II-2. Alternativa-2, Grupo Occidental

Disminución de los Beneficios	Aumento del Costo 0%	5%	10%
0%	12,51	11,82	11,19
5%	11,79	11,13	10,53
10%	11,06	10,43	9,85

Como se muestra, el TIRE de la Alternativa-2 del grupo oriental y la Alternativa-1 del grupo occidental mantienen cifras de 11,17% y 10,62%, lo cual indica su factibilidad económica, incluso en casos desfavorables, en los cuales el incremento del costo y la disminución de beneficios es alrededor del 10%.

El TIRE de la Alternativa-2 del grupo occidental se mantiene sobre el 10%, lo cual muestra su factibilidad económica en condiciones combinadas de aumento del 10% de los costos y de disminución del 5% de los beneficios, o para el caso de 5% de aumento de costos y del 10% de disminución de beneficios. Sin embargo, el TIRE disminuye a 9,8% en una condición combinada de aumento del 10% de los costos y disminución del 10% de los beneficios.

El TIRE de la Alternativa-1 del grupo oriental disminuye a 9,6%, lo cual no le permite obtener un nivel de factibilidad económica, en el caso de aumento del 5% de los costos o de disminución del 5% de los beneficios. Esto se debe principalmente al TIRE negativo del proyecto del Río Chané.

5. Resúmen de la Evaluación del Proyecto

5.1 Efectos Directos

A. Proyectos Individuales

De los siete proyectos individuales, sólo el proyecto de San Juan tiene dos planes; Alternativa-1 y -2. La evaluación económica de los proyectos individuales se resúme de la manera siguiente:

(1) Cinco proyectos, los del Río Pailón, Quebrada Chané, Chané Chacras, Drenaje de Okinawa y Antofagasta, son económicamente factibles. Especialmente, se espera que tres proyectos, los de Antofagasta, Chané Chacras y Río Pailón tengan un importante retorno económico mediante la implementación de estos proyectos.

(2) El proyecto de San Juan se puede considerar que es factible, desde el punto de vista socio-económico, ya que es muy útil para mejorar el aspecto ambiental y puede esperarse un efecto económico indirecto relativamente elevado, debido a la significativa inversión. Este aspecto es aplicable tanto a la Alternativa-1 como a la -2.

(3) El proyecto del Río Chané se considera económicamente no factible, ya que tiene TIRE y VPN negativos.

B. Proyectos Combinados

De acuerdo con las condiciones geográficas del área de estudio, los siete proyectos pueden dividirse en dos grupos, el grupo oriental y el grupo occidental. El grupo oriental está compuesto por cinco proyectos, los de Río Chané, Río Pailón, Quebrada Chané, Chané Chacras y Drenaje de Okinawa. El grupo occidental consiste de dos proyectos, los de San Juan y Antofagasta. El proyecto del Río Chané esta excluido de la Alternativa-2. A continuación se hace un resúmen de la evaluación económica de cada grupo:

(1) Los proyectos combinados son económicamente factibles para la Alternativa-2 del grupo oriental y para la Alternativa-1 del grupo occidental.

(2) De acuerdo con la prueba de sensibilidad, el TIRE de la Alternativa-1 del grupo oriental, disminuye a 9,6% en caso de incremento del costo en 5% o de disminución en 5% de los beneficios. También, en caso de la Alternativa-2 del grupo occidental, éste parámetro pasa a ser 9,8% en caso de presentarse en forma combinada los aumentos del costo del 10% y disminución de beneficios del 10%.

(3) Sin embargo, a pesar de que los dos grupos no se atienen a la norma de factibilidad económica para ciertos casos especiales, se consideran a estos proyectos como factibles, desde el punto de vista socio-económico, tomando en consideración que son muy útiles para mejorar el ambiente y puede esperarse de ellos un retorno económico relativamente elevado debido a la significativa inversión.

5.2 Efectos Indirectos

Además de los efectos directos anteriores, se espera que los proyectos produzcan los siguientes efectos indirectos y/o intangibles:

(1) Se espera que los proyectos contribuyan a una mejora de las condiciones sociales y económicas en el Area de Estudio a través de : 1) interrupción del tráfico y de las comunicaciones, 2) aumento de trabajadores con empleo, 3) reducción de enfermedades, 4) mejora de la calidad de las cosechas, 5) reducción de los costos de producción en fábricas y tierras agrícolas y 6) disminución de los precios al consumidor.

(2) Se espera que los proyectos tengan un impacto estimulante en el desarrollo de la economía regional debido a la inversión de importantes fondos.

TABLAS

TABLA K.1.1 CALUCULO DEL FACTOR ESTANDAR DE CONVERSION

Items	1990	1991	1992	1993	1994	Average
Imports (US$ Million)	527.7	1,000.1	1,235.0	1,429.4	1,306.8	1099.8
Import Duty (US$ Million)	133.4	224.2	299.2	321.0	383.2	272.2
Total	661.1	1,224.3	1,534.2	1,750.4	1,690.0	1,372.0
Rate of Import Duty (%)	25.3	22.4	24.2	22.5	29.3	24.7
Exports (US$ Million)	926.8	848.5	712.3	754.5	722.9	793.0
Export Duty (US$ Million)	0.0	0.0	0.0	0.0	0.0	0.0
Total	926.8	848.5	712.3	754.5	722.9	793.0
SCR (%)	91.6	89.2	86.7	87.2	84.1	87.8

Average SCR of Bolivia : 88 %

TABLA K.2.1(1) CANTIDAD Y AREA DE LOS BIENES INUNDADOS EN EL RIO CHANE (SIN PROYECTO)

(1) 2-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	2	20	14	2	0	0	0	0	0	0	38	254	52	348	24	12	27	717
2	0.25-0.5	2	28	19	2	0	1	0	0	0	0	52	358	73	491	33	17	37	1,009
3	0.5-1.0	3	31	21	3	0	1	0	0	0	0	59	397	81	545	37	19	42	1,121
4	1.0-1.5	1	8	5	1	0	0	0	0	0	0	15	105	21	143	10	5	11	295
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	8	87	59	8	0	2	0	0	0	0	164	1,114	227	1,527	104	53	117	3,142

(2) 5-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	2	20	13	2	0	0	0	0	0	0	37	250	51	342	23	12	26	704
2	0.25-0.5	2	20	13	2	0	0	0	0	0	0	37	250	51	342	23	12	26	704
3	0.5-1.0	5	51	35	5	0	1	1	0	0	0	98	657	134	900	61	32	69	1,853
4	1.0-1.5	2	17	11	2	0	0	0	0	0	0	32	218	44	299	20	11	23	615
5	1.5-2.0	0	2	2	0	0	0	0	0	0	0	4	30	6	42	3	1	3	85
	Total	11	110	74	11	0	1	1	0	0	0	208	1,405	286	1,925	130	68	147	3,961

(3) 10-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	0	4	3	0	0	0	0	0	0	0	7	50	10	68	5	2	5	140
2	0.25-0.5	2	20	13	2	0	0	0	0	0	0	37	250	51	342	23	12	26	704
3	0.5-1.0	4	48	33	5	0	1	1	0	0	0	92	621	127	851	58	30	65	1,752
4	1.0-1.5	3	32	22	3	0	1	0	0	0	0	61	418	85	572	39	20	44	1,178
5	1.5-2.0	1	8	5	1	0	0	0	0	0	0	15	96	20	131	9	5	10	271
	Total	10	112	76	11	0	2	1	0	0	0	212	1,435	293	1,964	134	69	150	4,045

(4) 20-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0.25-0.5	1	7	5	1	0	0	0	0	0	0	14	90	18	123	8	4	9	252
3	0.5-1.0	4	44	30	4	0	1	1	0	0	0	84	560	114	768	53	27	59	1,581
4	1.0-1.5	4	49	33	5	0	1	1	0	0	0	93	627	128	860	59	31	66	1,771
5	1.5-2.0	1	12	8	1	0	0	0	0	0	0	22	157	32	215	14	8	16	442
	Total	10	112	76	11	0	2	2	0	0	0	214	1,434	292	1,966	134	70	150	4,046

(5) 50-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0.25-0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0.5-1.0	2	24	16	2	0	1	0	0	0	0	45	310	63	424	29	15	32	873
4	1.0-1.5	5	55	37	5	0	1	1	0	0	0	104	704	144	965	66	34	74	1,987
5	1.5-2.0	3	33	22	3	0	1	0	0	0	0	62	421	86	576	39	21	44	1,187
	Total	10	112	75	10	0	3	1	0	0	0	211	1,435	293	1,965	134	70	150	4,047

TABLA K.2.1(2) CANTIDAD Y AREA DE LOS BIENES INUNDADOS EN EL RIO CHANE (CON PROYECTO)

(1) 2-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugarcane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	2	20	13	2	0	0	0	0	0	0	37	249	51	342	23	12	26	703
2	0.25-0.5	2	24	16	2	0	0	0	0	0	0	44	303	62	416	28	15	32	856
3	0.5-1.0	2	17	11	2	0	0	0	0	0	0	32	218	44	299	20	11	23	615
4	1.0-1.5	1	11	8	1	0	0	0	0	0	0	21	144	29	197	14	7	15	406
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	7	72	48	7	0	0	0	0	0	0	134	914	186	1,254	85	45	96	2,580

(2) 5-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugarcane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	2	20	13	2	0	0	0	0	0	0	37	249	51	342	23	12	26	703
2	0.25-0.5	2	20	13	2	0	0	0	0	0	0	37	249	51	342	23	12	26	703
3	0.5-1.0	4	40	27	4	0	1	1	0	0	0	77	513	105	704	48	25	51	1,419
4	1.0-1.5	2	17	11	2	0	0	0	0	0	0	32	218	44	299	20	11	23	615
5	1.5-2.0	1	9	6	1	0	0	0	0	0	0	18	113	23	155	11	6	12	320
	Total	11	106	70	11	0	1	1	0	0	0	201	1,342	274	1,842	125	66	141	3,790

(3) 10-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugarcane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	0	4	3	0	0	0	0	0	0	0	7	60	12	82	6	3	6	169
2	0.25-0.5	2	20	13	2	0	0	0	0	0	0	37	250	51	342	23	12	26	704
3	0.5-1.0	4	42	29	4	0	1	1	0	0	0	81	538	110	738	50	26	56	1,518
4	1.0-1.5	3	32	22	3	0	1	0	0	0	0	61	408	83	559	38	20	43	1,151
5	1.5-2.0	1	14	9	1	0	0	0	0	0	0	25	179	36	245	17	9	19	505
	Total	10	112	76	10	0	2	1	0	0	0	211	1,435	292	1,966	134	70	150	4,047

(4) 20-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugarcane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0.25-0.5	1	8	5	1	0	0	0	0	0	0	15	100	20	137	9	5	10	281
3	0.5-1.0	3	39	26	4	0	1	1	0	0	0	74	499	102	684	47	24	52	1,408
4	1.0-1.5	4	43	29	4	0	1	1	0	0	0	82	547	112	750	51	27	57	1,544
5	1.5-2.0	2	23	15	2	0	0	0	0	0	0	42	288	59	394	27	14	30	812
	Total	10	113	75	11	0	2	2	0	0	0	213	1,434	293	1,965	134	70	149	4,045

(5) 50-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugarcane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0.25-0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0.5-1.0	3	30	21	3	0	1	0	0	0	0	58	389	79	534	36	19	41	1,098
4	1.0-1.5	3	39	26	4	0	1	1	0	0	0	74	499	102	684	47	24	52	1,408
5	1.5-2.0	4	43	29	4	0	1	1	0	0	0	83	545	111	748	51	27	57	1,539
	Total	10	112	76	11	0	3	2	0	0	0	215	1,433	292	1,966	134	70	150	4,045

TABLA K.2.2(1) CANTIDAD Y AREA DE LOS BIENES INUNDADOS EN EL RIO PAILON (SIN PROYECTO)

