	0.2	<0.4	<0.2	<0.5	216	175

Remarks ; *1 Ref.2 : Determined by ion-electrode
*2 Ref.4 : Determined by the simplified testing kit(pack-test)
*3 Ref.5 : Determined by titration
All the items were analized by JICA Study Team.

Table 4.1.11 (3) RESULTS OF WATER QUALITY ANALYSIS PERFORMED
IN RAINY SEASON (MIDDLE JUNE,1988) (3/3)

No.	Sample Site	Organic Material (mg/l)	Total Coliform: Filtered Volume (ml)	Coliform Colonies (nos.)	Col.Density in 100 ml (nos.)	Observations
1	R-5	0.0	2	32	1600	
2	R-14	13.6	2	12	600	
3	R-19	4.0	2	25	1250	
4	R-25	6.4	5	23	450	Campo lleno
5	R-44	13.6	3	2	65	Campo lleno
1	W-2	1.6	2	*2	*1	Campo lleno total
2	W-6					
3	W-8	0.0	5	10	200	Disperasas
4	W-16	0.0	5	3	60	Disperasas
5	W-21					
6	W-26	12.0	1	12	1200	
7	W-28	0.0	1	8	800	
8	W-32	0.8	3	*1	*1	U.S.Formacion de B
9	W-33	1.6	0.5	0	0	
10	W-35	4.8	5	7	140	
11	W-51					
12	W-63					
13	W-81	4.0	4	8	200	Campo lleno total
14	W-87	2.4	5	*1	*1	Campo lleno total
15	W-92	0.0	3	7	233	Disperasas
16	W-109					
17	W-122					
18	W-126	0.0	5	8	160	
19	W-141	0.0	0.5	12	2400	
20	W-142					
21	W-149	8.0	5	3	60	Disperasas
22	W-154	8.0	5	0	0	2 Colonias

Remarks : *1 : No se pudo leer *2 : No se pudo leer campo lleno
U.S.Formacion de B : Una sola formacion de bacterias
All the items were analized by MPH counterpart.

Table 4.1.12 (1) RESULTS OF WATER QUALITY ANALYSIS PERFORMED IN DRY SEASON (END JANUARY, 1989) (1/3)

No.	Sample Date	Sample Site	W.Temp °C	EC (microS/cm) in-situ	EC (microS/cm) at t=25°C	PH	Na mg/l	K mg/l	Ca mg/l	Mg mg/l	Cl mg/l	SO_4 mg/l	SiO_2 mg/l
1	1/26	R-5	19.0	160	184	8.40	3.5	0.9	34.0	3.9	2.6	17	35
2	1/26	R-14	24.0	46	47	8.40	4.2	2.1	2.8	1.0	3.1	2	57.5
3	1/26	R-19	24.0	53	54	8.80	5.5	3.2	3.2	0.7	3.1	6	70
4	1/25	R-25	26.0	79	77	8.00	8.5	4.4	4.4	1.0	3.2	2	75
5	1/25	R-44	20.0	63	71	7.40	8.5	2.6	4.4	1.7	2.8	40	54
1	1/25	W-2	25.0	160	160	6.00	21	6.2	6.0	2.2	12	14	100
2		W-6											
3		W-8											
4	1/26	W-16	26.0	440	431	8.00	31	20	44.8	14.1	5.5	-	137.5
5	2/17	W-21	28.5	500	464	6.80	58	17	29.0	6.6	54.0	47	
6	1/25	W-26	25.0	730	730	7.30	56	26	71.3	16.5	52	18	157.5
7	1/25	W-28	26.0	380	372	6.80	21.5	11.5	48.0	5.1	6.5	43	112.5
8	1/25	W-32	29.0	730	671	6.90	18	10	96.9	16.5	25	80	65
9	1/25	W-33	28.0	140	131	7.00	9.2	3.3	10.0	2.2	3.7	12	77.5
10		W-35											
11	1/26	W-51	26.0	270	264	7.10	14	6.4	30.4	9.7	9.5	33	82.5
12	1/26	W-63	29.0	790	726	7.50	51	23	78.5	10.7	17.5	-	112.5
13	1/26	W-81	26.0	460	450	7.10	40	16	35.2	4.9	18	2	157.5
14	1/26	W-87	26.0	330	323	7.10	41	21.5	12.8	1.9	18	14	142.5
15	1/26	W-92	26.0	140	137	7.10	17	8.2	6.4	1.7	3.5	-	160
16	1/25	W-109	25.0	750	750	7.50	105	19	75.3	23.6	14.5	170	155
17	1/26	W-122	26.0	950	930	8.10	125	7	51.3	41.0	10	200	92.5
18		W-126											
19		W-141											
20		W-142											
21	1/25	W-149	28.0	900	844	7.20	85	10.5	73.7	14.6	15.5	135	127.5
22	1/26	W-154	31.0	460	406	7.40	14.5	5.1	66.4	8.5	3.8	24	97.5

Remarks ; All the items were analized by JICA Study Team except for SO_4

Table 4.1.12 (2) RESULTS OF WATER QUALITY ANALYSIS PERFORMED IN DRY SEASON (END JANUARY, 1989) (2/3)

No.	Sample Date	Sample Site	NO_3-N *2 mg/l	NO_2-N *2 mg/l	F *1 mg/l	NH_4 *2 mg/l	NH_4-N *2 mg/l	Total-Fe mg/l	Zn mg/l	PH4.8-Alkal. *1 mg/l as $CaCO_3$	Total Hardness *3 mg/l as $CaCO_3$	PO_4 *2 mg/l
1	1/26	R-5	4.4	0.01	0.12	0.167	0.13			94.9	101	0.07
2	1/26	R-14	3.54	0.0165	0.06	0.1806	0.14			17.0	11	0.08
3	1/26	R-19	8.8	0.0109	0.08	0.064	0.05			21.1	11	0.0
4	1/25	R-25	4.4	0.0109	0.1	0.296	0.23			31.1	15	0.3
5	1/25	R-44	6.16	0.016	0.1	0.0387	0.03			24.1	18	0.03
1	1/25	W-2	4.4	0.033	0.08	0.516	0.4			40.0	24	0.3
2		W-6										
3		W-8										
4	1/26	W-16	6.6	0.008	0.35	0.038	0.03			233.0	170	0.09
5	2/17	W-21	3.0	3.4		0.04		1.5		160.0	100	0.4
6	1/25	W-26	4.4	0.01	0.26	0.129	0.1			270.5	246	0.05
7	1/25	W-28	8.8	0.016	0.16	0.051	0.04			131.0	141	0.5
8	1/25	W-32	35.2	0.01	0.18	0.193	0.15			177.0	310	0.56
9	1/25	W-33	0	0.01	0.25	0.038	0.03			42.4	34	0.3
10		W-35										
11	1/26	W-51	0	0.008	0.20	0.683	0.53			93.0	116	0.45
12	1/26	W-63	0	0	0.26	8.256	6.4			375.0	240	0.35
13	1/26	W-81	13.2	0.009	0.21	0.09	0.07			147.0	108	0.32
14	1/26	W-87	11.0	0.01	0.25	0.154	0.12			106.0	40	0.1
15	1/26	W-92	5.28	0.0109	0.26	0.18	0.14			69.6	23	0.63
16	1/25	W-109	13.2	0.016	0.25	0.129	0.1			334.0	285	0.6
17	1/26	W-122	4.4	0.0165	1.55	0.412	0.32			385.0	296	0.15
18		W-126										
19		W-141										
20		W-142										
21	1/25	W-149	5.28	0.01	1.05	0.064	0.05			297.0	244	0.05
22	1/26	W-154	3.5	0.128	0.20	0.528	0.41			202.0	201	0.24

Remarks ; *1 : analized by JICA Study Team.
*2 : analized by MPH counterpart.
*3 : calculated from concentrations of Ca and Mg ions.

Table 4.1.12 (3) RESULTS OF WATER QUALITY ANALYSIS PERFORMED IN DRY SEASON (END JANUARY, 1989) (3/3)

No.	Sample Site	Organic Material (mg/l)	Total Coliform (1) Filtered Volume (ml)	Total Coliform (2) Coliform Colonies (nos.)	Total Coliform (3) Col.Density in 100ml (nos.)	Coliform Fecales Sample-1 (1) Fil.Vol.	Sample-1 (2) Col.Colo.	Sample-1 (3) Col.Dens.	Sample-2 (1) Fil.Vol.	Sample-2 (2) Col.Colo.	Sample-2 (3) Col.Dens.	Mean of Col.Dens.
1	R-5	2.3	0.2	4	2000	0.1	2	2000	0.5	3	600	1300
2	R-14	8.0	0.1	3	3000	0.5	2	400	0.5	35	7000	3700
3	R-19	2.4	0.1	1	1000	0.1	2	2000	0.5	15	3000	2500
4	R-25	0.8	0.2	5	2500	0.1	2	2000	0.5	4	800	1400
5	R-44	1.2	0.1	0	0	0.1	91	91000	0.5	45	9000	50000
1	W-2	3.2	0.5	1	200	1.0	1	100	5.0	14	280	190
2	W-6											
3	W-8											
4	W-16	2.4	0.2	0	0	1.0	0	0	0.5	0	0	0
5	W-21											
6	W-26	10.4	5.0	68	1360	5.0	20	400	1.0	8	800	600
7	W-28	5.6	0.5	32	6400	0.2	19	9500	0.5	34	6800	8150
8	W-32	6.4	0.5	37	7400	0.5	18	3600	1.0	12	1200	2400
9	W-33	1.2	0.5	0	0	0.5	0	0	1.0	0	0	0
10	W-35											
11	W-51	16.0	0.2	4	2000	0.1	7	7000	0.5	9	1800	4400
12	W-63	28.2	0.1	53	53000	0.1	0	0	0.5	2	400	200
13	W-81	3.2	0.5	2	400	1.0	2	200	2.0	7	350	275
14	W-87	8.0	0.1	2	2000	0.1	7	7000	0.5	16	3200	5100
15	W-92	0.8	5.0	0	0	10.0	0	0	5.0	0	0	0
16	W-109	5.6	2.0	4	200	1.0	6	600	0.5	4	800	700
17	W-122	1.6	0.1	3	3000	0.1	4	4000	0.5	3	600	2300
18	W-126											
19	W-141											
20	W-142											
21	W-149		10.0	5	50	5.0	0	0	2.0	4	200	100
22	W-154	0.0	5.0	14	280	1.0	7	700	5.0	0	0	350

Remarks ; All the items were analized by MPH counterparts.