(1) 2-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugarcane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	12	36	42	5	1	1	0	1	0	1	97	2,223	453	474	208	249	534	4,141
2	0.25-0.5	9	28	33	4	0	1	0	1	0	0	75	1,764	360	377	166	197	424	3,288
3	0.5-1.0	18	53	62	7	1	1	1	1	0	1	144	3,317	676	708	311	371	797	6,180
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	39	117	137	15	1	3	1	2	0	1	316	7,304	1,489	1,559	685	817	1,755	13,609

(2) 5-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugarcane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	4	13	15	1	0	0	0	0	0	0	33	771	157	165	72	86	185	1,436
2	0.25-0.5	9	27	32	4	0	1	0	1	0	0	74	1,693	345	361	158	190	407	3,154
3	0.5-1.0	18	57	67	8	1	1	1	1	0	1	153	3,528	719	753	330	395	847	6,572
4	1.0-1.5	10	29	34	4	0	1	0	1	0	0	79	1,835	374	392	172	205	441	3,419
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	41	126	148	17	1	3	1	2	0	1	339	7,827	1,595	1,671	732	876	1,880	14,581

(3) 10-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugarcane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	5	15	18	2	0	0	0	0	0	0	39	931	190	199	87	104	224	1,735
2	0.25-0.5	1	4	4	1	0	0	0	0	0	0	10	223	46	48	21	25	54	417
3	0.5-1.0	18	57	67	8	1	1	1	1	0	1	153	3,528	719	753	330	395	847	6,572
4	1.0-1.5	18	55	65	8	1	1	1	1	0	1	150	3,457	705	738	324	387	830	6,441
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	43	130	153	18	1	3	1	1	0	1	353	8,139	1,660	1,738	762	911	1,955	15,165

(4) 20-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugarcane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	6	16	20	2	0	1	0	0	0	0	44	1,025	209	219	96	115	246	1,910
2	0.25-0.5	2	6	7	1	0	0	0	0	0	0	16	389	79	83	36	43	93	723
3	0.5-1.0	11	35	41	5	1	1	0	1	0	1	95	2,187	446	467	205	245	525	4,075
4	1.0-1.5	18	57	67	8	1	1	1	1	0	1	153	3,528	719	753	330	395	847	6,572
5	1.5-2.0	7	22	25	3	0	1	0	1	0	0	58	1,341	273	286	125	150	322	2,497
	Total	44	136	160	18	1	4	1	2	0	1	367	8,470	1,726	1,808	792	948	2,033	15,777

(5) 50-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugarcane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	6	16	20	2	0	1	0	0	0	0	44	1,025	209	219	96	115	246	1,910
2	0.25-0.5	4	12	14	1	0	0	0	0	0	0	32	755	154	161	71	85	181	1,407
3	0.5-1.0	2	6	8	1	0	0	0	0	0	0	17	413	84	88	39	46	99	769
4	1.0-1.5	18	57	67	8	1	1	1	1	0	1	153	3,528	719	753	330	395	847	6,572
5	1.5-2.0	17	52	61	7	1	1	1	1	0	1	141	3,246	662	693	304	363	779	6,047
	Total	47	143	169	19	1	4	1	1	0	1	386	8,967	1,828	1,914	840	1,004	2,152	16,705

TABLA K.2.2(2) CANTIDAD Y AREA DE LOS BIENES INUNDADOS EN EL RIO PAILON (CON PROYECTO)

(1) 2-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugarcane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	3	8	9	1	0	0	0	0	0	0	21	497	101	106	47	56	119	926
2	0.25-0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0.5-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	3	8	9	1	0	0	0	0	0	0	21	497	101	106	47	56	119	926

(2) 5-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugarcane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	8	23	27	3	0	1	0	1	0	0	62	1,446	295	309	136	162	347	2,695
2	0.25-0.5	1	2	3	0	0	0	0	0	0	0	6	130	27	28	12	15	31	243
3	0.5-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	8	25	30	3	0	1	0	1	0	0	68	1,576	322	337	148	177	378	2,938

(3) 10-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugarcane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	14	43	50	6	1	1	0	1	0	1	116	2,675	545	571	250	299	642	4,982
2	0.25-0.5	2	7	8	1	0	0	0	0	0	0	18	418	85	89	39	47	100	778
3	0.5-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	16	50	58	6	1	1	0	1	0	1	133	3,093	630	660	289	346	742	5,760

(4) 20-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugarcane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	15	45	53	6	1	1	0	1	0	1	121	2,792	569	596	261	312	670	5,200
2	0.25-0.5	11	34	39	4	1	1	0	1	0	1	91	2,096	427	447	196	235	503	3,904
3	0.5-1.0	0	1	1	0	0	0	0	0	0	0	1	43	9	9	4	5	10	80
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	26	79	92	11	1	1	0	1	0	1	214	4,931	1,005	1,052	461	552	1,183	9,184

(5) 50-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugarcane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	15	45	53	6	1	1	0	1	0	1	121	2,792	569	596	261	312	670	5,200
2	0.25-0.5	13	40	47	6	1	1	0	1	0	1	109	2,502	510	534	235	280	601	4,662
3	0.5-1.0	8	27	32	4	0	1	0	1	0	0	71	1,672	341	357	156	187	402	3,115
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	36	111	131	15	1	2	0	2	0	1	301	6,966	1,420	1,487	652	779	1,673	12,977

TABLA K.2.3(1) CANTIDAD Y AREA DE LOS BIENES INUNDADOS EN EL QUEBRADA CHANE (SIN PROYECTO)

(1) 2-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	6	30	90	10	1	1	0	1	0	0	138	130	27	1,865	12	73	158	2,265
2	0.25-0.5	4	20	61	6	0	1	0	0	0	0	92	89	18	1,273	8	50	108	1,546
3	0.5-1.0	3	14	42	4	0	1	0	0	0	0	64	62	13	881	6	35	75	1,072
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	13	64	193	20	1	2	0	1	0	0	294	281	58	4,019	26	158	341	4,883

(2) 5-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	8	38	112	12	1	1	0	1	0	0	172	164	33	2,347	16	92	198	2,850
2	0.25-0.5	6	27	79	8	0	1	0	1	0	0	121	115	23	1,648	11	65	139	2,001
3	0.5-1.0	6	28	83	9	0	1	0	1	0	0	127	120	25	1,724	11	68	146	2,094
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	19	92	274	29	1	2	0	2	0	0	419	399	81	5,719	38	225	483	6,945

(3) 10-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	9	43	126	13	1	1	0	1	0	0	193	184	38	2,637	17	104	223	3,203
2	0.25-0.5	7	32	94	10	1	1	0	1	0	0	144	137	28	1,957	13	77	165	2,377
3	0.5-1.0	8	41	120	13	1	1	0	1	0	0	183	175	36	2,500	16	98	211	3,036
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	25	115	340	36	2	3	0	2	0	0	522	496	102	7,094	46	279	599	8,616

(4) 20-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	8	37	109	12	1	1	0	1	0	0	168	159	32	2,282	15	90	193	2,771
2	0.25-0.5	8	35	104	11	1	1	0	1	0	0	160	151	31	2,162	14	85	183	2,626
3	0.5-1.0	11	50	148	15	1	1	0	1	0	0	226	215	44	3,080	20	121	260	3,740
4	1.0-1.5	1	6	19	2	0	0	0	0	0	0	29	28	6	396	3	16	33	482
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	27	128	379	41	2	3	0	2	0	0	582	553	113	7,920	52	312	669	9,619

(5) 50-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	6	27	80	8	0	1	0	1	0	0	123	117	24	1,670	11	66	141	2,029
2	0.25-0.5	8	39	113	12	1	1	0	1	0	0	174	165	34	2,367	16	93	200	2,875
3	0.5-1.0	12	57	171	18	1	1	1	1	0	0	262	249	51	3,562	24	140	301	4,327
4	1.0-1.5	4	18	53	6	0	1	0	0	0	0	80	77	16	1,096	8	43	93	1,333
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	29	141	417	43	1	4	1	2	0	0	638	608	125	8,695	59	342	735	10,561

TABLA K.2.3(2) CANTIDAD Y AREA DE LOS BIENES INUNDADOS EN EL QUEBRADA CHANE (CON PROYECTO)

(1) 2-Year Return Period

No.	Water Depth (m)	Buildings											Agricultural Crops (ha)						
		Residence			Shop	Restau-rant	School	Church	Factory	Hospital	Health Center	Total	Soy-beans	Rice	Sugar cane	Maize	Pasture		Tota
		High	Medium	Low													Nutural	Improved	
1	0.0-0.25	4	16	48	5	0	1	0	0	0	0	74	71	14	1,015	6	40	86	1,23
2	0.25-0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(
3	0.5-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(
	Total	4	16	48	5	0	1	0	0	0	0	74	71	14	1,015	6	40	86	1,23

(2) 5-Year Return Period

No.	Water Depth (m)	Buildings											Agricultural Crops (ha)						
		Residence			Shop	Restau-rant	School	Church	Factory	Hospital	Health Center	Total	Soy-beans	Rice	Sugar cane	Maize	Pasture		Tota
		High	Medium	Low													Nutural	Improved	
1	0.0-0.25	6	27	78	8	0	1	0	1	0	0	120	114	23	1,638	11	65	138	1,98
2	0.25-0.5	1	6	17	1	0	0	0	0	0	0	25	24	5	344	2	14	29	41
3	0.5-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(
	Total	7	32	95	10	0	1	0	1	0	0	146	138	28	1,982	13	79	167	2,40

(3) 10-Year Return Period

No.	Water Depth (m)	Buildings											Agricultural Crops (ha)						
		Residence			Shop	Restau-rant	School	Church	Factory	Hospital	Health Center	Total	Soy-beans	Rice	Sugar cane	Maize	Pasture		Tota
		High	Medium	Low													Nutural	Improved	
1	0.0-0.25	8	36	109	11	1	1	0	1	0	0	166	158	32	2,262	14	89	191	2,74
2	0.25-0.5	4	17	49	5	0	1	0	0	0	0	75	72	15	1,024	6	40	87	1,24
3	0.5-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(
	Total	11	53	158	16	1	1	0	1	0	0	241	230	47	3,286	20	129	278	3,99

(4) 20-Year Return Period

No.	Water Depth (m)	Buildings											Agricultural Crops (ha)						
		Residence			Shop	Restau-rant	School	Church	Factory	Hospital	Health Center	Total	Soy-beans	Rice	Sugar cane	Maize	Pasture		Tota
		High	Medium	Low													Nutural	Improved	
1	0.0-0.25	9	42	125	13	1	1	0	1	0	0	192	182	37	2,608	17	103	221	3,16
2	0.25-0.5	5	22	67	7	0	1	0	0	0	0	102	97	20	1,383	9	54	117	1,68
3	0.5-1.0	1	4	11	1	0	0	0	0	0	0	16	15	3	212	2	8	18	25
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(
	Total	15	68	202	22	1	2	0	1	0	0	309	294	60	4,203	28	165	356	5,10

(5) 50-Year Return Period

No.	Water Depth (m)	Buildings											Agricultural Crops (ha)						
		Residence			Shop	Restau-rant	School	Church	Factory	Hospital	Health Center	Total	Soy-beans	Rice	Sugar cane	Maize	Pasture		Tota
		High	Medium	Low													Nutural	Improved	
1	0.0-0.25	9	44	131	14	1	1	0	1	0	0	201	191	39	2,728	18	107	231	3,31
2	0.25-0.5	6	29	86	9	1	1	0	1	0	0	132	125	26	1,793	11	71	152	2,17
3	0.5-1.0	3	13	40	4	0	0	0	0	0	0	60	58	12	832	5	33	70	1,01
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	18	86	257	27	1	2	0	1	0	0	393	374	77	5,353	34	211	453	6,50

TABLA K.2.4(1) CANTIDAD Y AREA DE LOS BIENES INUNDADOS EN EL CHANE CHACRAS (SIN PROYECTO)