Table 4.1.13 WATER QUALITY OF TEST WELLS

No.	Sample Date	Sample Site	W.Temp °C	EC (microS/cm) in-situ	EC (microS/cm) at t=25°C	PH	Na mg/l	K mg/l	Ca mg/l	Mg mg/l	Cl mg/l	SO_4 mg/l	SiO_2 mg/l
1	2/13	TW-1	30.5	1900	1695		280.0	65.0	80.0	16.0	89.0	42.0	
2	2/16	*TW-1(23m)	29.0	1800	1654		320.0	79.0	92.0	18.0	100.0	< 5.0	
3	2/16	*TW-1(57m)	29.0	1900	1746		340.0	86.0	80.0	18.0	100.0	< 5.0	
4	1/27	TW-2	30.0	400	360	7.30	13.0	3.6	59.3	5.1	3.3	20.0	92.5
5	2/17	TW-3	29.0	850	781	6.80	130.0	27.0	30.0	10.0	84.0	25.0	
6	2/20	*TW-3(30m)	28.5	1100	1021	6.80	180.0	34.0	38.0	13.0	64.0	23.0	
7	2/20	*TW-3(48m)	28.5	1600	1486	6.70	260.0	47.0	49.0	21.0	100.0	21.0	
8	2/3	TW-4	37.0	640	506		101.0	20.0	2.3	1.6	63.0	60.0	
9	2/10	TW-5	26.0	220	215		22.0	21.0	8.9	3.8	65.0	9.8	

* : In-situ sampling

No.	Sample Site	NO_3-N mg/l	NO_2-N mg/l	F mg/l	NH_4 mg/l	NH_4-N mg/l	Total-Fe mg/l	Zn mg/l	PH4.8-Alkal. mg/l as $CaCO_3$	Total Hardness** mg/l as $CaCO_3$	PO_4 mg/l
1	TW-1	< 0.5	< 0.01		38.0		35.0		790	266	1.2
2	*TW-1	< 0.5	< 0.01		47.0		15.0		1020	304	
3	*TW-1	< 0.5	< 0.01		51.0		11.0		1040	274	0.4
4	TW-2	2.6	0.00	0.20	0.06	0.05			174	169	0.1
5	TW-3	< 0.5	< 0.01		16.0		0.2		380	116	
6	*TW-3	< 0.5	< 0.01		24.0		9.6		520	148	0.3
7	*TW-3	< 0.5	< 0.01		45.0		11.0		800	209	2.0
8	TW-4	< 0.5	< 0.01		< 0.02		0.1		150	12	0.9
9	TW-5	22.0	< 0.01		0.03		< 0.1		57	38	1.2

* : In-situ sampling ** : calculated from the concentrations of Ca and Mg ions (T.H. = 2.5*Ca + 4.1*Mg).

No.	Sample Site	Organic Material (mg/l)	Total Coliform (1) Filtered Volume (ml)	Total Coliform (2) Coliform Colonies (nos.)	Total Coliform (3) Col.Density in 100ml (nos.)	Coliform Fecales Sample-1 (1) Fil.Vol.	Sample-1 (2) Col.Colo.	Sample-1 (3) Col.Dens.	Sample-2 (1) Fil.Vol.	Sample-2 (2) Col.Colo.	Sample-2 (3) Col.Dens.	Mean (nos.)
1	TW-1		20	3	15							
2	TW-2	3.2	10	0	0	10.0	0	0	20.0	0	0	0
3	TW-3		10	20	200							
4	TW-4		30	2	7							
5	TW-5		20	6	30							

Table 4.1.14 CATION COMPOSITION OF WATER SAMPLES

--- Rainy Season (middle June, 1988) --- (uinit : me/l)

No.	Sample Site	Na	K	Ca	Mg	Total	Na+Ca
1	R-5	0.13	0.04	1.45	0.49	2.11	1.58
2	R-14	0.31	0.13	0.14	0.16	0.74	0.45
3	R-19	0.19	0.08	0.11	0.08	0.46	0.30
4	R-25	0.21	0.09	0.11	0.16	0.57	0.32
5	R-44	1.71	0.09	0.12	0.16	2.08	1.83
	Mean	0.51	0.09	0.39	0.21	1.19	0.90
1	W-2	0.91	0.23	0.61	0.41	2.16	1.52
2	W-6	4.52	0.26	2.11	3.13	10.02	6.63
3	W-8	0.91	0.04	2.45	0.99	4.39	3.36
4	W-16	1.35	0.56	2.59	0.74	5.24	3.94
5	W-21						
6	W-26	2.17	0.77	3.24	2.06	8.24	5.41
7	W-28	0.65	0.23	1.55	0.58	3.01	2.20
8	W-32	0.74	0.28	4.99	2.88	8.89	5.73
9	W-33	0.91	0.12	0.65	0.82	2.50	1.56
10	W-35	39.15	2.42	4.59	0.91	47.07	43.74
11	W-51	1.57	0.24	2.99	1.07	5.87	4.56
12	W-63	2.52	0.61	2.74	0.74	6.61	5.26
13	W-81	3.04	0.51	1.91	0.91	5.37	4.95
14	W-87	1.96	0.66	1.11	0.33	4.06	3.07
15	W-92	0.91	0.23	0.26	0.58	1.98	1.17
16	W-109	3.18	0.54	3.49	2.14	9.35	6.67
17	W-122	1.87	0.13	4.74	1.81	8.55	6.61
18	W-126	1.31	0.43	5.24	3.54	10.52	6.55
19	W-141	2.04	0.51	2.89	2.31	7.75	4.93
20	W-142	4.57	0.59	1.91	0.49	7.56	6.48
21	W-149	4.13	0.26	2.11	3.37	9.87	6.24
22	W-154	0.57	0.14	3.24	0.25	4.20	3.81
	Mean	3.76	0.46	2.64	1.43	8.30	6.40

--- Dry Season (end January, 1989) --- (uinit : me/l)

No.	Sample Site	Na	K	Ca	Mg	Total	Na+Ca
1	R-5	0.15	0.02	1.70	0.32	2.19	1.85
2	R-14	0.18	0.05	0.14	0.08	0.45	0.32
3	R-19	0.24	0.08	0.16	0.06	0.54	0.40
4	R-25	0.37	0.11	0.22	0.08	0.78	0.59
5	R-44	0.37	0.07	0.22	0.14	0.80	0.59
	Mean	0.26	0.07	0.49	0.14	0.95	0.75
1	W-2	0.91	0.16	0.30	0.18	1.55	1.21
2	W-6						
3	W-8						
4	W-16	1.35	0.51	2.24	1.16	5.26	3.58
5	W-21	2.52	0.43	1.45	0.54	4.94	3.97
6	W-26	2.44	0.66	3.56	1.36	8.02	5.99
7	W-28	0.94	0.29	2.40	0.42	4.05	3.33
8	W-32	0.78	0.26	4.84	1.36	7.24	5.62
9	W-33	0.40	0.08	0.50	0.18	1.16	0.90
10	W-35						
11	W-51	0.61	0.16	1.52	0.80	3.09	2.13
12	W-63	2.22	0.59	3.92	0.88	7.61	6.14
13	W-81	1.74	0.41	1.76	0.40	4.31	3.50
14	W-87	1.78	0.55	0.64	0.16	3.13	2.42
15	W-92	0.74	0.21	0.32	0.14	1.41	1.06
16	W-109	4.57	0.49	3.76	1.94	10.76	8.32
17	W-122	5.44	0.18	2.56	3.37	11.55	8.00
18	W-126						
19	W-141						
20	W-142						
21	W-149	3.70	0.27	3.68	1.20	8.85	7.38
22	W-154	0.63	0.13	3.31	0.70	4.77	3.94
23	TW-1	12.18	1.66	3.99	1.32	19.15	16.17
24	TW-2	0.57	0.09	2.96	0.42	4.04	3.53
25	TW-3	5.65	0.69	1.50	0.82	8.66	7.15
26	TW-4	4.39	0.51	0.11	0.13	5.14	4.50
27	TW-5	0.96	0.54	0.44	0.31	2.25	1.40
	Mean	2.60	0.42	2.18	0.85	6.04	4.77

Table 4.1.15 ANION COMPOSITION OF WATER SAMPLES

--- Rainy Season (middle June,1988) --- (unit : me/l)

No.	Sampl Site	(1) M-O Alk	(2) Cl	(3) (1)+(2)	(4) Total C	(4)-(3)	Estimat. Sulfate
1	R-5	1.61	0.12	1.73	2.11	0.38	0.38
2	R-14	0.62	0.14	0.76	0.74	-0.02	
3	R-19	0.66	0.12	0.78	0.46	-0.32	
4	R-25	0.64	0.11	0.75	0.57	-0.18	
5	R-44	0.48	0.12	0.6	2.08	1.48	1.48
	Mean	0.8	0.12	0.92	1.19		0.93
1	W-2	1.28	0.59	1.87	2.11	0.24	0.24
2	W-6	9.32	0.99	10.31	10.02	-0.29	
3	W-8	3.21	0.08	3.29	4.39	1.1	1.1
4	W-16	4.84	0.16	5	5.24	0.24	0.24
5	W-21						
6	W-26	5.96	1.66	7.62	8.24	0.62	0.62
7	W-28	2.88	0.21	3.09	3.01	-0.08	
8	W-32	4.96	0.62	5.58	8.89	3.31	3.31
9	W-33	2.18	0.13	2.31	2.5	0.19	0.19
10	W-35	9.36	5.08	14.44	47.07	32.63	32.63
11	W-51	4.72	0.23	4.95	5.87	0.92	0.92
12	W-63	5.84	0.31	6.15	6.61	0.46	0.46
13	W-81	3.84	0.51	4.35	6.37	2.02	2.02
14	W-87	3.36	0.28	3.64	4.06	0.42	0.42
15	W-92	2.12	0.09	2.21	1.98	-0.23	
16	W-109	7.02	0.51	7.53	9.35	1.82	1.84
17	W-122	6.72	0.25	6.97	8.55	1.58	1.58
18	W-126	5.68	0.31	5.99	10.52	4.53	4.53
19	W-141	9.16	0.28	9.44	7.75	-1.69	
20	W-142	6.16	0.93	7.09	7.56	0.47	0.47
21	W-149	5.21	0.56	5.77	9.87	4.1	4.1
22	W-154	4.32	0.13	4.45	4.2	-0.25	
	Mean	5.15	0.66	5.81	8.29		3.42

M-O Alk. : M-O Alkalinity Total C : Total Cation

- Dry Season (end January,1989) --- (unit : me/l)