(1) 2-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	5	42	74	8	0	1	0	0	0	0	131	31	7	2,896	3	150	321	3,407
2	0.25-0.5	5	42	74	8	0	1	0	0	0	0	131	31	7	2,896	3	150	321	3,407
3	0.5-1.0	5	39	69	7	0	1	0	0	0	0	121	29	6	2,675	3	138	296	3,146
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	14	124	218	22	1	3	1	0	0	0	381	91	19	8,467	9	437	937	9,959

(2) 5-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	5	42	74	8	0	1	0	0	0	0	131	31	7	2,889	3	149	320	3,398
2	0.25-0.5	5	42	74	8	0	1	0	0	0	0	131	31	7	2,896	3	150	321	3,407
3	0.5-1.0	8	73	128	13	1	2	1	0	0	0	227	54	11	4,992	5	258	553	5,871
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	1	1	9
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	18	158	277	29	1	4	2	1	0	0	489	116	24	10,784	11	557	1,194	12,681

(3) 10-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	3	30	53	6	0	1	0	0	0	0	94	22	5	2,068	2	107	229	2,432
2	0.25-0.5	5	42	74	8	0	1	0	0	0	0	131	31	7	2,896	3	150	321	3,407
3	0.5-1.0	10	85	149	15	1	2	1	0	0	0	263	62	13	5,792	6	299	641	6,813
4	1.0-1.5	1	12	21	2	0	0	0	0	0	0	38	9	2	828	1	43	92	974
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	20	169	297	31	1	4	2	1	0	0	525	124	26	11,583	12	598	1,282	13,625

(4) 20-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	1	12	21	2	0	0	0	0	0	0	36	9	2	801	1	42	89	942
2	0.25-0.5	5	42	74	8	0	1	0	0	0	0	131	31	7	2,884	3	149	319	3,393
3	0.5-1.0	10	85	149	15	1	2	1	0	0	0	263	62	13	5,792	6	299	641	6,813
4	1.0-1.5	4	31	54	6	0	1	0	0	0	0	95	23	5	2,107	2	109	233	2,477
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	20	169	297	31	1	4	2	1	0	0	525	124	26	11,583	12	598	1,282	13,624

(5) 50-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0.25-0.5	3	30	53	6	0	1	0	0	0	0	94	22	5	2,060	2	107	228	2,423
3	0.5-1.0	10	85	149	15	1	2	1	0	0	0	263	62	13	5,792	6	299	641	6,813
4	1.0-1.5	6	55	96	10	0	1	1	0	0	0	170	40	8	3,732	4	193	413	4,389
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	20	169	297	31	1	4	2	1	0	0	526	124	26	11,583	12	598	1,282	13,625

TABLA K.2.4(2) CANTIDAD Y AREA DE LOS BIENES INUNDADOS EN EL CHANE CHACRAS (CON PROYECTO)

(1) 2-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0.25-0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0.5-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(2) 5-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	4	31	53	5	0	1	0	0	0	0	95	22	5	2,085	2	108	231	2,453
2	0.25-0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0.5-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	4	31	53	5	0	1	0	0	0	0	95	22	5	2,085	2	108	231	2,453

(3) 10-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	10	85	149	15	1	2	1	0	0	0	263	62	13	5,793	6	299	641	6,814
2	0.25-0.5	2	14	24	2	0	0	0	0	0	0	42	10	2	927	1	48	103	1,091
3	0.5-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	11	98	173	18	1	2	1	0	0	0	305	72	15	6,720	7	347	741	7,905

(4) 20-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	10	85	149	15	1	2	1	0	0	0	263	62	13	5,793	6	299	641	6,814
2	0.25-0.5	9	78	137	14	1	2	1	0	0	0	242	57	12	5,329	5	275	590	6,268
3	0.5-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	19	163	286	29	1	4	2	1	0	1	505	119	25	11,122	11	574	1,231	13,082

(5) 50-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	10	85	149	15	1	2	1	0	0	0	263	62	13	5,791	6	299	641	6,812
2	0.25-0.5	10	85	149	15	1	2	1	0	0	0	263	62	13	5,791	6	299	641	6,812
3	0.5-1.0	5	44	77	8	0	1	1	0	0	0	137	32	7	3,011	3	155	333	3,541
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	25	213	374	39	2	5	2	1	0	1	662	156	33	14,593	15	753	1,615	17,165

TABLA K.2.5(1) CANTIDAD Y AREA DE LOS BIENES INUNDADOS EN EL OKINAWA DRENAJE (SIN PROYECTO)

(1) 2-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	9	29	34	4	0	1	0	1	0	0	76	2,295	468	0	215	147	316	3,441
2	0.25-0.5	9	29	34	4	0	1	0	1	0	0	76	2,295	468	0	215	147	316	3,441
3	0.5-1.0	3	10	11	1	0	0	0	0	0	0	25	771	157	0	72	50	106	1,156
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	21	67	78	8	0	1	0	1	0	0	178	5,361	1,093	0	502	344	738	8,038

(2) 5-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	9	28	33	4	0	1	0	1	0	0	75	2,268	462	0	213	146	313	3,402
2	0.25-0.5	9	28	33	4	0	1	0	1	0	0	75	2,268	462	0	213	146	313	3,402
3	0.5-1.0	9	27	32	4	0	1	0	1	0	0	74	2,200	419	0	206	141	303	3,299
4	1.0-1.5	1	4	4	1	0	0	0	0	0	0	10	305	62	0	28	20	42	457
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	29	87	102	9	0	2	0	2	0	0	233	7,041	1,435	0	660	453	971	10,560

(3) 10-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	9	28	33	4	0	1	0	1	0	0	75	2,257	460	0	211	145	311	3,384
2	0.25-0.5	9	28	33	4	0	1	0	1	0	0	75	2,257	460	0	211	145	311	3,384
3	0.5-1.0	13	38	45	5	1	1	0	1	0	1	103	3,065	625	0	287	197	422	4,596
4	1.0-1.5	2	6	7	1	0	0	0	0	0	0	16	488	99	0	45	31	67	730
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	33	100	118	13	1	2	0	2	0	1	269	8,067	1,644	0	754	518	1,111	12,094

(4) 20-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	9	28	33	4	0	1	0	1	0	0	75	2,251	459	0	211	145	310	3,376
2	0.25-0.5	9	28	33	4	0	1	0	1	0	0	75	2,251	459	0	211	145	310	3,376
3	0.5-1.0	15	46	54	6	1	1	0	1	0	1	124	3,696	754	0	346	237	509	5,542
4	1.0-1.5	2	6	7	1	0	0	0	0	0	0	15	473	97	0	44	30	65	709
5	1.5-2.0	1	2	3	0	0	0	0	0	0	0	6	170	35	0	16	11	23	255
	Total	36	110	130	14	1	2	0	2	0	1	295	8,841	1,804	0	828	568	1,217	13,258

(5) 50-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	9	27	32	4	0	1	0	1	0	0	72	2,167	442	0	203	139	299	3,250
2	0.25-0.5	9	27	32	4	0	1	0	1	0	0	72	2,167	442	0	203	139	299	3,250
3	0.5-1.0	18	54	63	7	1	1	1	1	0	1	146	4,334	884	0	405	278	597	6,498
4	1.0-1.5	3	10	11	1	0	0	0	0	0	0	25	771	157	0	72	49	106	1,155
5	1.5-2.0	1	5	6	1	0	0	0	0	0	0	13	369	75	0	34	24	51	553
	Total	40	122	143	16	1	3	1	2	0	1	328	9,808	2,000	0	917	629	1,352	14,706

TABLA K.2.5(2) CANTIDAD Y AREA DE LOS BIENES INUNDADOS EN EL OKINAWA DRENAJE (CON PROYECTO)

(1) 2-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Tot
1	0.0-0.25	3	9	11	1	0	0	0	0	0	0	24	707	141	0	66	45	97	1,05
2	0.25-0.5	1	5	6	1	0	0	0	0	0	0	13	387	79	0	36	25	53	58
3	0.5-1.0	1	2	2	0	0	0	0	0	0	0	5	155	32	0	14	10	21	23
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	5	16	18	2	0	0	0	0	0	0	41	1,249	255	0	116	80	171	1,87

(2) 5-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Tot
1	0.0-0.25	8	27	32	4	0	1	0	1	0	0	71	2,142	437	0	200	138	295	3,21
2	0.25-0.5	1	4	4	1	0	0	0	0	0	0	10	286	58	0	27	18	39	42
3	0.5-1.0	2	6	8	1	0	0	0	0	0	0	17	504	103	0	47	32	69	75
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	12	36	43	5	0	1	0	1	0	0	98	2,932	598	0	274	188	403	4,39

(3) 10-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Tota
1	0.0-0.25	9	28	34	4	0	1	0	1	0	0	76	2,278	465	0	213	146	314	3,41
2	0.25-0.5	5	14	17	2	0	0	0	0	0	0	38	1,151	235	0	108	74	159	1,72
3	0.5-1.0	2	6	8	1	0	0	0	0	0	0	17	530	108	0	50	34	73	79.
4	1.0-1.5	1	1	2	0	0	0	0	0	0	0	4	138	28	0	13	9	19	20
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(
	Total	17	50	60	6	0	1	0	1	0	0	134	4,097	836	0	384	263	565	6,14

(4) 20-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	9	28	33	4	0	1	0	1	0	0	75	2,267	462	0	213	146	312	3,400
2	0.25-0.5	8	25	29	4	0	1	0	1	0	0	66	1,945	396	0	182	125	268	2,916
3	0.5-1.0	2	6	8	1	0	0	0	0	0	0	17	506	103	0	47	32	70	758
4	1.0-1.5	1	4	5	1	0	0	0	0	0	0	11	314	64	0	30	20	43	471
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	20	63	74	8	0	1	0	1	0	0	169	5,032	1,025	0	472	323	693	7,515

(5) 50-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Total
1	0.0-0.25	9	28	33	4	0	1	0	1	0	0	75	2,257	460	0	211	145	311	3,381
2	0.25-0.5	9	28	33	4	0	1	0	1	0	0	75	2,257	460	0	211	145	311	3,384
3	0.5-1.0	4	12	14	1	0	0	0	0	0	0	32	969	198	0	91	62	134	1,454
4	1.0-1.5	2	6	7	1	0	0	0	0	0	0	16	485	99	0	45	31	67	727
5	1.5-2.0	0	1	1	0	0	0	0	0	0	0	1	29	6	0	3	2	4	4
	Total	25	75	88	9	0	1	0	1	0	0	199	5,997	1,223	0	561	385	827	8,992

TABLA K.2.6(1) CANTIDAD Y AREA DE LOS BIENES INUNDADOS EN EL SAN JUAN (SIN PROYECTO)

(1) 2-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Nutural	Pasture Improved	Total
1	0.0-0.25	2	55	53	4	0	1	0	1	0	0	116	302	1,947	7	4	151	767	3,178
2	0.25-0.5	1	17	16	1	0	0	0	0	0	0	35	94	604	2	1	47	238	986
3	0.5-1.0	0	4	4	0	0	0	0	0	0	0	8	22	145	1	0	11	57	236
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	3	76	73	5	0	1	0	1	0	0	159	418	2,696	10	5	209	1,062	4,400

(2) 5-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Nutural	Pasture Improved	Total
1	0.0-0.25	2	59	57	5	0	1	0	1	0	0	125	328	2,116	8	5	164	833	3,454
2	0.25-0.5	2	52	50	4	0	1	0	1	0	0	110	284	1,836	7	4	142	723	2,996
3	0.5-1.0	1	13	13	1	0	0	0	0	0	0	28	73	468	2	1	36	184	764
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	5	124	120	10	0	2	0	2	0	0	263	685	4,420	17	10	342	1,740	7,214

(3) 10-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Nutural	Pasture Improved	Total
1	0.0-0.25	2	59	57	5	0	1	0	1	0	0	125	327	2,113	8	5	163	832	3,448
2	0.25-0.5	2	58	55	5	0	1	0	1	0	0	122	318	2,052	8	5	159	808	3,350
3	0.5-1.0	1	31	30	3	0	0	0	0	0	0	65	171	1,104	4	2	85	435	1,801
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	5	148	142	13	0	2	0	2	0	0	312	816	5,269	20	12	407	2,075	8,599