No.	Sampl Site	(1) M-O Alk	(2) Cl	(3) SO4	(4) Total A	(5) Total C	(6) Sulfate E
1	R-5	1.9	0.07	0.35	2.32	2.19	0.22
2	R-14	0.34	0.09	0.04	0.47	0.45	0.02
3	R-19	0.42	0.09	0.12	0.63	0.54	0.03
4	R-25	0.62	0.09	0.04	0.75	0.78	0.07
5	R-44	0.48	0.08	0.83	1.39	0.8	0.24
	Mean	0.75	0.08	0.28	1.11	0.95	0.12
1	W-2	0.8	0.34	0.29	1.43	1.55	0.42
2	W-6						
3	W-8						
4	W-16	4.66	0.16	0	4.82	5.26	0.44
5	W-21	3.20	1.52	0.92	5.64	4.94	0.22
6	W-26	5.41	1.47	0.37	7.25	8.02	1.15
7	W-28	2.62	0.18	0.9	3.7	4.05	1.25
8	W-32	3.54	0.71	1.67	5.92	7.24	3
9	W-33	0.85	0.1	0.25	1.2	1.16	0.21
10	W-35						
11	W-51	1.86	0.27	0.69	2.82	3.09	0.96
12	W-63	7.5	0.49	0	7.99	7.61	0
13	W-81	2.94	0.51	0.04	3.49	4.31	0.86
14	W-87	2.12	0.51	0.29	2.92	3.13	0.51
15	W-92	1.4	0.1	0	1.5	1.41	0
16	W-109	6.68	0.41	3.54	10.63	10.76	3.69
17	W-122	7.7	0.28	4.16	12.14	11.55	3.59
18	W-126						
19	W-141						
20	W-142						
21	W-149	5.94	0.44	2.81	9.19	8.85	2.48
22	W-154	4.04	0.11	0.50	4.65	4.77	0.62
23	TW-1	15.8	2.51	0.88	19.19	19.15	0.84
24	TW-2	3.48	0.09	0.42	3.99	4.04	0.47
25	TW-3	7.6	2.37	0.52	10.49	8.66	-1.31
26	TW-4	3.00	1.78	1.25	6.03	5.14	0.36
27	TW-5	1.14	1.83	0.20	3.17	2.25	-0.72
	Mean	4.39	0.77	0.94	6.10	6.04	0.91

M-O Alk. : M-O Alkalinity Total A : Total Anion = (1)+(2)+(3)
Total C : Total Cation Salfate E : SO4 estimated = (5)-(1)-(2)

Table 4.1.16 PERCENT CONSTITUENTS OF CATION

--- Rainy Season (middle June, 1988) ---

No.	Sample Site	Na %	K %	Ca %	Mg %	Cation %
1	R-5	6	2	69	23	100
2	R-14	42	18	19	22	100
3	R-19	41	17	24	17	100
4	R-25	37	16	19	28	100
5	R-44	82	4	6	8	100
	Mean	42	11	27	20	100
1	W-2	42	11	28	19	100
2	W-6	45	3	21	31	100
3	W-8	21	1	56	23	100
4	W-16	26	11	49	14	100
5	W-21					
6	W-26	26	9	39	25	100
7	W-28	22	8	51	19	100
8	W-32	8	3	56	32	100
9	W-33	36	5	26	33	100
10	W-35	83	5	10	2	100
11	W-51	27	4	51	18	100
12	W-63	38	9	41	11	100
13	W-81	48	8	30	14	100
14	W-87	48	16	27	8	100
15	W-92	46	12	13	29	100
16	W-109	34	6	37	23	100
17	W-122	22	2	55	21	100
18	W-126	12	4	50	34	100
19	W-141	26	7	37	30	100
20	W-142	60	8	25	6	100
21	W-149	42	3	21	34	100
22	W-154	14	3	77	6	100
	Mean	35	7	38	21	100

--- Dry Season (end January, 1989) ---

No.	Sample Site	Na %	K %	Ca %	Mg %	Cation %
1	R-5	7	1	78	15	100
2	R-14	40	11	31	18	100
3	R-19	44	15	30	11	100
4	R-25	47	14	28	10	100
5	R-44	46	9	28	18	100
	Mean	37	10	39	14	100
1	W-2	59	10	19	12	100
2	W-6					
3	W-8					
4	W-16	26	10	43	22	100
5	W-21	51	9	29	11	100
6	W-26	30	8	44	17	100
7	W-28	23	7	59	10	100
8	W-32	11	4	67	19	100
9	W-33	34	7	43	16	100
10	W-35					
11	W-51	20	5	49	26	100
12	W-63	29	8	52	12	100
13	W-81	40	10	41	9	100
14	W-87	57	18	20	5	100
15	W-92	52	15	23	10	100
16	W-109	42	5	35	18	100
17	W-122	47	2	22	29	100
18	W-126					
19	W-141					
20	W-142					
21	W-149	42	3	42	14	100
22	W-154	13	3	69	15	100
23	TW-1	63	9	21	7	100
24	TW-2	14	2	73	11	100
25	TW-3	65	8	17	10	100
26	TW-4	85	10	2	3	100
27	TW-5	43	24	19	14	100
	Mean	40	8	38	14	100

Table 4.1.17 PERCENT CONSTITUENTS OF ANION

--- Rainy Season (middle June, 1988) ---

No.	Sample Site	M-O Alk. me/l	Cl me/l	Total A me/l	:	M-O Alk. %	Cl %	Total A %
1	R-5	1.61	0.12	1.73	:	93	7	100
2	R-14	0.62	0.14	0.76	:	82	18	100
3	R-19	0.66	0.12	0.78	:	85	15	100
4	R-25	0.64	0.11	0.75	:	85	15	100
5	R-44	0.48	0.12	0.6	:	80	20	100
	Mean	0.8	0.12	0.92	:	85	15	100
1	W-2	1.28	0.59	1.87	:	68	32	100
2	W-6	9.32	0.99	10.31	:	90	10	100
3	W-8	3.21	0.08	3.29	:	98	2	100
4	W-16	4.84	0.16	5	:	97	3	100
5	W-21							
6	W-26	5.96	1.66	7.62	:	78	22	100
7	W-28	2.88	0.21	3.09	:	93	7	100
8	W-32	4.96	0.62	5.58	:	89	11	100
9	W-33	2.18	0.13	2.31	:	94	6	100
10	W-35	9.36	5.08	14.44	:	65	35	100
11	W-51	4.72	0.23	4.95	:	95	5	100
12	W-63	5.84	0.31	6.15	:	95	5	100
13	W-81	3.84	0.51	4.35	:	88	12	100
14	W-87	3.36	0.28	3.64	:	92	8	100
15	W-92	2.12	0.09	2.21	:	96	4	100
16	W-109	7.02	0.51	7.53	:	93	7	100
17	W-122	6.72	0.25	6.97	:	96	4	100
18	W-126	5.68	0.31	5.99	:	95	5	100
19	W-141	9.16	0.28	9.44	:	97	3	100
20	W-142	6.16	0.93	7.09	:	87	13	100
21	W-149	5.21	0.56	5.77	:	90	10	100
22	W-154	4.32	0.13	4.45	:	97	3	100
	Mean	5.15	0.66	5.81		90.14	9.86	100.00

Remarks M-O Alk. : M-O Alkalinity
Total A : Total Anion

--- Dry Season (end January, 1989) ---

No.	Sample Site	M-O Alk. me/l	Cl me/l	SO4 me/l	Total A me/l	M-O Alk. %	Cl %	SO4 %	Total A
1	R-5	1.90	0.07	0.35	2.32	82	3	15	100
2	R-14	0.34	0.09	0.04	0.47	72	19	9	100
3	R-19	0.42	0.09	0.12	0.63	67	14	19	100
4	R-25	0.62	0.09	0.04	0.75	83	12	5	100
5	R-44	0.48	0.08	0.83	1.39	35	6	60	100
	Mean	0.75	0.08	0.28	1.11	68	8	25	100
1	W-2	0.80	0.34	0.29	1.43	56	24	20	100
2	W-6								
3	W-8								
4	W-16	4.66	0.16	0	4.82	97	3	0	100
5	W-21	3.20	1.52	0.92	5.64	57	27	16	100
6	W-26	5.41	1.47	0.37	7.25	75	20	5	100
7	W-28	2.62	0.18	0.9	3.7	71	5	24	100
8	W-32	3.54	0.71	1.67	5.92	60	12	28	100
9	W-33	0.85	0.1	0.25	1.2	71	8	21	100
10	W-35								
11	W-51	1.86	0.27	0.69	2.82	66	10	24	100
12	W-63	7.50	0.49	0	7.99	94	6	0	100
13	W-81	2.94	0.51	0.04	3.49	84	15	1	100
14	W-87	2.12	0.51	0.29	2.92	73	17	10	100
15	W-92	1.40	0.1	0	1.5	93	7	0	100
16	W-109	6.68	0.41	3.54	10.63	63	4	33	100
17	W-122	7.70	0.28	4.16	12.14	63	2	34	100
18	W-126								
19	W-141								
20	W-142								
21	W-149	5.94	0.44	2.81	9.19	65	5	31	100
22	W-154	4.04	0.11	0.5	4.65	87	2	11	100
23	TW-1	15.80	2.51	0.88	19.19	82	13	5	100
24	TW-2	3.48	0.09	0.42	3.99	87	2	11	100
25	TW-3	7.60	2.37	0.52	10.49	72	23	5	100
26	TW-4	3.00	1.78	1.25	6.03	50	30	21	100
27	TW-5	1.14	1.83	0.20	3.17	36	58	6	100
	Mean	4.39	0.77	0.94	6.10	75	9	16	100