(4) 20-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Nutural	Pasture Improved	Total
1	0.0-0.25	2	59	57	5	0	1	0	1	0	0	125	327	2,111	8	5	163	831	3,445
2	0.25-0.5	2	59	57	5	0	1	0	1	0	0	125	327	2,111	8	5	163	831	3,445
3	0.5-1.0	2	47	45	4	0	0	0	1	0	0	99	258	1,667	6	4	129	657	2,721
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	6	165	159	14	0	2	0	3	0	0	349	912	5,889	22	14	455	2,319	9,611

(5) 50-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Nutural	Pasture Improved	Total
1	0.0-0.25	2	59	57	5	0	1	0	1	0	0	125	327	2,111	8	5	163	831	3,445
2	0.25-0.5	2	59	57	5	0	1	0	1	0	0	125	327	2,111	8	5	163	831	3,445
3	0.5-1.0	3	70	67	6	0	1	0	1	0	0	148	384	2,476	9	5	192	975	4,041
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	7	188	181	16	0	3	0	3	0	0	398	1,038	6,698	25	15	518	2,637	10,931

TABLA K.2.6(2) CANTIDAD Y AREA DE LOS BIENES INUNDADOS EN EL SAN JUAN (CON PROYECTO)

(1) 2-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Tot
1	0.0-0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	0.25-0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	0.5-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

(2) 5-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Tot
1	0.0-0.25	1	25	24	2	0	0	0	0	0	0	52	139	897	3	2	69	353	1,4
2	0.25-0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	0.5-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	1	25	24	2	0	0	0	0	0	0	52	139	897	3	2	69	353	1,3

(3) 10-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Tot
1	0.0-0.25	2	49	48	4	0	0	0	1	0	0	104	273	1,762	7	4	136	694	2,87
2	0.25-0.5	0	1	1	0	0	0	0	0	0	0	2	6	37	0	0	3	15	6
3	0.5-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	2	50	49	4	0	0	0	1	0	0	106	279	1,799	7	4	139	709	2,93

(4) 20-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Tot
1	0.0-0.25	2	59	57	5	0	1	0	1	0	0	125	328	2,115	8	5	164	833	3,45
2	0.25-0.5	1	15	15	1	0	0	0	0	0	0	32	84	541	2	1	42	213	88
3	0.5-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	3	74	72	6	0	1	0	1	0	0	157	412	2,656	10	6	206	1,046	4,33

(5) 50-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Tot
1	0.0-0.25	2	59	57	5	0	1	0	1	0	0	125	327	2,114	8	5	164	832	3,45
2	0.25-0.5	2	38	37	3	0	0	0	1	0	0	81	210	1,356	5	3	105	534	2,21
3	0.5-1.0	0	5	5	0	0	0	0	0	0	0	10	29	190	1	0	15	75	31
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	4	102	99	8	0	1	0	2	0	0	216	566	3,660	14	8	284	1,441	5,97

TABLA K.2.7(1) CANTIDAD Y AREA DE LOS BIENES INUNDADOS EN EL ANTOFAGASTA (SIN PROYECTO)

(1) 2-Year Return Period

No.	Water Depth (m)	Buildings: Residence			Shop	Restau-rant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soy-beans	Rice	Sugar cane	Maize	Pasture: Natural	Pasture: Improved	Total
		High	Medium	Low															
1	0.0-0.25	4	88	84	7	0	1	0	1	0	0	185	611	3,946	0	9	112	572	5,250
2	0.25-0.5	3	64	62	5	0	1	0	1	0	0	136	448	2,894	0	7	82	419	3,850
3	0.5-1.0	0	8	8	1	0	0	0	0	0	0	17	55	358	0	1	10	52	476
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	7	160	154	13	0	2	0	2	0	0	338	1,114	7,198	0	17	204	1,043	9,576

(2) 5-Year Return Period

No.	Water Depth (m)	Buildings: Residence			Shop	Restau-rant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soy-beans	Rice	Sugar cane	Maize	Pasture: Natural	Pasture: Improved	Total
		High	Medium	Low															
1	0.0-0.25	4	96	92	8	0	1	0	1	0	0	202	671	4,333	0	10	123	628	5,765
2	0.25-0.5	3	72	70	6	0	1	0	1	0	0	153	506	3,265	0	7	93	473	4,341
3	0.5-1.0	1	31	30	3	0	0	0	0	0	0	65	219	1,411	0	3	40	204	1,877
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	8	199	192	17	0	2	0	2	0	0	420	1,396	9,009	0	20	256	1,305	11,986

(3) 10-Year Return Period

No.	Water Depth (m)	Buildings: Residence			Shop	Restau-rant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soy-beans	Rice	Sugar cane	Maize	Pasture: Natural	Pasture: Improved	Total
		High	Medium	Low															
1	0.0-0.25	4	96	92	8	0	1	0	1	0	0	202	670	4,328	0	10	123	627	5,758
2	0.25-0.5	3	79	76	6	0	1	0	1	0	0	166	551	3,559	0	8	101	516	4,735
3	0.5-1.0	2	50	48	4	0	1	0	1	0	0	106	352	2,274	0	5	65	329	3,025
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	9	225	216	18	0	3	0	3	0	0	474	1,573	10,161	0	23	289	1,472	13,518

(4) 20-Year Return Period

No.	Water Depth (m)	Buildings: Residence			Shop	Restau-rant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soy-beans	Rice	Sugar cane	Maize	Pasture: Natural	Pasture: Improved	Total
		High	Medium	Low															
1	0.0-0.25	4	96	92	8	0	1	0	1	0	0	202	671	4,330	0	10	123	627	5,761
2	0.25-0.5	3	84	80	7	0	1	0	1	0	0	176	585	3,775	0	9	107	547	5,023
3	0.5-1.0	3	66	64	5	0	1	0	1	0	0	140	464	2,995	0	7	85	434	3,985
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	10	246	236	20	0	3	0	3	0	0	518	1,720	11,100	0	26	315	1,608	14,769

(5) 50-Year Return Period

No.	Water Depth (m)	Buildings: Residence			Shop	Restau-rant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soy-beans	Rice	Sugar cane	Maize	Pasture: Natural	Pasture: Improved	Total
		High	Medium	Low															
1	0.0-0.25	4	96	92	8	0	1	0	1	0	0	202	671	4,330	0	10	123	627	5,761
2	0.25-0.5	4	88	84	7	0	1	0	1	0	0	185	611	3,945	0	9	112	572	5,249
3	0.5-1.0	4	88	84	7	0	1	0	1	0	0	185	614	3,961	0	9	113	574	5,271
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	12	272	260	22	0	3	0	3	0	0	572	1,896	12,236	0	28	348	1,773	16,281

TABLA K.2.7(2) CANTIDAD Y AREA DE LOS BIENES INUNDADOS EN EL ANTOFAGASTA (CON PROYECTO)

(1) 2-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	To
1	0.0-0.25	1	23	22	2	0	0	0	0	0	0	48	159	1,024	0	2	29	148	1,3
2	0.25-0.5	0	10	10	1	0	0	0	0	0	0	21	72	466	0	1	13	68	6
3	0.5-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	1	33	32	3	0	0	0	0	0	0	69	231	1,490	0	3	42	216	1,9

(2) 5-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	To
1	0.0-0.25	1	29	27	2	0	0	0	0	0	0	59	199	1,286	0	3	37	186	1,7
2	0.25-0.5	1	22	21	2	0	0	0	0	0	0	46	153	987	0	2	28	143	1,3
3	0.5-1.0	0	1	1	0	0	0	0	0	0	0	2	9	55	0	0	2	8	
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	2	52	49	4	0	0	0	0	0	0	107	361	2,328	0	5	67	337	3,0

(3) 10-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	To
1	0.0-0.25	1	34	33	3	0	0	0	0	0	0	71	238	1,538	0	3	44	223	2,0
2	0.25-0.5	1	23	22	2	0	0	0	0	0	0	48	159	1,026	0	2	29	149	1,3
3	0.5-1.0	0	8	8	1	0	0	0	0	0	0	17	55	355	0	1	10	51	4
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	2	65	63	6	0	0	0	0	0	0	136	452	2,919	0	6	83	423	3,8

(4) 20-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Tot
1	0.0-0.25	2	41	39	3	0	0	0	1	0	0	86	285	1,842	0	4	52	267	2,4
2	0.25-0.5	1	23	22	2	0	0	0	0	0	0	48	159	1,027	0	2	29	149	1,3
3	0.5-1.0	1	14	13	1	0	0	0	0	0	0	29	97	628	0	1	18	91	8
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	4	78	74	6	0	0	0	1	0	0	163	541	3,497	0	7	99	507	4,6

(5) 50-Year Return Period

No.	Water Depth (m)	Buildings: Residence High	Residence Medium	Residence Low	Shop	Restaurant	School	Church	Factory	Hospital	Health Center	Total	Agricultural Crops (ha): Soybeans	Rice	Sugar cane	Maize	Pasture Natural	Pasture Improved	Tot
1	0.0-0.25	2	51	49	4	0	1	0	1	0	0	108	354	2,285	0	5	65	331	3,01
2	0.25-0.5	1	23	22	2	0	0	0	0	0	0	48	159	1,026	0	2	29	149	1,36
3	0.5-1.0	1	21	21	2	0	0	0	0	0	0	45	150	969	0	2	28	140	1,28
4	1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	4	95	92	8	0	1	0	1	0	0	201	663	4,280	0	9	122	620	5,69

TABLA K.2.8 VALORIZACION PROMEDIO DE LOS BIENES EN EL AREA SUJETA A INUNDACIONES (AL FINALIZAR EL OCTUBRE DE 1995)

1. Buildings and Household Effects

Unit : Bs.

No.	Kind of Assets	Buildings	House-hold Effects*	livestock
1	Residence			
	(A) High Class	579,600	1,426,190	55,750
	(B) Medium Class	115,250	333,860	6,040
	(C) Low Class	7,090	39,040	560
2	Shop**	19,600	86,860	-
3	Restaurant	23,000	17,080	-
4	School	78,920	13,380	-
5	Church	170,500	29,590	-
6	Factory	119,700	369,930	-
7	Hospital	1,094,000	6,873,990	-
8	Health Center	23,400	6,940	-

2. Agricultural Crops and Cattle

No.	Crops	Production (Tons/ha)	Unit Price (Bs/ton)	Unit Price (Bs/ha)
1	Soybeans (summer)	2.00	777.60	1,555
2	Rice (mechanical)	3.36	687.72	2,309
3	Sugar cane (mechanical)	45.72	92.34	4,222
4	Maize	4.60	388.80	1,788
		(Head/ha)	(Bs/head)	(Bs/ha)
5	Cattle***	1.00	1,215.00	1,215
	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-

Source : Interview survey by the JICA Study Team

Note : * Household effects include equipment and materials.

** Household effects of shop include commodities for sale together with equipment and materials.

*** Price of cattle is used in estimating the flood damage of pasture.

TABLA K.2.9 TASA DE DAÑOS POR INUNDACIONES SOBRE LOS BIENES

No.	Inundation Depth (cm.)	Damage Rate							
		General Assets		Livestock	Agricultural Field Crops and Cattle				
		Buildings	Household Effects		Soybeans	Rice	Sugar cane	Maize	Cattle*
1	0 - 25	0.140	0.111	0.113	0.100	0.106	0.095	0.122	0.560
2	25 - 50	0.198	0.127	0.121	0.299	0.319	0.284	0.366	0.560
3	50 - 100	0.355	0.254	0.373	0.896	0.954	0.851	1.000	0.560
4	100 - 150	0.452	0.325	0.379	0.949	1.000	0.945	1.000	0.560
5	150 - 200	0.453	0.343	-	1.000	1.000	1.000	1.000	0.560

Source : Results of interview survey by the JICA Study Team
Note : *Damage rate of cattle is used for innundation of the pasture field.

TABLA K.2.10 DAÑOS POR INUNDACIONES SEGUN EL PERIODO DE RETORNO (RIO CHANE)

I. RIO CHANE

(1) Without-Project

No.	Return Period (Year)	Flood Damage (Bs. 1,000)						
		Building	Household Effects	Livestock	Agricultural Crops	Public Facilities	Business Activities	Total
1	2	4,114	8,222	239	4,574	4,194	740	22,083
2	5	6,126	12,259	371	7,220	6,251	1,103	33,330
3	10	7,087	14,162	412	8,852	7,225	1,275	39,013

(2) With-Project (10-Year Flood Mitigation)

No.	Return Period (Year)	Flood Damage (Bs. 1,000)						
		Building	Household Effects	Livestock	Agricultural Crops	Public Facilities	Business Activities	Total
1	2	3,329	6,721	189	3,498	3,417	603	17,757
2	5	6,109	12,240	362	6,887	6,239	1,101	32,938
3	10	7,127	14,329	412	8,876	7,295	1,287	39,326

(3) Reduction in Damage (Difference of Without- and With-Projects)

No.	Return Period (Year)	Flood Damage (Bs. 1,000)						
		Building	Household Effects	Livestock	Agricultural Crops	Public Facilities	Business Activities	Total
1	2	785	1,501	50	1,076	777	137	4,326
2	5	17	19	9	333	12	2	392
3	10	-40	-167	0	-24	-70	-12	-313

TABLA K.2.11 DAÑOS POR INUNDACIONES SEGUN EL PERIODO DE RETORNO (RIO PAILON)

II. RIO PAILON

(1) Without-Project

No.	Return Period (Year)	Flood Damage (Bs. 1,000)						
		Building	Household Effects	Livestock	Agricultural Crops	Public Facilities	Business Activities	Total
1	2	9,497	18,242	683	11,542	9,431	1,664	51,059
2	5	13,033	24,931	921	17,050	12,908	2,278	71,121
3	10	15,398	29,740	1,099	20,542	15,347	2,708	84,834

(2) With-Project (10-Year Flood Mitigation)

No.	Return Period (Year)	Flood Damage (Bs. 1,000)						
		Building	Household Effects	Livestock	Agricultural Crops	Public Facilities	Business Activities	Total
1	2	364	782	23	154	390	69	1,782
2	5	1,184	2,480	72	571	1,246	220	5,773
3	10	2,329	4,826	140	1,220	2,433	429	11,377

(3) Reduction in Damage (Difference of Without- and With-Projects)

No.	Return Period (Year)	Flood Damage (Bs. 1,000)						
		Building	Household Effects	Livestock	Agricultural Crops	Public Facilities	Business Activities	Total
1	2	9,133	17,460	660	11,388	9,041	1,595	49,277
2	5	11,849	22,451	849	16,479	11,662	2,058	65,348
3	10	13,069	24,914	959	19,322	12,914	2,279	73,457

TABLA K.2.12 DAÑOS POR INUNDACIONES SEGUN EL PERIODO DE RETORNO (QUEBRADA CHANE)

III. QUEBRADA CHANE

(1) Without-Project

No.	Return Period (Year)	Flood Damage (Bs. 1,000)						
		Building	Household Effects	Livestock	Agricultural Crops	Public Facilities	Business Activities	Total
1	2	3,504	7,334	212	5,655	3,685	650	21,040
2	5	5,439	11,403	341	9,468	5,726	1,011	33,388
3	10	7,174	14,964	462	12,872	7,527	1,328	44,327

(2) With-Project (10-Year Flood Mitigation)

No.	Return Period (Year)	Flood Damage (Bs. 1,000)						
		Building	Household Effects	Livestock	Agricultural Crops	Public Facilities	Business Activities	Total
1	2	613	1,408	36	423	687	121	3,288
2	5	1,321	2,913	73	1,111	1,440	254	7,112
3	10	2,356	4,822	119	2,219	2,406	425	12,347

(3) Reduction in Damage (Difference of Without- and With-Projects)

No.	Return Period (Year)	Flood Damage (Bs. 1,000)						
		Building	Household Effects	Livestock	Agricultural Crops	Public Facilities	Business Activities	Total
1	2	2,891	5,926	176	5,232	2,998	529	17,752
2	5	4,118	8,490	268	8,357	4,286	757	26,276
3	10	4,818	10,142	343	10,653	5,121	903	31,980

TABLA K.2.13 DAÑOS POR INUNDACIONES SEGUN EL PERIODO DE RETORNO (CHANE CHACRAS)

IV. CHANE CHACRAS

(1) Without-Project

No.	Return Period (Year)	Flood Damage (Bs. 1,000)						
		Building	Household Effects	Livestock	Agricultural Crops	Public Facilities	Business Activities	Total
1	2	5,722	11,721	330	14,329	5,931	1,047	39,080
2	5	8,219	17,037	500	22,730	8,587	1,515	58,588
3	10	9,801	20,238	600	28,585	10,213	1,802	71,239

(2) With-Project (10-Year Flood Mitigation)

No.	Return Period (Year)	Flood Damage (Bs. 1,000)						
		Building	Household Effects	Livestock	Agricultural Crops	Public Facilities	Business Activities	Total
1	2	0	0	0	0	0	0	0
2	5	873	2,002	47	841	978	173	4,914
3	10	2,948	6,504	151	3,456	3,214	567	16,840

(3) Reduction in Damage (Difference of Without- and With-Projects)

No.	Return Period (Year)	Flood Damage (Bs. 1,000)						
		Building	Household Effects	Livestock	Agricultural Crops	Public Facilities	Business Activities	Total
1	2	5,722	11,721	330	14,329	5,931	1,047	39,080
2	5	7,346	15,035	453	21,889	7,609	1,342	53,674
3	10	6,853	13,734	449	25,129	6,999	1,235	54,399

TABLA K.2.14 DAÑOS POR INUNDACIONES SEGUN EL PERIODO DE RETORNO (OKINAWA DRENAJE)

V. OKINAWA DRAINAGE

(1) Without-Project

No.	Return Period (Year)	Flood Damage (Bs. 1,000)						
		Building	Household Effects	Livestock	Agricultural Crops	Public Facilities	Business Activities	Total
1	2	4,066	7,805	246	3,615	4,036	712	20,480
2	5	6,735	12,934	459	7,106	6,687	1,180	35,101

(2) With-Project (10-Year Flood Mitigation)

No.	Return Period (Year)	Flood Damage (Bs. 1,000)						
		Building	Household Effects	Livestock	Agricultural Crops	Public Facilities	Business Activities	Total
1	2	907	1,789	58	732	916	162	4,564
2	5	2,134	4,333	145	1,688	2,199	388	10,887

(3) Reduction in Damage (Difference of Without- and With-Projects)

No.	Return Period (Year)	Flood Damage (Bs. 1,000)						
		Building	Household Effects	Livestock	Agricultural Crops	Public Facilities	Business Activities	Total
1	2	3,159	6,016	188	2,883	3,120	550	15,916
2	5	4,601	8,601	314	5,418	4,488	792	24,214

TABLA K.2.15 DAÑOS POR INUNDACIONES SEGUN EL PERIODO DE RETORNO (SAN JUAN)

VI. SAN JUAN

(1) Without-Project

No.	Return Period (Year)	Flood Damage (Bs. 1,000)						
		Building	Household Effects	Livestock	Agricultural Crops	Public Facilities	Business Activities	Total
1	2	1,844	4,037	84	1,371	1,999	353	9,688
2	5	3,531	7,364	164	3,207	3,704	654	18,624
3	10	4,472	9,394	213	4,928	4,714	832	24,553

(2) With-Project (10-Year Flood Mitigation)

No.	Return Period (Year)	Flood Damage (Bs. 1,000)						
		Building	Household Effects	Livestock	Agricultural Crops	Public Facilities	Business Activities	Total
1	2	0	0	0	0	0	0	0
2	5	514	1,208	25	243	585	103	2,678
3	10	1,053	2,467	50	507	1,197	211	5,485

(3) Reduction in Damage (Difference of Without- and With-Projects)

No.	Return Period (Year)	Flood Damage (Bs. 1,000)						
		Building	Household Effects	Livestock	Agricultural Crops	Public Facilities	Business Activities	Total
1	2	1,844	4,037	84	1,371	1,999	353	9,683
2	5	3,017	6,156	139	2,964	3,119	551	15,946
3	10	3,419	6,927	163	4,421	3,517	621	19,068

TABLA K.2.16 DAÑOS POR INUNDACIONES SEGUN EL PERIODO DE RETORNO (ANTOFAGASTA)

VII. Antofagasta

(1) Without-Project

No.	Return Period (Year)	Flood Damage (Bs. 1,000)						
		Building	Household Effects	Livestock	Agricultural Crops	Public Facilities	Business Activities	Total
1	2	4,180	8,816	181	4,270	4,419	780	22,646
2	5	5,733	12,122	271	7,224	6,071	1,071	32,492
3	10	7,007	14,720	344	9,549	7,387	1,304	40,311

(2) With-Project (10-Year Flood Mitigation)

No.	Return Period (Year)	Flood Damage (Bs. 1,000)						
		Building	Household Effects	Livestock	Agricultural Crops	Public Facilities	Business Activities	Total
1	2	726	1,610	31	652	794	140	3,953
2	5	1,279	2,704	55	1,278	1,354	239	6,909
3	10	1,703	3,657	76	2,104	1,823	322	9,685

(3) Reduction in Damage (Difference of Without- and With-Projects)

No.	Return Period (Year)	Flood Damage (Bs. 1,000)						
		Building	Household Effects	Livestock	Agricultural Crops	Public Facilities	Business Activities	Total
1	2	3,454	7,206	150	3,618	3,625	640	18,693
2	5	4,454	9,418	216	5,946	4,717	832	25,583
3	10	5,304	11,063	268	7,445	5,564	982	30,626

TABLA K.3.1(1) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO DEL RIO CHANE (ALTERNATIVE-1)

(1)FinancialCost

1

Unit : Bs. 1,000

No.	Classification of Costs	2000 L.C.	F.C.	Total
1	Construction Cost	0	0	0
2	Land Acquisition	64	0	64
3	Administration	3	0	3
4	Engineering Services	321	1,136	1,457
5	Physical Contingency	58	170	229
	Sub-total	446	1,306	1,753
6	price Escalation	180	283	463
	Grand Total	626	1,589	2,216 O/M Cost 0

2

No.	Classification of Costs	2001 L.C.	F.C.	Total
1	Construction Cost	12,422	14,310	26,732
2	Land Acquisition	65	0	65
3	Administration	1,340	0	1,340
4	Engineering Services	535	1,893	2,428
5	Physical Contingency	2,154	2,430	4,585
	Sub-total	16,516	18,633	35,150
6	price Escalation	8,270	4,944	13,214
	Grand Total	24,786	23,577	48,364 O/M Cost 0

3

No.	Classification of Costs	2002 L.C.	F.C.	Total
1	Construction Cost	12,422	14,310	26,732
2	Land Acquisition	65	0	65
3	Administration	1,340	0	1,340
4	Engineering Services	535	1,893	2,428
5	Physical Contingency	2,154	2,430	4,585
	Sub-total	16,516	18,633	35,150
6	price Escalation	10,005	5,887	15,892
	Grand Total	26,521	24,520	51,042 O/M Cost 429

4

No.	Classification of Costs	2003 L.C.	F.C.	Total
1	Construction Cost	12,422	14,310	26,732
2	Land Acquisition	65	0	65
3	Administration	1,340	0	1,340
4	Engineering Services	535	1,893	2,428
5	Physical Contingency	2,154	2,430	4,585
	Sub-total	16,516	18,633	35,150
6	price Escalation	11,861	6,868	18,729
	Grand Total	28,377	25,501	53,879 O/M Cost 918