Remarks M-O Alk. : M-O Alkalinity
Total A : Total Anion

Table 4.1.18 RELATIONSHIP BETWEEN ELECTRIC CONDUCTANCE AND TOTAL CONCENTRATION OF IONIC SUBSTANCES

--- Rainy Season (middle June, 1988) ---

No.	Sample Site	E.C. 25 oC M.S/cm	Total Hardness as CaCO3 mg/l	Cation Total me/l	Na+K me/l (%)	Ca+Mg me/l (%)	Anion Total me/l	M-O Alk me/l (%)	Cl+E.SO4 me/l (%)
1	R-5	171	95	2.11	0.17 (8)	1.94 (92)	2.11	1.61 (76)	0.50 (24)
2	R-14	63	15	0.74	0.44 (59)	0.30 (41)		0.62	
3	R-19	47	10	0.46	0.27 (59)	0.19 (41)		0.66	
4	R-25	45	13	0.57	0.30 (53)	0.27 (47)		0.64	
5	R-44	43	15	2.08	1.80 (87)	0.28 (13)	2.08	0.48 (23)	1.60 (77)
	Mean	74	30	1.19	0.60 (53)	0.60 (47)	2.10	0.80 (50)	1.05 (51)
1	W-2	211	50	2.16	1.14 (53)	1.02 (47)	2.11	1.28 (61)	0.83 (39)
2	W-6	1001	260	10.02	4.78 (48)	5.24 (52)		9.32	
3	W-8	349	170	4.39	0.95 (22)	3.44 (78)	4.39	3.21 (73)	1.18 (27)
4	W-16	445	165	5.24	1.91 (36)	3.33 (64)	5.24	4.84 (92)	0.40 (8)
5	W-21								
6	W-26	728	265	8.24	2.94 (36)	5.30 (64)	8.24	5.96 (72)	2.28 (28)
7	W-28	267	105	3.01	0.88 (29)	2.13 (71)		2.88	
8	W-32	695	395	8.89	1.02 (11)	7.87 (89)	8.89	4.96 (56)	3.93 (44)
9	W-33	204	75	2.50	1.03 (41)	1.47 (59)	2.50	2.18 (87)	0.32 (13)
10	W-35	3900	275	47.07	41.57 (88)	5.50 (12)	47.07	9.36 (20)	37.71 (80)
11	W-51	517	205	5.87	1.81 (31)	4.06 (69)	5.87	4.72 (80)	1.15 (20)
12	W-63	631	175	6.61	3.13 (47)	3.48 (53)	6.61	5.84 (88)	0.77 (12)
13	W-81	563	140	6.37	3.55 (56)	2.82 (44)	6.37	3.84 (60)	2.53 (40)
14	W-87	381	70	4.06	2.62 (65)	1.44 (35)	4.06	3.36 (83)	0.70 (17)
15	W-92	176	40	1.98	1.14 (58)	0.84 (42)		2.12	
16	W-109	863	280	9.35	3.72 (40)	5.63 (60)	9.35	7.02 (75)	2.33 (25)
17	W-122	767	330	8.55	2.00 (23)	6.55 (77)	8.55	6.72 (79)	1.83 (21)
18	W-126	929	440	10.52	1.74 (17)	8.78 (83)	10.52	5.68 (54)	4.84 (46)
19	W-141	632	260	7.75	2.55 (33)	5.20 (67)		9.16	
20	W-142	883	120	7.56	5.16 (68)	2.40 (32)	7.56	6.16 (81)	1.40 (19)
21	W-149	809	275	9.87	4.39 (44)	5.48 (56)	9.87	5.21 (53)	4.66 (47)
22	W-154	414	175	4.20	0.71 (17)	3.49 (83)		4.32	
	Mean	732	203	8.30	4.23 (51)	4.07 (49)	9.20	5.15 (70)	4.18 (30)

M-O Alk. : M-O Alkalinity
E.SO4 : Estimated Sulfate

--- Dry Season (end January, 1989) ---

No.	Sample Site	E.C. 25 oC M.S/cm	Total Hardness as CaCO3 mg/l	Cation Total me/l	Na+K me/l (%)	Ca+Mg me/l (%)	Anion Total me/l	M-O Alk me/l (%)	Cl+SO4 me/l (%)
1	R-5	184	101	2.19	0.17 (8)	2.02 (92)	2.32	1.90 (82)	0.42 (18)
2	R-14	47	11	0.45	0.23 (51)	0.22 (49)	0.47	0.34 (72)	0.13 (28)
3	R-19	54	11	0.54	0.32 (59)	0.22 (41)	0.63	0.42 (67)	0.21 (33)
4	R-25	77	15	0.78	0.48 (62)	0.30 (38)	0.75	0.62 (83)	0.13 (17)
5	R-44	71	18	0.80	0.44 (55)	0.36 (45)	1.39	0.48 (35)	0.91 (65)
	Mean	87	31	0.95	0.33 (47)	0.62 (53)	1.11	0.75 (68)	0.36 (32)
1	W-2	160	24	1.55	1.07 (69)	0.48 (31)	1.43	0.80 (56)	0.63 (44)
2	W-6								
3	W-8								
4	W-16	431	170	5.26	1.86 (35)	3.40 (65)	4.82	4.66 (97)	0.16 (3)
5	W-21	464	100	4.94	2.95 (60)	1.99 (40)	5.64	3.20 (57)	2.44 (43)
6	W-26	730	246	8.02	3.10 (39)	4.92 (61)	7.25	5.41 (75)	1.84 (25)
7	W-28	372	141	4.05	1.23 (30)	2.82 (70)	3.70	2.62 (71)	1.08 (29)
8	W-32	671	310	7.24	1.04 (14)	6.20 (86)	5.92	3.54 (60)	2.38 (40)
9	W-33	131	34	1.16	0.48 (41)	0.68 (59)	1.20	0.85 (71)	0.35 (29)
10	W-35								
11	W-51	264	116	3.09	0.77 (24)	2.32 (75)	2.82	1.86 (66)	0.96 (34)
12	W-63	726	240	7.61	2.81 (37)	4.80 (63)	7.99	7.50 (94)	0.49 (5)
13	W-81	450	108	4.31	2.15 (50)	2.16 (50)	3.49	2.94 (84)	0.55 (16)
14	W-87	323	40	3.13	2.33 (74)	0.80 (26)	2.92	2.12 (73)	0.80 (27)
15	W-92	137	23	1.41	0.95 (67)	0.46 (33)	1.50	1.40 (93)	0.10 (7)
16	W-109	750	285	10.76	5.06 (47)	5.70 (53)	10.63	6.68 (63)	3.95 (37)
17	W-122	930	296	11.55	5.62 (49)	5.93 (51)	12.14	7.70 (63)	4.44 (37)
18	W-126								
19	W-141								
20	W-142								
21	W-149	844	244	8.85	3.97 (45)	4.88 (55)	9.19	5.94 (65)	3.25 (35)
22	W-154	406	201	4.77	0.76 (16)	4.01 (84)	4.65	4.04 (87)	0.61 (13)
23	TW-1	1965	266	19.15	13.84 (72)	5.31 (28)	19.19	15.80 (82)	3.39 (18)
24	TW-2	360	169	4.04	0.66 (16)	3.38 (84)	3.99	3.48 (87)	0.51 (13)
25	TW-3	781	116	8.66	6.34 (73)	2.32 (27)	10.49	7.60 (72)	2.89 (28)
26	TW-4	506	12	5.14	4.90 (95)	0.24 (5)	6.03	3.00 (50)	3.03 (50)
27	TW-5	215	38	2.25	1.50 (67)	0.75 (33)	3.17	1.14 (36)	2.03 (64)
	Mean	553	151	6.04	3.02 (49)	3.03 (51)	6.10	4.39 (71)	1.71 (29)

M-O Alk. : M-O Alkalinity

Table 4.2.1 DESCRIPTION OF METEORO-HYDROLOGICAL DATA

I. Meteorological Stations and Data Available

Station name	Observation period	Meteorological data: Daily/monthly Rainfall	Temperature	Relative Humidity	Wind Velocity	Evaporation	Sun Shine Hour
Siguatepeque	1956 - 1988[1]	D/M	M	M	M	M	M
El Tarado	1958 - 1971[1]	M	M	-	-	-	-
Flores	1945 - 1988[1]	D/M	M	M	M	M	M
Lamani	1956 - 1979	D/M	-	-	-	-	-
El Coyolar	1958 - 1988[1]	D/M	M	M	-	M	-
Comayagua	1943 - 1974[1]	D/M	D	-	-	-	-
El Horno	1965 - 1976	M	-	-	-	-	-
Villa de San Antonio	1955 - 1958	M	M	-	-	-	-
Playitas	1965 - 1988[1]	D/M	M	M	M	M	M
Las Botijas	1965 - 1988[1]	D/M	-	-	-	-	-
San Jose de Pane	1969 - 1971	M	-	-	-	-	-
La Laguna	1965 - 1988	D/M	-	-	-	-	-
La Mora	1970 - 1988	D/M	-	-	-	-	-
Zambrano	1958 - 1988	D/M	-	-	-	-	-
Lepaterque	1969 - 1988	D/M	-	-	-	-	-
Santa Clara	1967 - 1988	D/M	M	M	-	M	-
La Paz	1943 - 1956[1]	D/M	-	-	-	-	-
Ajuterique	1965 - 1967[1]	D/M	-	-	-	-	-

Remarks 1. Intermittent data D : Daily data - : No data
M : Monthly data

II. Hydrological Stations and Data Collected

Station name	Observation period	Daily/Monthly Runoff data
Humuya en Las Higueras	1967 - 1988[1]	D / M
Humuya en La Encantada	1967 - 1988[1]	D / M

Remarks 1. Intermittent data D : Daily data
M : Monthly data

Table 4.2.2 METEOROLOGICAL FEATURES IN THE STUDY AREA

A. Monthly Mean Temperature (°C)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Ave.
Siguatepeque (1953-1988)	18	19	21	23	23	22	22	22	22	21	19	18	21
Flores (1958-1988)	22	23	25	26	26	25	25	25	25	24	23	23	24

B. Monthly Evaporation and Potential Evapotranspiration (mm)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Siguatepeque (1972-1988)													
pan	98	116	158	169	158	131	147	135	112	100	86	88	1498
potential	67	81	111	118	111	92	103	95	78	70	60	62	1049
Flores (1974-1988)													
pan	161	183	240	221	182	144	153	154	128	131	123	139	1960
potential	113	128	168	155	127	101	107	108	89	92	86	97	1372

C. Monthly Mean Relative Humidity (%)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Ave.
Siguatepeque (1972-1988)	79	75	69	67	72	77	76	78	81	83	83	82	77
Flores (1974-1988)	60	56	52	53	59	67	64	64	68	69	67	63	62

D. Monthly Mean Wind Velocity (m/s)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Ave.
Siguatepeque (1980-1988)	1.4	1.9	2.0	2.1	2.0	1.3	1.7	1.8	1.2	1.4	1.5	1.5	1.7
Flores (1984- 1988)	5.3	4.2	4.6	3.6	2.8	2.0	3.0	2.4	1.8	3.5	3.4	3.8	3.4

E. Monthly Sunshine Hour (hours)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Ave.
Siguatepeque (1972-1988)	187	191	234	208	183	188	206	214	168	152	155	167	188
Flores (1974-1988)	215	233	265	199	212	175	185	205	176	190	196	208	205