5

No.	Classification of Costs	2004 L.C.	F.C.	Total
1	Construction Cost	12,422	14,310	26,732
2	Land Acquisition	65	0	65
3	Administration	1,340	0	1,340
4	Engineering Services	535	1,893	2,428
5	Physical Contingency	2,154	2,430	4,585
	Sub-total	16,516	18,633	35,150
6	price Escalation	13,848	7,888	21,736
	Grand Total	30,364	26,521	56,886 O/M Cost 1,474

(2)EconomicCost

1

Unit : Bs. 1,000

No.	Classification of Costs	2000 L.C.	F.C.	Total
1	Construction Cost	0	0	0
2	Land Acquisition	35	0	35
3	Administration	3	0	3
4	Engineering Services	284	1,136	1,420
5	Physical Contingency	48	170	219
	Sub-total	370	1,306	1,677
6	price Escalation	0	0	0
	Grand Total	370	1,306	1,677 O/M Cost 0

2

No.	Classification of Costs	2001 L.C.	F.C.	Total
1	Construction Cost	8,820	12,664	21,483
2	Land Acquisition	36	0	36
3	Administration	1,186	0	1,186
4	Engineering Services	473	1,893	2,366
5	Physical Contingency	1,577	2,184	3,761
	Sub-total	12,092	16,740	28,832
6	price Escalation	0	0	0
	Grand Total	12,092	16,740	28,832 O/M Cost 0

3

No.	Classification of Costs	2002 L.C.	F.C.	Total
1	Construction Cost	8,820	12,664	21,483
2	Land Acquisition	36	0	36
3	Administration	1,186	0	1,186
4	Engineering Services	473	1,893	2,366
5	Physical Contingency	1,577	2,184	3,761
	Sub-total	12,092	16,740	28,832
6	price Escalation	0	0	0
	Grand Total	12,092	16,740	28,832 O/M Cost 215

4

No.	Classification of Costs	2003 L.C.	F.C.	Total
1	Construction Cost	8,820	12,664	21,483
2	Land Acquisition	36	0	36
3	Administration	1,186	0	1,186
4	Engineering Services	473	1,893	2,366
5	Physical Contingency	1,577	2,184	3,761
	Sub-total	12,092	16,740	28,832
6	price Escalation	0	0	0
	Grand Total	12,092	16,740	28,832 O/M Cost 430

5

No.	Classification of Costs	2004 L.C.	F.C.	Total
1	Construction Cost	8,820	12,664	21,483
2	Land Acquisition	36	0	36
3	Administration	1,186	0	1,186
4	Engineering Services	473	1,893	2,366
5	Physical Contingency	1,577	2,184	3,761
	Sub-total	12,092	16,740	28,832
6	price Escalation	0	0	0
	Grand Total	12,092	16,740	28,832 O/M Cost 645

TABLA K.3.1(2) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO DEL RIO CHANE (ALTERNATIVE-1&-2)

(1) Financial Cost

6

No.	Classification of Costs	2005 L.C.	2005 F.C.	2005 Total
1	Construction Cost	12,423	14,309	26,732
2	Land Acquisition	0	0	0
3	Administration	1,337	0	1,337
4	Engineering Services	214	757	971
5	Physical Contingency	2,096	2,260	4,356
	Sub-total	16,070	17,326	33,396
6	price Escalation	15,542	8,320	23,862
	Grand Total	31,612	25,646	57,258

OM Cost 2,103

Total

	Classification of Costs	Total L.C.	Total F.C.	Total Total
1	Construction Cost	62,111	71,549	133,660
2	Administration	324	0	324
3	Engineering Services	6,700	0	6,700
4	Land Acquisition	2,675	9,465	12,140
6	Physical Contingency	10,772	12,152	22,924
	Sub-total	82,582	93,166	175,748
7	price Escalation	59,706	34,190	93,896
	Grand Total	142,288	127,356	269,644

OM Cost 2,813

(2) Economic Cost

6

No.	Classification of Costs	2005 L.C.	2005 F.C.	2005 Total
1	Construction Cost	8,820	12,663	21,483
2	Land Acquisition	0	0	0
3	Administration	1,183	0	1,183
4	Engineering Services	189	757	946
5	Physical Contingency	1,529	2,013	3,542
	Sub-total	11,722	15,433	27,155
6	price Escalation	0	0	0
	Grand Total	11,722	15,433	27,155

OM Cost 859

Total

	Classification of Costs	Total L.C.	Total F.C.	Total Total
1	Construction Cost	44,099	63,318	107,417
2	Administration	178	0	178
3	Engineering Services	5,929	0	5,929
4	Land Acquisition	2,367	9,465	11,842
6	Physical Contingency	7,886	10,917	18,803
	Sub-total	60,459	83,700	144,160
7	price Escalation	0	0	0
	Grand Total	60,459	83,700	144,160

OM Cost 1,074

TABLA K.3.2(1) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO DEL RIO PAILON (ALTERNATIVE-1&-2)

(1) Financial Cost

1

Unit : Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total	
1	Construction Cost	0	0	0	
2	Land Acquisition	86	0	86	
3	Administration	4	0	4	
4	Engineering Services	479	1,695	2,174	
5	Physical Contingency	85	254	340	
	Sub-total	654	1,949	2,604	
6	price Escalation	263	422	685	
	Grand Total	917	2,371	3,289	OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total	
1	Construction Cost	19,786	20,100	39,886	
2	Land Acquisition	86	0	86	
3	Administration	1,999	0	1,999	
4	Engineering Services	798	2,824	3,622	
5	Physical Contingency	3,400	3,439	6,839	
	Sub-total	26,069	26,363	52,432	
6	price Escalation	13,053	6,994	20,047	
	Grand Total	39,122	33,357	72,479	OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total	
1	Construction Cost	19,786	20,100	39,886	
2	Land Acquisition	87	0	87	
3	Administration	1,999	0	1,999	
4	Engineering Services	798	2,824	3,622	
5	Physical Contingency	3,401	3,439	6,839	
	Sub-total	26,071	26,363	52,433	
6	price Escalation	15,793	8,329	24,122	
	Grand Total	41,864	34,692	76,555	OM Cost 640

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total	
1	Construction Cost	19,786	20,100	39,886	
2	Land Acquisition	166	0	166	
3	Administration	2,003	0	2,003	
4	Engineering Services	918	3,250	4,168	
5	Physical Contingency	3,431	3,503	6,933	
	Sub-total	26,304	26,853	53,156	
6	price Escalation	18,891	9,897	28,788	
	Grand Total	45,195	36,750	81,944	OM Cost 1,371

5

No.	Classification of Costs	2004 L.C.	2004 F.C.	2004 Total	
1	Construction Cost	24,760	25,152	49,912	
2	Land Acquisition	110	0	110	
3	Administration	2,501	0	2,501	
4	Engineering Services	1,015	3,592	4,607	
5	Physical Contingency	4,258	4,312	8,570	
	Sub-total	32,644	33,056	65,700	
6	price Escalation	27,370	13,993	41,363	
	Grand Total	60,014	47,049	107,063	OM Cost 2,200

(2) Economic Cost

1

Unit : Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total	
1	Construction Cost	0	0	0	
2	Land Acquisition	47	0	47	
3	Administration	4	0	4	
4	Engineering Services	424	1,695	2,119	
5	Physical Contingency	71	254	325	
	Sub-total	546	1,949	2,495	
6	price Escalation	0	0	0	
	Grand Total	546	1,949	2,495	OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total	
1	Construction Cost	14,048	17,788	31,836	
2	Land Acquisition	47	0	47	
3	Administration	1,769	0	1,769	
4	Engineering Services	706	2,824	3,530	
5	Physical Contingency	2,486	3,092	5,577	
	Sub-total	19,056	23,703	42,760	
6	price Escalation	0	0	0	
	Grand Total	19,056	23,703	42,760	OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total	
1	Construction Cost	14,048	17,788	31,836	
2	Land Acquisition	48	0	48	
3	Administration	1,769	0	1,769	
4	Engineering Services	706	2,824	3,530	
5	Physical Contingency	2,486	3,092	5,577	
	Sub-total	19,057	23,703	42,760	
6	price Escalation	0	0	0	
	Grand Total	19,057	23,703	42,760	OM Cost 318

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total	
1	Construction Cost	14,048	17,788	31,836	
2	Land Acquisition	91	0	91	
3	Administration	1,773	0	1,773	
4	Engineering Services	812	3,250	4,062	
5	Physical Contingency	2,509	3,156	5,664	
	Sub-total	19,233	24,193	43,426	
6	price Escalation	0	0	0	
	Grand Total	19,233	24,193	43,426	OM Cost 637

5

No.	Classification of Costs	2004 L.C.	2004 F.C.	2004 Total	
1	Construction Cost	17,580	22,258	39,838	
2	Land Acquisition	61	0	61	
3	Administration	2,213	0	2,213	
4	Engineering Services	898	3,592	4,490	
5	Physical Contingency	3,113	3,878	6,990	
	Sub-total	23,864	29,728	53,592	
6	price Escalation	0	0	0	
	Grand Total	23,864	29,728	53,592	OM Cost 955

TABLA K.3.2(2) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO DEL RIO PAILON (ALTERNATIVE-1&-2)

(1) Financial Cost

6

No.	Classification of Costs	2005 L.C.	2005 F.C.	2005 Total
1	Construction Cost	25,437	25,840	51,277
2	Land Acquisition	0	0	0
3	Administration	2,564	0	2,564
4	Engineering Services	410	1,451	1,861
5	Physical Contingency	4,262	4,094	8,355
	Sub-total	32,673	31,385	64,057
6	price Escalation	31,599	15,072	46,671
	Grand Total	64,272	46,457	110,728

OM Cost 3,336

Total

	Classification of Costs	Total L.C.	Total F.C.	Total
1	Construction Cost	109,555	111,292	220,847
2	Administration	535	0	535
3	Engineering Services	11,070	0	11,070
4	Land Acquisition	4,418	15,636	20,054
6	Physical Contingency	18,837	19,039	37,876
	Sub-total	144,415	145,967	290,382
7	price Escalation	106,969	54,707	161,676
	Grand Total	251,384	200,674	452,058

OM Cost 4,649

(2) Economic Cost

6

No.	Classification of Costs	2005 L.C.	2005 F.C.	2005 Total
1	Construction Cost	18,060	22,867	40,928
2	Land Acquisition	0	0	0
3	Administration	2,269	0	2,269
4	Engineering Services	363	1,451	1,814
5	Physical Contingency	3,104	3,648	6,752
	Sub-total	23,796	27,966	51,762
6	price Escalation	0	0	0
	Grand Total	23,796	27,966	51,762

OM Cost 1,353

Total

	Classification of Costs	Total L.C.	Total F.C.	Total
1	Construction Cost	77,784	98,488	176,273
2	Administration	294	0	294
3	Engineering Services	9,796	0	9,796
4	Land Acquisition	3,910	15,636	19,546
6	Physical Contingency	13,768	17,119	30,886
	Sub-total	105,552	131,243	236,795
7	price Escalation	0	0	0
	Grand Total	105,552	131,243	236,795

OM Cost 1,763

TABLA K.3.3(1) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO DEL QUEBRADA CHANE (ALTERNATIVE-1&-2)

(1) Financial Cost

1

Unit : Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total	
1	Construction Cost	0	0	0	
2	Land Acquisition	41	0	41	
3	Administration	2	0	2	
4	Engineering Services	65	230	295	
5	Physical Contingency	16	35	51	
	Sub-total	124	265	389	
6	price Escalation	50	57	107	
	Grand Total	174	322	496	OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total	
1	Construction Cost	2,880	2,539	5,419	
2	Land Acquisition	73	0	73	
3	Administration	275	0	275	
4	Engineering Services	318	1,127	1,445	
5	Physical Contingency	532	550	1,082	
	Sub-total	4,078	4,216	8,294	
6	price Escalation	2,042	1,119	3,161	
	Grand Total	6,120	5,335	11,455	OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total	
1	Construction Cost	12,181	10,739	22,920	
2	Land Acquisition	73	0	73	
3	Administration	1,150	0	1,150	
4	Engineering Services	458	1,623	2,081	
5	Physical Contingency	2,079	1,854	3,934	
	Sub-total	15,941	14,216	30,158	
6	price Escalation	9,657	4,491	14,148	
	Grand Total	25,598	18,707	44,306	OM Cost 87