Table 4.2.3 RESULT OF RUNOFF MEASUREMENT

Point No.	River Name	Discharge (cms) 1988 Mar.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	1989 Jan.
R-1	Qda.JARIN	LT. 0.01	-	-							
*R-2	Qda.TENGUAJE	LT. 0.01	LT. 0.01	0.27	0.09	1.00		0.45	0.12	0.09	0.07
R-3	Qda.LAS CANAS	0.00	LT. 0.01	0.30							
R-4	Qda.OLANCICA	0.06	0.05	0.05							
*R-5	Rio CANQUIGUE	0.12	0.16	3.00	0.68	1.96		2.74	1.29	0.15	0.75
R-6	Rio TEPANGUARA	0.01	-	-							
R-7	"	0.00	-	-							
*R-8	"	LT. 0.01	LT. 0.01	1.23	0.83			1.91	0.07	0.00	0.04
R-9	Rio CANQUIGUE	0.00	0.00	-							
R-10	Rio HUMUYA	existing station									
R-11	Rio YARUMELA	0.09	-	-							
R-12	Rio TUJACA	0.20	0.02	-							
R-13	"	0.00	LT. 0.01	-							
R-14	Rio SAN JOSE	0.60	MT. 0.6	1.00							
R-15	Qda.SANLA	0.01	LT. 0.01	0.10							
R-16	Qda.GUALCOQUITA	0.01	LT. 0.01	0.10							
R-17	Qda.MARAGUA	LT. 0.01	LT. 0.01	MT. 1.0							
R-18	Qda.LOS COYOTES	0.00	LT. 0.01	-							
R-19	Rio GRANDE	0.20	MT. 0.2	5.00							
R-20	Rio CHOCO	0.00	0.00	0.07							
R-21	Rio LAMANI	LT. 0.01	0.05	0.10							
R-22	Rio CHOCO	0.03	-	-							
R-23	Qda.AGUA SALADA	0.00	-	-							
R-24	Rio HUMUYA	0.15	-	5.00							
*R-25	"	0.20	0.18	2.50	0.30	1.70		1.82	1.03	0.31	0.51
R-26	Qda.OLANCICA	0.00	-	-							
R-27	Rio SAN JOSE	-	0.60	-							
R-28	Qda.MARAGUA	-	0.10	-							
R-29	Rio GRANDE	-	0.20	-							
R-30	Rio MOLOA	-	0.05	1.20							
R-31	Rio CHINCHINGUAR	-	0.03	0.80							
R-32	Rio CANJE	0.00	0.00	-							
R-33	Qda.MARAGUA	-	0.10	-							
R-34	Qda.CANITO	0.00	0.00	-							
R-35	Qda.MOLINO	0.00	0.00	-							
R-36	Qda.MIRA	0.00	0.00	-							
R-37	Rio CANCE	0.00	0.00	0.30							
R-38	Qda.CANGUARITA	0.00	0.00	0.40							
R-39	Qda.SICAGUARA	0.00	0.00	0.50							
R-40	Qda.JARIN	0.00	0.00	-							
R-41	Qda.TENGUAJE	0.00	0.00	-							
R-42	Qda.SECA	0.00	0.00	-							
R-43	Rio SELGUAPA										
R-44	Rio SELGUAPA										
R-45	Rio GRANDE										

Remarks LT. : Less than MT. : More than * : Monthly measurement point

Table 4.2.4 (1) MONTHLY ACTUAL CROPPING AREA AND WATER USE IN 1987 (1/3)

I. Irrigation system : Flores

--- Cropping area (ha) ---

Crops	Resistere area	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
Tomato	238	167.5	162.90	182.0	160.8	64.2	18.4	4.0	8.2	23.8	25.9	85.6	
Maize	529	140.0	144.40	203.7	329.5	167.1	58.3	1.2	30.8	32.9	32.4	99.4	
Fruits	4	36.6	17.50	50.4	44.1	22.9	2.2	0.0	0.0	0.0	0.0	24.3	
Tabacco	40	35.0	13.30	5.1	4.0	0.0	0.0	0.0	0.0	1.9	11.0	40.4	
Beans	76	31.3	13.00	40.6	20.1	0.0	0.0	0.0	0.2	0.7	7.0	15.6	
Rice	513	28.5	31.00	21.7	29.2	53.7	221.9	206.7	589.2	664.1	590.1	512.2	
Pasture	0	18.4	54.60	57.6	46.7	27.1	0.0	0.0	0.0	0.0	5.1	41.8	
Vegetables	0	12.1	15.40	46.2	17.3	1.6	0.2	0.0	0.0	0.0	0.0	0.0	
Peppers	20	8.9	21.90	17.3	20.3	9.3	1.9	0.0	2.1	5.6	4.0	23.8	
Onion	71	5.1	8.40	0.0	11.7	4.2	0.0	0.0	0.0	0.0	0.0	0.0	
Cucumber	9	4.7	6.70	0.0	0.0	0.0	0.5	1.2	0.0	0.0	1.6	6.1	No Data
Tapioca	0	4.4	7.00	3.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0	7.2	
Papaw	4	3.5	4.90	0.0	0.0	0.0	2.2	0.0	1.2	6.5	1.6	14.7	
Watermelon	1	3.3	3.00	0.0	4.2	0.0	0.0	0.0	0.0	0.0	4.2	16.8	
Sorguhm	22	1.9	0.70	12.6	2.8	6.5	0.0	6.3	0.0	0.0	2.3	7.5	
Coffee	56	1.4	72.80	27.3	28.0	0.7	0.7	0.0	0.0	0.0	0.0	52.5	
Livestock	0	0.2	3.10	7.0	13.5	23.3	10.3	0.7	0.0	0.0	0.0	14.5	
Sugar cane	0	0.0	3.30	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Squash	1	0.0	0.00	0.0	1.6	2.1	0.0	0.0	0.0	0.0	0.0	0.0	
Cabbage	0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.40	
Avocado	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Lemon	18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Guava	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total	1603	502.8	563.9	679.6	737.5	382.7	316.6	220.1	631.7	735.5	685.3	963.6	

--- Water use (x 1000 m**3) ---

Crops	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
Tomato	287.2	279.20	312.0	275.6	110.0	31.6	6.8	14.0	40.8	44.4	146.8	
Maize	240.0	247.60	349.2	564.8	286.4	100.0	2.0	52.8	56.4	55.6	170.4	
Fruits	62.8	30.00	86.4	75.6	39.2	4.0	0.0	0.0	0.0	0.0	41.6	
Tabacco	60.0	22.80	8.8	6.8	0.0	0.0	0.0	0.0	3.2	18.8	69.2	
Beans	53.6	22.40	69.6	34.4	0.0	0.0	0.0	0.4	1.2	12.0	26.8	
Rice	48.8	53.20	37.2	50.0	92.0	380.4	354.4	1010.0	1138.4	1011.6	878.0	
Pasture	31.6	93.60	98.8	80.0	46.4	0.0	0.0	0.0	0.0	8.8	71.6	
Vegitables	20.8	26.40	79.2	29.6	2.8	0.4	0.0	0.0	0.0	0.0	0.0	
Peppers	15.2	37.60	29.6	34.8	16.0	3.2	0.0	3.6	9.6	6.8	40.8	
Onion	8.8	8.40	0.0	20.0	7.2	0.0	0.0	0.0	0.0	0.0	0.0	
Cucumber	8.0	11.60	0.0	0.0	0.0	0.8	2.0	0.0	0.0	2.8	10.4	No Data
Tapioca	7.6	12.00	6.4	6.4	0.0	0.0	0.0	0.0	0.0	0.0	12.4	
Papaw	6.0	8.40	0.0	0.0	0.0	4.0	0.0	2.0	11.2	2.8	25.2	
Watermelon	5.6	5.20	0.0	7.2	0.0	0.0	0.0	0.0	0.0	7.2	28.8	
Sorghum	3.2	1.20	21.6	4.8	11.2	0.0	10.8	0.0	0.0	4.0	12.8	
Coffee	2.4	124.80	46.8	48.0	1.2	1.2	0.0	0.0	0.0	0.0	90.0	
Livestock	0.8	4.80	12.0	23.2	40.0	17.6	1.2	0.0	0.0	0.0	24.8	
Sugar cane	0.0	5.60	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Squash	0.0	0.00	0.0	2.8	3.6	0.0	0.0	0.0	0.0	0.0	0.0	
Cabbage	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	
Total	862.4	994.8	1165.2	1264.0	656.0	543.2	377.2	1082.8	1260.8	1174.8	1652.0	

Table 4.2.4 (2) MONTHLY ACTUAL CROPPING AREA AND WATER USE IN 1987 (2/3)

II. Irrigation system : San Sebastian

--- Cropping area (ha) ---

Crops	Resistere area	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
Tomato	49	62.3	52.7	53.5	33.3	35.9	30.8	9.1	32.0	46.4	49.0		
Rice	42	42.5	42.5	42.6	42.5	43.2	42.5	42.5	91.5	88.4	66.0		
Maize	69	41.6	37.1	48.3	54.6	28.0	22.4	0.9	9.1	11.2	10.3		
Watermelon	0	2.1	3.3	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Tobacco	0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	No Data	
Pasture	0	1.1	4.0	0.0	1.4	1.6	0.0	0.0	0.0	0.0	0.0		
Fruits	0	0.7	1.1	0.1	0.4	0.2	0.0	0.0	0.0	0.0	0.0		
Peppers	0	0.5	0.4	0.0	0.5	0.7	0.2	0.6	0.2	0.2	0.7		
Onion	0	0.0	0.0	1.4	5.3	4.9	1.4	0.0	0.0	0.0	0.0		
Cabbage	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7		
Beans	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.2		
Cucumber	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0		
Coffee	21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Soy bean	42	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total	231	151.8	141.1	152.5	138.0	114.5	97.3	53.1	133.7	146.2	126.9		

--- Water use (x 1000 m**3) ---

Crops	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
Tomato	149.2	120.4	115.6	76.0	82.0	70.4	22.4	73.2	105.0	112.0		
Rice	97.2	97.2	97.2	97.2	98.8	97.2	97.2	209.2	202.0	150.8		
Maize	94.8	84.8	110.4	124.8	64.0	51.2	0.2	20.8	25.6	23.6		
Watermelon	4.8	7.6	15.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Tobacco	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	No Data	
Pasture	2.4	9.2	0.0	3.2	3.6	0.0	0.0	0.0	0.0	0.0		
Fruites	1.6	2.4	0.4	0.8	0.4	0.0	0.0	0.0	0.0	0.0		
Peppers	1.2	0.8	0.0	1.2	1.6	0.4	0.4	0.4	0.4	1.6		
Onion	0.0	0.0	3.2	12.0	11.2	3.2	0.0	0.0	0.0	0.0		
Cabbage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6		
Beans	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.4		
Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0		
Total	353.6	322.4	342.0	315.2	261.6	222.4	120.2	305.6	334.0	290.0		