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total	
1	Construction Cost	12,181	10,739	22,920	
2	Land Acquisition	74	0	74	
3	Administration	1,150	0	1,150	
4	Engineering Services	458	1,623	2,081	
5	Physical Contingency	2,079	1,854	3,934	
	Sub-total	15,942	14,216	30,159	
6	price Escalation	11,450	5,240	16,690	
	Grand Total	27,392	19,456	46,849	OM Cost 487

5

No.	Classification of Costs	2004 L.C.	2004 F.C.	2004 Total	
1	Construction Cost	12,181	10,739	22,920	
2	Land Acquisition	79	0	79	
3	Administration	1,150	0	1,150	
4	Engineering Services	445	1,574	2,019	
5	Physical Contingency	2,078	1,847	3,925	
	Sub-total	15,933	14,160	30,093	
6	price Escalation	13,360	5,994	19,354	
	Grand Total	29,293	20,154	49,447	OM Cost 942

(2) Economic Cost

1

Unit : Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total	
1	Construction Cost	0	0	0	
2	Land Acquisition	23	0	23	
3	Administration	2	0	2	
4	Engineering Services	58	230	288	
5	Physical Contingency	12	35	47	
	Sub-total	94	265	359	
6	price Escalation	0	0	0	
	Grand Total	94	265	359	OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total	
1	Construction Cost	2,045	2,247	4,292	
2	Land Acquisition	40	0	40	
3	Administration	243	0	243	
4	Engineering Services	281	1,127	1,408	
5	Physical Contingency	391	506	898	
	Sub-total	3,001	3,880	6,881	
6	price Escalation	0	0	0	
	Grand Total	3,001	3,880	6,881	OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total	
1	Construction Cost	8,649	9,504	18,152	
2	Land Acquisition	40	0	40	
3	Administration	1,018	0	1,018	
4	Engineering Services	405	1,623	2,028	
5	Physical Contingency	1,517	1,669	3,186	
	Sub-total	11,628	12,796	24,424	
6	price Escalation	0	0	0	
	Grand Total	11,628	12,796	24,424	OM Cost 43

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total	
1	Construction Cost	8,649	9,504	18,152	
2	Land Acquisition	41	0	41	
3	Administration	1,018	0	1,018	
4	Engineering Services	405	1,623	2,028	
5	Physical Contingency	1,517	1,669	3,186	
	Sub-total	11,629	12,796	24,425	
6	price Escalation	0	0	0	
	Grand Total	11,629	12,796	24,425	OM Cost 224

5

No.	Classification of Costs	2004 L.C.	2004 F.C.	2004 Total	
1	Construction Cost	8,649	9,504	18,152	
2	Land Acquisition	43	0	43	
3	Administration	1,018	0	1,018	
4	Engineering Services	391	1,574	1,968	
5	Physical Contingency	1,516	1,662	3,177	
	Sub-total	11,619	12,739	24,358	
6	price Escalation	0	0	0	
	Grand Total	11,619	12,739	24,358	OM Cost 406

TABLA K.3.3(2) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO DEL QUEBRADA CHANE (ALTERNATIVE-1&-2)

(1) Financial Cost

6

No.	Classification of Costs	2005 L.C.	2005 F.C.	2005 Total
1	Construction Cost	11,566	10,197	21,763
2	Land Acquisition	0	0	0
3	Administration	1,088	0	1,088
4	Engineering Services	174	616	790
5	Physical Contingency	1,924	1,622	3,546
	Sub-total	14,752	12,435	27,187
6	price Escalation	14,268	5,972	20,240
	Grand Total	29,020	18,407	47,427 OM Cost 1,459

Total

	Classification of Costs	Total L.C.	Total F.C.	Total
1	Construction Cost	50,989	44,953	95,942
2	Administration	340	0	340
3	Engineering Services	4,815	0	4,815
4	Land Acquisition	1,918	6,793	8,711
6	Physical Contingency	8,709	7,762	16,471
	Sub-total	66,771	59,508	126,279
7	price Escalation	50,827	22,873	73,700
	Grand Total	117,598	82,381	199,979 OM Cost 2,019

(2) Economic Cost

6

No.	Classification of Costs	2005 L.C.	2005 F.C.	2005 Total
1	Construction Cost	8,212	9,024	17,236
2	Land Acquisition	0	0	0
3	Administration	963	0	963
4	Engineering Services	154	616	770
5	Physical Contingency	1,399	1,446	2,845
	Sub-total	10,728	11,086	21,814
6	price Escalation	0	0	0
	Grand Total	10,728	11,086	21,814 OM Cost 587

Total

	Classification of Costs	Total L.C.	Total F.C.	Total
1	Construction Cost	36,202	39,781	75,984
2	Administration	187	0	187
3	Engineering Services	4,261	0	4,261
4	Land Acquisition	1,697	6,793	8,490
6	Physical Contingency	6,352	6,986	13,338
	Sub-total	48,700	53,561	102,260
7	price Escalation	0	0	0
	Grand Total	48,700	53,561	102,260 OM Cost 760

TABLA K.3.4(1) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO DEL CHANE CHACRAS (ALTERNATIVE-1&-2)

(1) Financial Cost

1 — Unit: Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total	
1	Construction Cost	0	0	0	
2	Land Acquisition	73	0	73	
3	Administration	4	0	4	
4	Engineering Services	157	558	715	
5	Physical Contingency	35	84	119	
	Sub-total	269	642	911	
6	price Escalation	108	139	247	
	Grand Total	377	781	1,158	OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total	
1	Construction Cost	6,628	6,496	13,124	
2	Land Acquisition	73	0	73	
3	Administration	600	0	600	
4	Engineering Services	262	929	1,191	
5	Physical Contingency	1,143	1,114	2,257	
	Sub-total	8,766	8,539	17,305	
6	price Escalation	4,390	2,266	6,656	
	Grand Total	13,156	10,805	23,961	OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total	
1	Construction Cost	6,628	6,496	13,124	
2	Land Acquisition	73	0	73	
3	Administration	600	0	600	
4	Engineering Services	262	929	1,191	
5	Physical Contingency	1,143	1,114	2,257	
	Sub-total	8,766	8,539	17,305	
6	price Escalation	5,311	2,698	8,009	
	Grand Total	14,077	11,237	25,314	OM Cost 211

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total	
1	Construction Cost	6,629	6,496	13,125	
2	Land Acquisition	215	0	215	
3	Administration	667	0	667	
4	Engineering Services	494	1,751	2,245	
5	Physical Contingency	1,201	1,237	2,438	
	Sub-total	9,206	9,484	18,690	
6	price Escalation	6,612	3,495	10,107	
	Grand Total	15,818	12,979	28,797	OM Cost 451

5

No.	Classification of Costs	2004 L.C.	2004 F.C.	2004 Total	
1	Construction Cost	16,389	16,060	32,449	
2	Land Acquisition	246	0	246	
3	Administration	1,635	0	1,635	
4	Engineering Services	833	2,948	3,781	
5	Physical Contingency	2,865	2,851	5,717	
	Sub-total	21,968	21,859	43,828	
6	price Escalation	18,419	9,253	27,672	
	Grand Total	40,387	31,112	71,500	OM Cost 724

(2) Economic Cost

1 — Unit: Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total	
1	Construction Cost	0	0	0	
2	Land Acquisition	40	0	40	
3	Administration	4	0	4	
4	Engineering Services	139	558	697	
5	Physical Contingency	27	84	111	
	Sub-total	210	642	852	
6	price Escalation	0	0	0	
	Grand Total	210	642	852	OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total	
1	Construction Cost	4,706	5,749	10,455	
2	Land Acquisition	40	0	40	
3	Administration	584	0	584	
4	Engineering Services	232	929	1,161	
5	Physical Contingency	834	1,002	1,836	
	Sub-total	6,396	7,679	14,076	
6	price Escalation	0	0	0	
	Grand Total	6,396	7,679	14,076	OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total	
1	Construction Cost	4,706	5,749	10,455	
2	Land Acquisition	40	0	40	
3	Administration	584	0	584	
4	Engineering Services	232	929	1,161	
5	Physical Contingency	834	1,002	1,836	
	Sub-total	6,396	7,679	14,076	
6	price Escalation	0	0	0	
	Grand Total	6,396	7,679	14,076	OM Cost 105

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total	
1	Construction Cost	4,707	5,749	10,455	
2	Land Acquisition	118	0	118	
3	Administration	590	0	590	
4	Engineering Services	437	1,751	2,188	
5	Physical Contingency	878	1,125	2,003	
	Sub-total	6,730	8,625	15,355	
6	price Escalation	0	0	0	
	Grand Total	6,730	8,625	15,355	OM Cost 209

5

No.	Classification of Costs	2004 L.C.	2004 F.C.	2004 Total	
1	Construction Cost	11,636	14,212	25,849	
2	Land Acquisition	135	0	135	
3	Administration	1,447	0	1,447	
4	Engineering Services	737	2,948	3,685	
5	Physical Contingency	2,093	2,574	4,667	
	Sub-total	16,049	19,734	35,783	
6	price Escalation	0	0	0	
	Grand Total	16,049	19,734	35,783	OM Cost 314

TABLA K.3.4(2) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO DEL CHANE CHACRAS (ALTERNATIVE-1&-2)

(1) Financial Cost

6

No.	Classification of Costs	2005 L.C.	2005 F.C.	2005 Total	
1	Construction Cost	24,119	23,636	47,755	
2	Land Acquisition	31	0	31	
3	Administration	2,389	0	2,389	
4	Engineering Services	566	2,002	2,568	
5	Physical Contingency	4,066	3,846	7,911	
	Sub-total	31,171	29,484	60,654	
6	price Escalation	30,147	14,159	44,306	
	Grand Total	61,318	43,643	104,960	OM Cost 1,413

7

No.	Classification of Costs	2006 L.C.	2006 F.C.	2006 Total	
1	Construction Cost	7,730	7,576	15,306	
2	Land Acquisition	31	0	31	
3	Administration	767	0	767	
4	Engineering Services	306	1,084	1,390	
5	Physical Contingency	1,325	1,299	2,624	
	Sub-total	10,159	9,959	20,118	
6	price Escalation	11,224	5,372	16,596	
	Grand Total	21,383	15,331	36,714	OM Cost 2,517

8

No.	Classification of Costs	2007 L.C.	2007 F.C.	2007 Total	
1	Construction Cost	7,730	7,576	15,306	
2	Land Acquisition	32	0	32	
3	Administration	767	0	767	
4	Engineering Services	306	1,084	1,390	
5	Physical Contingency	1,325	1,299	2,624	
	Sub-total	10,160	9,959	20,119	
6	price Escalation	12,723	5,985	18,708	
	Grand Total	22,883	15,944	38,827	OM Cost 3,038

9

No.	Classification of Costs	2008 L.C.	2008 F.C.	2008 Total	
1	Construction Cost	7,730	7,576	15,306	
2	Land Acquisition	0	0	0	
3	Administration	765	0	765	
4	Engineering Services	122	433	555	
5	Physical Contingency	1,293	1,201	2,494	
	Sub-total	9,910	9,210	19,120	
6	price Escalation	13,972	6,126	20,098	
	Grand Total	23,882	15,336	39,218	OM Cost 3,619

Total

	Classification of Costs	Total L.C.	Total F.C.	Total Total	
1	Construction Cost	83,583	81,912	165,495	
2	Administration	774	0	774	
3	Engineering Services	8,314	0	8,314	
4	Land Acquisition	3,308	11,718	15,026	
5	Physical Contingency	14,397	14,045	28,441	
	Sub-total	110,376	107,675	218,050	
6	price Escalation	102,906	49,493	152,399	
	Grand Total	213,282	157,168	370,449	OM Cost 4,267