Table 4.2.4 (3) MONTHLY ACTUAL CROPPING AREA AND WATER USE IN 1987 (3/3)

III. Irrigation system : Selguapa

--- Cropping area (ha) ---

Crops	Resistere area	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
Onion	104	317.8	298.3	350.3	281.0	186.8	95.0	22.3					
Maize	902	309.0	309.3	348.0	333.3	193.8	102.5	11.0					
Tomato	208	132.2	131.0	139.8	143.3	142.8	64.8	24.5					
Watermelon	14	28.8	26.0	20.5	11.3	0.8	0.0	0.0					
Pasture	0	21.0	31.5	17.3	9.3	3.0	11.3	14.5					
Maize & Bean	0	16.5	30.8	21.5	13.5	0.0	0.0	0.0					
Cucumber	58	13.5	47.8	61.0	53.3	25.5	13.3	6.3					
Beans	261	10.3	17.5	31.8	8.5	12.5	0.0	0.0					
Coffee	480	9.8	5.5	9.8	8.8	3.5	0.5	0.0					
Livestoc	0	9.3	19.3	19.3	16.3	10.0	3.8	0.0			No Data		
Sugar cane	0	8.5	4.5	5.3	7.0	4.0	3.0	0.0					
Peppers	3	7.5	4.3	2.3	2.5	0.0	2.0	0.5					
Tapioca	14	5.3	4.0	4.5	4.5	2.5	0.8	0.0					
Papaw	0	4.3	6.5	3.3	7.5	7.3	0.0	0.0					
Sorguhm	0	2.8	1.5	1.5	2.8	2.3	7.0	0.5					
Fruits	0	2.3	10.3	8.3	6.8	2.5	5.3	0.0					
Cabbege	0	0.8	0.0	1.8	1.0	2.3	0.5	0.0					
Squash	0	0.5	0.0	0.0	0.0	0.0	0.0	0.0					
Maize&Tapioca	0	0.0	0.5	0.5	0.0	0.0	0.0	0.0					
Rice	91	0.0	0.0	0.0	0.0	0.0	22.0	55.5					
Vegitabl	22.00	0.0	0.0	0.0	0.0	0.8	0.0	0.0					
Total	2157	900.2	948.6	1046.8	910.7	600.4	331.8	135.1					

--- Water use (x 1000 m**3) ---

Crops	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
Onion	508.4	477.2	560.4	449.6	298.8	152.0	35.6					
Maize	494.4	494.8	556.8	333.2	310.0	164.0	17.6					
Tomato	211.2	209.6	223.6	229.2	228.4	103.6	39.2					
Watermelon	46.0	41.6	32.8	18.0	1.2	0.0	0.0					
Pasture	33.6	50.4	27.6	14.8	4.8	18.0	23.2					
Maize & Bean	25.4	49.2	34.4	21.6	0.0	0.0	0.0					
Cucumber	21.6	76.4	97.6	85.2	40.8	21.2	10.0					
Beans	16.4	28.0	50.8	13.6	20.0	0.0	0.0					
Coffee	15.6	8.8	15.6	14.0	5.6	0.8	0.0					
Livestock	14.8	30.8	30.8	26.0	16.0	6.0	0.0			No Data		
Sugar cane	13.6	7.2	8.4	11.2	6.4	4.8	0.0					
Peppers	12.0	6.8	3.6	4.0	0.0	3.2	0.8					
Tapioca	8.4	6.4	7.2	7.2	4.0	1.2	0.0					
Papaw	6.8	10.4	5.2	12.0	11.6	0.0	0.0					
Sorghum	4.4	2.4	2.4	4.4	3.6	11.2	0.8					
Fruits	3.6	16.4	13.2	10.8	4.0	8.4	0.0					
Cabbege	1.2	0.0	2.8	1.6	2.0	0.8	0.0					
Squash	0.8	0.0	0.0	0.0	0.0	0.0	0.0					
Maize & Tapioca	0.0	0.8	0.8	0.0	0.0	0.0	0.0					
Vegetables	0.0	0.0	0.0	0.0	1.2	0.0	0.0					
Rice	0.0	0.0	0.0	0.0	0.0	35.2	88.8					
Total	1439.2	1517.2	1674.0	1256.4	958.4	530.4	216.0					

Table 4.2.5 RESULT OF RUNOFF STUDY BY THE TANK MODEL SIMULATION

unit : MCM

	Las Higueras								La Encantada							
	1972		1983		1986		1988		1972		1983		1986		1988	
Month	OBS.	CALC.	OBS.	CALC.	OBS.	CALC.	OBS.	CALC.	OBS.	CALC.	OBS.	CALC.	OBS.	CALC.	OBS.	CALC.
1	4.92	5.48	3.19	5.32	3.59	5.45	2.73	5.16	11.81	13.42	10.07	7.45	2.65	10.56	8.81	7.46
2	3.96	5.40	5.41	4.86	3.16	4.80	2.58	4.80	9.45	9.46	6.49	5.74	8.70	7.06	8.17	5.95
3	3.73	5.40	6.01	5.24	3.35	5.28	2.66	5.09	8.19	7.31	7.67	6.33	7.70	6.40	7.38	6.34
4	5.48	7.40	5.82	14.40	5.72	5.08	2.96	17.88	9.87	12.10	7.93	13.77	7.13	6.14	7.14	16.24
5	16.08	66.35	4.64	15.00	5.02	69.45	3.61	59.95	14.64	50.66	4.95	21.41	8.91	73.12	8.74	63.26
6	104.03	42.97	3.40	259.79	5.95	67.34	62.12	231.42	36.01	101.18	31.43	370.66	23.77	104.72	88.24	392.73
7	10.31	6.24	0.51	39.62	3.65	7.62	0.51	157.49	12.27	23.30	37.72	55.08	17.50	19.55	99.31	273.01
8	13.99	5.68	1.39	151.83	5.72	18.41	95.60	204.19	18.01	14.46	25.48	87.08	21.16	27.14	135.25	317.65
9	9.26	33.75	1.61	102.13	15.66	76.46	181.19	161.37	29.74	74.18	112.50	268.80	49.17	141.08	247.90	329.23
10	9.15	34.87	1.47	0.84	15.86	64.75	54.81	54.59	35.82	65.86	102.49	243.11	39.01	87.21	102.29	172.54
11	6.84	6.14	2.00	32.79	7.64	13.34	17.71	6.80	16.73	9.30	46.81	72.99	29.15	35.70	37.51	27.85
12	3.88	5.23	1.66	7.27	5.38	5.20	9.74	5.36	8.09	6.35	20.15	26.03	14.43	9.13	24.01	23.30

Note OBS. : Observed monthly runoff volume
calc. : Calculated monthly runoff volume

Table 4.2.6 COMPARISON BETWEEN OBSERVED AND CALCULATED RUNOFF

Year : 1988

Tenguaje (c.a.=20.0 km^2)			Ranchitos (c.a.=42.3 km^2)			Chilcares (c.a.=62.3 km^2)			Humuya (c.a.=207.4 km^2)		
date	obsvd. (cms)	calcltd. (cms)	date	obsvd. (cms)	calcltd. (cms)	date	obsvd. (cms)	calcltd. (cms)	date	obsvd. (cms)	calcltd. (cms)
3/15	LT.0.01	0.024	3/15	0.12	0.057	3/18	LT.0.01	0.148	3/18	0.20	0.428
5/19	LT.0.01	0.023	5/25	0.16	0.056	5/25	LT.0.01	0.146	5/25	0.18	0.425
6/24	0.27	0.742	6/24	3.00	2.419	6/24	1.23	1.683	6/24	2.50	19.757
7/	0.09	0.081	7/	0.68	0.711	7/	0.83	0.994	7/	0.30	0.436
8/	1.00	1.075	9/	1.96	1.771	8/			9/	1.70	1.628
10/	0.45	0.430	10/	2.74	1.999	10/	1.91	1.897	10/	1.82	1.901
11/	0.12	0.105	11/	1.29	0.426	11/	0.07	0.157	11/	1.03	1.394
12/	0.09	0.075	12/	0.15	0.071	12/	0.00	0.157	12/	0.31	0.455

note : Runoff measurement from Mar. to Jun. was carried out by JICA study team.
Runoff measurement from Jul. to Dec. was carried out by MPH counterpart.

Table 4.2.7 SURFACE AND GROUND WATER BALANCE BY TANK MODEL SIMULATION

(Estimation of G/W potential in whole basin.)

Year	(1) Rainfall (mm)	(2) Runoff (mm)	(3) Evaporation (mm)	Ground Water Recharge Volume (4) Total (mm)	(m3/day)	phreatic (mm)	confined (mm)	(5)* (2)+(3)+(4) (mm)	G/W ratio to rainfall (%)
1967	1398.4	762.6	629.6	17.4	98120	8.7	8.7	1409.7	1.2
1968	1266.9	573.0	670.4	17.6	99087	8.8	8.8	1261.0	1.4
1969	2205.9	1434.4	702.5	17.9	100966	9.0	9.0	2154.9	0.8
1970	1282.7	594.8	670.8	18.3	103149	9.2	9.2	1284.0	1.4
1971	1297.0	656.9	624.5	18.4	103543	9.2	9.2	1299.8	1.4
1972	771.1	201.3	601.1	18.4	103419	9.2	9.2	820.8	2.4
1973	1240.9	556.5	660.4	18.1	101810	9.0	9.0	1235.0	1.5
1974	1316.6	590.3	706.5	18.3	102710	9.1	9.1	1315.1	1.4
1975	1142.7	547.2	584.2	18.3	102845	9.1	9.1	1149.7	1.6
1976	1661.6	908.7	734.7	18.5	104004	9.2	9.2	1662.0	1.1
1977	1273.7	555.6	716.4	18.4	103734	9.2	9.2	1290.5	1.4
1978	1346.7	529.5	799.7	18.4	103723	9.2	9.2	1347.7	1.4
1979	1166.6	389.9	761.6	18.5	104116	9.3	9.3	1170.0	1.6
1980	1220.9	550.2	660.9	18.6	104600	9.3	9.3	1229.7	1.5
1981	1473.5	723.3	716.1	18.7	104926	9.3	9.3	1458.1	1.3
1982	1015.4	392.4	630.1	18.8	105534	9.4	9.4	1041.2	1.8
1983	1287.7	557.0	698.6	18.7	105118	9.3	9.3	1274.2	1.5
1984	1419.5	736.2	655.4	19.0	106963	9.5	9.5	1410.6	1.3
1985	1031.8	353.9	679.4	19.0	106884	9.5	9.5	1052.3	1.8
1986	882.5	267.6	632.5	18.8	105939	9.4	9.4	918.9	2.1
1987	1004.9	373.6	628.6	18.7	104949	9.3	9.3	1020.9	1.9
1988	1552.9	772.0	742.8	18.8	105489	9.4	9.4	1533.6	1.2
Ave.	1284.5	592.1	677.6	18.4	103710	9.2	9.2	1288.2	1.5

* Deficit between (1) and (5) is supplied from the storage of the previous year and the surplus is added to the storage.

Table 5.2.1 MUNICIPALITIES POPULATION PROJECTION IN THE STUDY AREA

Municipality	Year 1961	1974	@(%)	1988	@(%)	1990	@(%)	1995	@(%)	2000
1. Comayagua	19,055	30,760	3.8	59,534	4.8	65,386	4.0	79,552	4.0	96,787
Rural	9,528	14,819	3.5	23,118	3.2	24,621	3.2	28,821	3.2	33,737
2. Ajuterique	3,132	5,126	3.9	6,803	2.0	7,078	2.0	7,815	2.0	8,628
3. Humuya	581	601	0.3	1,371	6.1/3.2	1,460	2.0	1,612	2.0	1,780
4. Lamani	2,844	2,850	0.0	3,572	1.6	3,687	1.6	3,992	1.6	4,322
5. Lejamani	1,455	2,127	3.0	3,123	2.8	3,300	2.8	3,789	2.8	4,350
6. San Sebastian	1,269	1,527	1.4	1,506	-0	1,506	1.0	1,583	1.0	1,664
7. Villa de San Antonio	4,408	6,169	2.6	11,429	4.5	12,480	4.0	15,184	4.0	18,474
8. La Paz	8,876	11,775	2.2	19,900	3.8	21,441	3.8	25,836	3.8	31,132
9. Cane	1,164	1,370	1.3	1,937	2.5	2,035	2.0	2,247	2.0	2,481
Total	42,784	62,305	2.9	109,175	4.1	118,373	3.6	141,610	3.6	169,618

Table 5.2.2 (1) RURAL POPULATION PROJECTION IN THE STUDY AREA (1/2)

Municipality		Year 1988	@(%)	1990	@(%)	1991	@(%)	1992	@(%)	1993	@(%)	1994	@(%)	1995	@(%)
1. Comayagua	(Total)	(59,534)		(65,386)		(68,001)		(70,721)		(73,550)		(76,492)		(79,552)	
	Rural	23,118	38.8	24,621	37.7	25,409	37.4	26,222	37.1	27,061	36.8	27,927	36.5	28,821	36.2
2. Ajuterique	(Total)	(6,803)		(7,078)		(7,220)		(7,364)		(7,511)		(7,662)		(7,815)	
	Rural	3,137	46.1	3,255	46.0	3,320	46.0	3,387	46.0	3,455	46.0	3,524	46.0	3,595	46.0
3. Humuya	(Total)	(1,371)		(1,460)		(1,489)		(1,519)		(1,549)		(1,580)		(1,612)	
	Rural	1,371	100.0	1,460	100.0	1,489	100.0	1,519	100.0	1,549	100.0	1,580	100.0	1,612	100.0
4. Lamani	(Total)	(3,572)		(3,687)		(3,746)		(3,806)		(3,867)		(3,929)		(3,992)	
	Rural	3,572	100.0	3,687	100.0	3,746	100.0	3,806	100.0	3,867	100.0	3,929	100.0	3,992	100.0
5. Lejamani	(Total)	(3,123)		(3,300)		(3,392)		(3,488)		(3,585)		(3,686)		(3,789)	
	Rural	326	10.4	330	10.0	340	10.0	349	10.0	360	10.0	370	10.0	380	10.0
6. San Sebastian	(Total)	(1,506)		(1,506)		(1,521)		(1,536)		(1,552)		(1,567)		(1,583)	
	Rural	1,506	100.0	1,506	100.0	1,521	100.0	1,536	100.0	1,552	100.0	1,567	100.0	1,583	100.0
7. Villa de San Anto.	(Total)	(11,429)		(12,480)		(12,979)		(13,498)		(14,038)		(14,600)		(15,184)	
	Rural	5,683	49.7	6,240	50.0	6,489	50.0	6,749	50.0	7,017	50.0	7,299	50.0	7,590	50.0
8. La Paz	(Total)	(19,900)		(21,441)		(22,256)		(23,101)		(23,979)		(24,890)		(25,836)	
	Rural	8,935	44.9	9,434	44.0	9,793	44.0	10,165	44.0	10,551	44.0	10,952	44.0	11,368	44.0
9. Cane	(Total)	(1,937)		(2,035)		(2,076)		(2,117)		(2,160)		(2,203)		(2,247)	
	Rural	1,937	100.0	2,035	100.0	2,076	100.0	2,117	100.0	2,160	100.0	2,203	100.0	2,247	100.0
Total Municipal.	(Total)	(109,175)		(118,373)		(122,681)		(127,152)		(131,792)		(136,610)		(141,610)	
	Rural	49,585	45.4	52,568	44.4	54,183	44.2	55,850	43.9	57,572	43.7	59,351	43.4	61,188	43.2

Table 5.2.2 (2) RURAL POPULATION PROJECTION IN THE STUDY AREA (2/2)

Municipality		Year 1996	@(%)	1997	@(%)	1998	@(%)	1999	@(%)	2000	@(%)
1. Comayagua	(Total)	(82,734)		(86,043)		(89,485)		(93,064)		(96,787)	
	Rural	29,743	36.0	30,695	35.7	31,677	35.4	32,690	35.1	33,737	34.9
2. Ajuterique	(Total)	(7,971)		(8,131)		(8,293)		(8,459)		(8,628)	
	Rural	3,667	46.0	3,740	46.0	3,815	46.0	3,892	46.0	3,969	46.0
3. Humuya	(Total)	(1,644)		(1,677)		(1,711)		(1,745)		(1,780)	
	Rural	1,644	100.0	1,677	100.0	1,711	100.0	1,745	100.0	1,780	100.0
4. Lamani	(Total)	(4,056)		(4,121)		(4,187)		(4,254)		(4,322)	
	Rural	4,056	100.0	4,121	100.0	4,187	100.0	4,254	100.0	4,322	100.0
5. Lejamani	(Total)	(3,895)		(4,004)		(4,116)		(4,232)		(4,350)	
	Rural	390	10.0	401	10.0	413	10.0	425	10.0	435	10.0
6. San Sebastian	(Total)	(1,599)		(1,615)		(1,631)		(1,647)		(1,664)	
	Rural	1,599	100.0	1,615	100.0	1,631	100.0	1,647	100.0	1,664	100.0
7. Villa de San Anto.	(Total)	(15,791)		(16,423)		(17,080)		(17,763)		(18,474)	
	Rural	7,895	50.0	8,211	50.0	8,539	50.0	8,879	50.0	9,237	50.0
8. La Paz	(Total)	(26,818)		(27,837)		(28,894)		(29,992)		(31,132)	
	Rural	11,528	43.0	11,966	43.0	12,420	43.0	12,894	43.0	13,075	42.0
9. Cane	(Total)	(2,292)		(2,338)		(2,385)		(2,432)		(2,481)	
	Rural	2,292	100.0	2,338	100.0	2,385	100.0	2,432	100.0	2,481	100.0
Total Municipal.	(Total)	(146,801)		(152,189)		(157,782)		(163,589)		(169,618)	
	Rural	62,814	42.8	64,764	42.6	66,778	42.3	68,858	42.1	70,700	41.7

Table 5.2.3 PROJECTED SERVED POPULATION FOR RURAL WATER SUPPLY SYSTEM IN STUDY AREA

Year	Projected Rural Population Total	Projected Served Population	(%)
1988	49,585	10,000[1/] (approx.)	(17)
1990	52,568	(10,000)	
1993	57,572	51,800	(90)
1996	62,814	56,500	(90)
2000	70,700	63,600	(90)

Note: 1/ Ref. Table 1.2.1 PRESENT WATER SUPPLIES IN STUDY AREA

Table 5.2.4 PRESENT AND FUTURE WATER DEMANDS

Year	Served Population	Water Demands (m^3/d)	Water consumption per capita (l/d)
1989/1990	10,000	(250*)	(25)
1993	51,800	2,590	50
1996	56,500	4,520	80
2000	63,600	6,360	100

Note: * Potential demand supposing 25 LPCD

Table 5.3.1 (1) PLANNED AREA AND TYPE OF RURAL WATER SUPPLY SYSTEM (1/2)

No.	Community	No. of House-holds	Popula-tion	Type and No. of system 1st Stage	2nd Stage	Dimension & Nos. of Production Wells 4"x50m	4"x100m	6"x50m	6"x100m
<<< Comayagua >>>									
1.	Cacaguapa	74	425	I * 15	---	15	-	-	-
2.	El Roblito	66	434	I * 15	---	15	-	-	-
3.	Los Empates & El Yamboral	40	218	---	I * 10	10	-	-	-
4.	El Motatal	31	182	---	III * 1	-	-	1	-
5.	El Sauce	90	375	III * 1, I * 1	---	1	-	1	-
6.	Piedras Azules			III * 1, I * 1	---	1	-	1	-
7.	Palo Pintado	161	955	III * 1	III * 1	-	-	2	-
8.	Valle de Angeles	145	720	III * 2, I * 2	II * 1	2	-	3	-
9.	Escuela Normal & El Pajonal	4	31	I * 2	---	2	-	-	-
10.	Mata de Cana	27	263	---	III * 1	-	-	1	-
11.	La Zarcita	218	965	III * 1	---	-	-	1	-
12.	Grupo Benito Cadena	12	84	I * 1	---	1	-	-	-
13.	Ojo de Agua	97	497	III * 1, I * 2	II * 2	2	-	3	-
14.	Puente Selguapa, El Pajonal No.1 & El Porvenir	84	503	III * 1, I * 2	---	2	-	1	-
15.	El Taladro	56	368	---	III * 1	-	-	1	-
16.	Jarin & Asenta-miento Barrio	28	193	III * 1, I * 2	---	2	-	1	-
17.	La Jaguita	55	405	III * 1, I * 1	---	1	-	1	-
18.	El Paraiso	35	204	III * 1, I * 1	---	1	-	1	-
19.	Col. Nueva Espe-ranze & Capiro	70	446	III * 2, I * 2	---	2	-	2	-
20.	San Isidro & the suburbs of Comayagua			---	III * 4	-	-	4	-
	Not Specified Area in Comayagua			---	I * 10	10	-	-	-
	Total (Comayagua)			I * 47	I * 20	67	-	-	-
				II * 0	II * 3	-	-	3	-
				III * 13	III * 8	-	-	21	-

Table 5.3.1 (2) PLANNED AREA AND TYPE OF RURAL WATER SUPPLY SYSTEM (2/2)

No.	Community	No. of House-holds	Popula-tion	Type and No. of system 1st Stage	2nd Stage	Dimension & Nos. of Production Wells 4"x50m	4"x100m	6"x50m	6"x100m
<< La Paz >>>									
11.	Las Cascabeles	24	153	I * 1	III * 1	1	-	1	-
12.	Lo de Reina	29	208	I * 1	III * 1	1	-	1	-
13.	Playitas			III * 1, I * 4	II * 3	4	-	4	-
14.	Las Liconas	86	298	---	II * 2	-	-	2	-
15.	Las Pozos, Los Capantillos & Las Paredos	22	221	III * 1, I * 1	---	1	-	1	-
16.	Pacon & El Sifon	46	258	III * 1, I * 2	---	2	-	1	-
17.	Camino Nuevo	46	141	---	III * 1	-	-	1	-
18.	San Jose	44	227	III * 1	---	-	-	-	1
19.	Las Mecedes & El Varillal	111	519	III * 1	---	-	-	1	-
20.	Humuya	91	400	III * 1	---	-	-	-	1
21.	La Vajilla			---	III * 1	-	-	1	-
22.	Agua Salada			---	III * 1	-	-	-	1
23.	Los Pintores & Choco	326	1749	III * 2, I * 2	III * 1	-	2	-	3
24.	Lamani			---	III * 1	-	-	-	1
25.	El Paraiso	40	176	III * 1, I * 2	---	-	2	-	1
26.	El Sonzapote	7	50	---	II * 1	-	-	-	1
27.	El Mesetas	7	29	---	II * 1	-	-	-	1
	Total (La paz)			I * 13	I * 0	9	4	-	-
				II * 0	II * 7	-	-	5	2
				III * 9	III * 7	-	-	8	8
		Total							
	Ground Total	I * 80		I * 60	I * 20	76	4	-	-
		II * 10		II * 0	II * 10	-	-	8	2
		III * 37		III * 22	III * 15	-	-	29	8
					Total	76	4	37	10

Table 5.4.1 BREAKDOWN OF CONSTRUCTION COST

Unit: Lps 10^3

Item	1st Stage FC	1st Stage LC	1st Stage total	2nd Stage FC	2nd Stage LC	2nd Stage total	Total of 1st & 2nd Stage FC	Total of 1st & 2nd Stage LC	Total of 1st & 2nd Stage total
Direct Construction Cost									
Well Drilling	7,996	876	8,872	2,496	681	3,177	10,492	1,557	12,049
Pipe & facility installation	4,112	4,545	8,657	3,497	3,301	6,798	7,609	7,846	15,455
Work shop & Mainte. Equip.	992	0	992	183	0	183	1,175	0	1,175
sub-total	13,100	5,421	18,521	6,176	3,982	10,158	19,276	9,403	28,680
Engineering & Administration	1,619	268	1,887	1,382	235	1,617	3,001	503	3,504
Physical Contingency	2,208	853	3,061	1,133	632	1,765	3,341	1,485	4,826
Total	16,927	6,542	23,469	8,691	4,849	13,540	25,618	11,391	37,010
Price Contingency	4,232	2,177	6,409	6,390	4,163	10,553	10,622	6,340	16,962
Grand Total	21,159	8,719	29,878	15,081	9,012	24,093	36,240	17,731	53,972

Table 5.4.2 ANNUAL DISBURSEMENT SCHEDULE

I. 1st Stage

Unit: Lps 10^3

Item	Total		1990		1991		1992		1993	
	FC	LC	FC	LC	FC	LC	FC	LC	FC	LC
Direct Construction Cost	13,100	5,421	0	0	10,361	1,355	1,826	2,711	913	1,355
Engineering & Administration	1,619	268	277	29	335	60	671	119	336	60
sub-total	14,719	5,688	277	29	10,696	1,415	2,497	2,830	1,249	1,415
Physical Contingency	2,208	853	41	4	1,605	212	375	425	187	212
Total	16,927	6,542	318	33	12,301	1,627	2,872	3,255	1,436	1,627
Price Contingency	4,232	2,177	32	3	2,583	342	951	1,077	666	755
Ground Total	21,159	8,719	350	36	14,884	1,969	3,823	4,332	2,102	2,382

II. 2nd Stage

Unit: Lps 10^3

Item	Total		1990		1991		1992	
	FC	LC	FC	LC	FC	LC	FC	LC
Direct Construction Cost	6,176	3,982	3,506	0	1,335	1,991	1,335	1,991
Engineering & Administration	1,382	235	276	29	553	103	553	103
sub-total	7,558	4,216	3,782	29	1,888	2,094	1,888	2,094
Physical Contingency	1,133	632	567	4	283	314	283	314
Total	8,691	4,849	4,349	33	2,171	2,408	2,171	2,408
Price Contingency	6,390	4,163	2,655	20	1,675	1,858	2,060	2,285
Ground Total	15,081	9,012	7,004	53	3,846	4,266	4,231	4,693

Table 5.4.3 OPERATION AND MAINTENANCE COST

Unit: Lps 10^3

Year in Order	Year	O&M Cost		Replacement Cost	Residual Value of Equipment	Total
		Facilities and others	Supporting Vehicles			
1	1990	0	0	0	0	0
2	1991	0	0	0	0	0
3	1992	113	0	0	0	113
4	1993	241	0	0	0	241
5	1994	315	0	0	0	315
6	1995	315	0	0	0	315
7	1996	419	0	0	(1,056)	419
8	1997	524	0	0	0	524
9	1998	524	90	0	0	614
10	1999	524	90	0	0	614
11	2000	524	90	0	0	614
12	2001	524	90	0	0	614
13	2002	524	90	0	0	614
14	2003	524	90	0	0	614
15	2004	524	90	0	0	614
16	2005	524	90	0	0	614
17	2006	449	90	839	0	1,378
18	2007	449	90	1,057	0	1,596
19	2008	449	90	97	0	636
20	2009	524	90	0	0	614
21	2010	512	90	999	0	1,601
22	2011	512	90	842	0	1,444
23	2012	524	90	0	0	614
24	2013	524	90	0	0	614
25	2014	524	90	0	0	614
26	2015	524	90	0	0	614
27	2016	524	90	0	0	614
28	2017	524	90	0	0	614
29	2018	524	90	0	0	614
30	2019	524	90	0	0	614

Table 5.5.1 WATER BORNE DISEASE CASES AND POPULATION WITHOUT SAFE WATER AND SAFE SANITATION IN DEVELOPING COUNTRIES IN 1985

Countries	Water borne disease cases per 100,000	Population without safe water(%)	Population without safe sanitation(%)
Honduras	4,462	55	72
Mexico	6,566	30	51
Peru	900	48	53
Chile	186	14	15
Guatemala	672	42	46
El Salvador	10,250	39	46
Paraguay	1,146	78	51
Costa Rica	8	7	5
Guyana	634	18	90
Madagascar	6,900	69	87
Angola	3,607	69	81
Burkina Faso	5,007	36	88
Rwanda	2,872	51	44
Lesatho	31	65	85
Guinea Bissau	3,500	79	79
Cape Verde	5,070	37	82
Sao Tome & Pricipe	6,000	86	98
Burma	968	73	76
Sri Lanka	1,024	60	56
Hangary	7	1	0
Portugal	13	42	48
Pakistan	315	57	81
Morocco	11	42	64
Afghanistan	2,214	80	99
Yemen Arab Republic	3,784	65	92
Tunisia	60	30	48
Philippines	785	48	33
Malaysia	410	17	26
Papua New Guinea	2,724	75	57
Tonga	3,015	5	0
Tuvalu	4,520	0	25

Source : The International Drinking Water Supply and Sanitation Decade, Review of Mid-Decade Progress (as at December 1985), WHO

Table 5.5.2 ANNUAL FLOW OF ECONOMIC COST AND BENEFIT

Unit: 10^3 Lps.

	Year	Economic Cost			Economic Benefit
		Construction cost	OMR cost	Total	
1.	1990	345	0	345	0
2.	1991	13,644	0	13,644	0
3.	1992	5,559	95	5,654	992
4.	1993	2,779	206	2,985	2,151
5.	1994	4,376	269	4,645	2,809
6.	1995	4,158	269	4,427	2,809
7.	1996	4,158	357	4,515	4,288 *1
8.	1997	0	447	447	4,083
9.	1998	0	524	524	4,083
	.	.	.	.	.
	.	.	.	.	.
	.	.	.	.	.
16.	2005	0	524	524	4,083
17.	2006	0	1,299	1,299	4,083
18.	2007	0	1,517	1,517	4,083
19.	2008	0	557	557	4,083
20.	2009	0	524	524	4,083
21.	2010	0	1,513	1,513	4,083
22.	2011	0	1,356	1,356	4,083
23.	2012	0	524	524	4,083
	.	.	.	.	.
	.	.	.	.	.
	.	.	.	.	.
30.	2019	0	524	524	4,083

Note: *1 includes residual value of Lps. 1,056 thousand

Table 6.2.1 COMPONENT OF WATER SUPPLY FACILITIES

Component	Unit	Quantity 1st. stage	2nd. stage	Total
1. D 4" Deep well, equiped with sylinder type head pump				
Type I D 4" * 50 m	unit	56	20	76
D 4" * 100 m	unit	4	0	4
total		60	20	80
2. D 6" Deep well, equiped with electric motor pump				
Type II D 6" * 50 m	unit	0	8	8
D 6" * 100 m	unit	0	2	2
Type III D 6" * 50 m	unit	17	12	29
D 6" * 100 m	unit	5	3	8
total		22	25	47
3. Elevated FRP water tank V 20 m^3, H 8 m, with suppoting strucrure	unit	22	7	29
4. FRP water tank V 8 m^3, H 3 m	unit	32	43	75
5. Public bath house	unit	54	50	104
6. Public stand pipe	unit	100	50	150
7. Distribution pipes				
D 80 mm	m	14,200	8,400	22,600
D 40 mm	m	24,500	10,500	35,000
Miscellaneous works	lot	1	1	2