(2) Economic Cost

6

No.	Classification of Costs	2005 L.C.	2005 F.C.	2005 Total	
1	Construction Cost	17,124	20,917	38,041	
2	Land Acquisition	17	0	17	
3	Administration	2,114	0	2,114	
4	Engineering Services	501	2,002	2,503	
5	Physical Contingency	2,963	3,438	6,401	
	Sub-total	22,720	26,357	49,077	
6	price Escalation	0	0	0	
	Grand Total	22,720	26,357	49,077	OM Cost 572

7

No.	Classification of Costs	2006 L.C.	2006 F.C.	2006 Total	
1	Construction Cost	5,488	6,704	12,193	
2	Land Acquisition	17	0	17	
3	Administration	679	0	679	
4	Engineering Services	271	1,084	1,355	
5	Physical Contingency	968	1,168	2,136	
	Sub-total	7,423	8,957	16,380	
6	price Escalation	0	0	0	
	Grand Total	7,423	8,957	16,380	OM Cost 953

8

No.	Classification of Costs	2007 L.C.	2007 F.C.	2007 Total	
1	Construction Cost	5,488	6,704	12,193	
2	Land Acquisition	18	0	18	
3	Administration	679	0	679	
4	Engineering Services	271	1,084	1,355	
5	Physical Contingency	968	1,168	2,137	
	Sub-total	7,424	8,957	16,380	
6	price Escalation	0	0	0	
	Grand Total	7,424	8,957	16,380	OM Cost 1,074

9

No.	Classification of Costs	2008 L.C.	2008 F.C.	2008 Total	
1	Construction Cost	5,488	6,704	12,193	
2	Land Acquisition	0	0	0	
3	Administration	677	0	677	
4	Engineering Services	108	433	541	
5	Physical Contingency	941	1,071	2,012	
	Sub-total	7,214	8,208	15,422	
6	price Escalation	0	0	0	
	Grand Total	7,214	8,208	15,422	OM Cost 1,196

Total

	Classification of Costs	Total L.C.	Total F.C.	Total Total	
1	Construction Cost	59,344	72,488	131,832	
2	Administration	426	0	426	
3	Engineering Services	7,358	0	7,358	
4	Land Acquisition	2,927	11,718	14,645	
5	Physical Contingency	10,508	12,631	23,139	
	Sub-total	80,563	96,837	177,400	
6	price Escalation	0	0	0	
	Grand Total	80,563	96,837	177,400	OM Cost 1,318

TABLA K.3.5(1) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO DEL OKINAWA DRENAJE (ALTERNATIVE-1&-2)

(1) Financial Cost

1

Unit : Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total
1	Construction Cost	0	0	0
2	Land Acquisition	119	0	119
3	Administration	6	0	6
4	Engineering Services	222	785	1,007
5	Physical Contingency	52	118	170
	Sub-total	399	903	1,302
6	price Escalation	160	196	356
	Grand Total	559	1,099	1,658

OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total
1	Construction Cost	9,016	9,462	18,478
2	Land Acquisition	120	0	120
3	Administration	930	0	930
4	Engineering Services	370	1,308	1,678
5	Physical Contingency	1,565	1,616	3,181
	Sub-total	12,001	12,386	24,387
6	price Escalation	6,009	3,286	9,295
	Grand Total	18,010	15,672	33,682

OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total
1	Construction Cost	9,016	9,463	18,479
2	Land Acquisition	22	0	22
3	Administration	925	0	925
4	Engineering Services	279	987	1,266
5	Physical Contingency	1,536	1,568	3,104
	Sub-total	11,778	12,018	23,796
6	price Escalation	7,135	3,797	10,932
	Grand Total	18,913	15,815	34,728

OM Cost 297

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total
1	Construction Cost	5,325	5,590	10,915
2	Land Acquisition	22	0	22
3	Administration	547	0	547
4	Engineering Services	218	773	991
5	Physical Contingency	917	954	1,871
	Sub-total	7,029	7,317	14,346
6	price Escalation	5,048	2,697	7,745
	Grand Total	12,077	10,014	22,091

OM Cost 635

5

No.	Classification of Costs	2004 L.C.	2004 F.C.	2004 Total
1	Construction Cost	5,326	5,590	10,916
2	Land Acquisition	23	0	23
3	Administration	547	0	547
4	Engineering Services	218	773	991
5	Physical Contingency	917	954	1,872
	Sub-total	7,031	7,317	14,349
6	price Escalation	5,896	3,097	8,993
	Grand Total	12,927	10,414	23,342

OM Cost 880

(2) Economic Cost

1

Unit : Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total
1	Construction Cost	0	0	0
2	Land Acquisition	65	0	65
3	Administration	5	0	5
4	Engineering Services	196	785	981
5	Physical Contingency	40	118	158
	Sub-total	307	903	1,210
6	price Escalation	0	0	0
	Grand Total	307	903	1,210

OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total
1	Construction Cost	6,401	8,373	14,775
2	Land Acquisition	66	0	66
3	Administration	823	0	823
4	Engineering Services	327	1,308	1,635
5	Physical Contingency	1,143	1,452	2,595
	Sub-total	8,760	11,134	19,894
6	price Escalation	0	0	0
	Grand Total	8,760	11,134	19,894

OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total
1	Construction Cost	6,401	8,374	14,776
2	Land Acquisition	12	0	12
3	Administration	819	0	819
4	Engineering Services	247	987	1,234
5	Physical Contingency	1,122	1,404	2,526
	Sub-total	8,601	10,766	19,366
6	price Escalation	0	0	0
	Grand Total	8,601	10,766	19,366

OM Cost 148

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total
1	Construction Cost	3,781	4,947	8,728
2	Land Acquisition	12	0	12
3	Administration	484	0	484
4	Engineering Services	193	773	966
5	Physical Contingency	670	858	1,528
	Sub-total	5,140	6,578	11,718
6	price Escalation	0	0	0
	Grand Total	5,140	6,578	11,718

OM Cost 296

5

No.	Classification of Costs	2004 L.C.	2004 F.C.	2004 Total
1	Construction Cost	3,781	4,947	8,728
2	Land Acquisition	13	0	13
3	Administration	484	0	484
4	Engineering Services	193	773	966
5	Physical Contingency	671	858	1,529
	Sub-total	5,142	6,578	11,720
6	price Escalation	0	0	0
	Grand Total	5,142	6,578	11,720

OM Cost 383

TABLA K.3.5(2) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO DEL OKINAWA DRENAJE (ALTERNATIVE-1&-2)

(1) Financial Cost

6

No.	Classification of Costs	2005 L.C.	2005 F.C.	2005 Total	
1	Construction Cost	5,326	5,500	10,916	
2	Land Acquisition	0	0	0	
3	Administration	546	0	546	
4	Engineering Services	87	309	396	
5	Physical Contingency	894	885	1,779	
	Sub-total	6,853	6,784	13,637	
6	price Escalation	6,628	3,258	9,886	
	Grand Total	13,481	10,042	23,523	OM Cost 1,156

Total

	Classification of Costs	Total L.C.	Total F.C.	Total	
1	Construction Cost	34,009	35,695	69,704	
2	Administration	306	0	306	
3	Engineering Services	3,501	0	3,501	
4	Land Acquisition	1,394	4,935	6,329	
6	Physical Contingency	5,882	6,095	11,976	
	Sub-total	45,092	46,725	91,816	
7	price Escalation	30,876	16,331	47,207	
	Grand Total	75,968	63,056	139,023	OM Cost 1,467

(2) Economic Cost

6

No.	Classification of Costs	2005 L.C.	2005 F.C.	2005 Total	
1	Construction Cost	3,781	4,947	8,728	
2	Land Acquisition	0	0	0	
3	Administration	483	0	483	
4	Engineering Services	77	309	386	
5	Physical Contingency	651	788	1,440	
	Sub-total	4,993	6,044	11,037	
6	price Escalation	0	0	0	
	Grand Total	4,993	6,044	11,037	OM Cost 470

Total

	Classification of Costs	Total L.C.	Total F.C.	Total	
1	Construction Cost	24,146	31,588	55,735	
2	Administration	168	0	168	
3	Engineering Services	3,098	0	3,098	
4	Land Acquisition	1,234	4,935	6,169	
6	Physical Contingency	4,297	5,479	9,776	
	Sub-total	32,944	42,002	74,946	
7	price Escalation	0	0	0	
	Grand Total	32,944	42,002	74,946	OM Cost 557

TABLA K.3.6(1) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO DEL SAN JUAN (ALTERNATIVE-1)

(1) Financial Cost

1 — Unit: Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total
1	Construction Cost	0	0	0
2	Land Acquisition	77	0	77
3	Administration	4	0	4
4	Engineering Services	193	683	876
5	Physical Contingency	41	102	144
	Sub-total	315	785	1,101
6	price Escalation	127	170	297
	Grand Total	442	955	1398 OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total
1	Construction Cost	7,721	8,357	16,078
2	Land Acquisition	77	0	77
3	Administration	808	0	808
4	Engineering Services	322	1,138	1,460
5	Physical Contingency	1,339	1,424	2,763
	Sub-total	10,267	10,919	21,186
6	price Escalation	5,141	2,897	8,038
	Grand Total	15,408	13,816	29,224 OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total
1	Construction Cost	7,721	8,358	16,079
2	Land Acquisition	70	0	70
3	Administration	807	0	807
4	Engineering Services	360	1,276	1,636
5	Physical Contingency	1,344	1,445	2,789
	Sub-total	10,302	11,079	21,381
6	price Escalation	6,241	3,500	9,741
	Grand Total	16,543	14,579	31,122 OM Cost 258

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total
1	Construction Cost	9,273	10,037	19,310
2	Land Acquisition	30	0	30
3	Administration	967	0	967
4	Engineering Services	328	1,162	1,490
5	Physical Contingency	1,500	1,680	3,270
	Sub-total	12,188	12,879	25,067
6	price Escalation	8,753	4,747	13,500
	Grand Total	20,941	17,626	38,567 OM Cost 553

5

No.	Classification of Costs	2004 L.C.	2004 F.C.	2004 Total
1	Construction Cost	6,959	7,532	14,491
2	Land Acquisition	0	0	0
3	Administration	725	0	725
4	Engineering Services	116	410	526
5	Physical Contingency	1,170	1,191	2,361
	Sub-total	8,970	9,133	18,103
6	price Escalation	7,520	3,866	11,386
	Grand Total	16,490	12,999	29,489 OM Cost 946

(2) Economic Cost

1 — Unit: Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total
1	Construction Cost	0	0	0
2	Land Acquisition	42	0	42
3	Administration	4	0	4
4	Engineering Services	171	683	854
5	Physical Contingency	33	102	135
	Sub-total	249	785	1,035
6	price Escalation	0	0	0
	Grand Total	249	785	1,035 OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total
1	Construction Cost	5,482	7,396	12,877
2	Land Acquisition	42	0	42
3	Administration	715	0	715
4	Engineering Services	285	1,138	1,423
5	Physical Contingency	979	1,280	2,259
	Sub-total	7,503	9,814	17,317
6	price Escalation	0	0	0
	Grand Total	7,503	9,814	17,317 OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total
1	Construction Cost	5,482	7,396	12,878
2	Land Acquisition	39	0	39
3	Administration	714	0	714
4	Engineering Services	319	1,276	1,595
5	Physical Contingency	983	1,301	2,284
	Sub-total	7,536	9,973	17,509
6	price Escalation	0	0	0
	Grand Total	7,536	9,973	17,509 OM Cost 129

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total
1	Construction Cost	6,584	8,882	15,466
2	Land Acquisition	17	0	17
3	Administration	856	0	856
4	Engineering Services	290	1,162	1,452
5	Physical Contingency	1,162	1,507	2,669
	Sub-total	8,908	11,551	20,459
6	price Escalation	0	0	0
	Grand Total	8,908	11,551	20,459 OM Cost 258

5

No.	Classification of Costs	2004 L.C.	2004 F.C.	2004 Total
1	Construction Cost	4,941	6,665	11,606
2	Land Acquisition	0	0	0
3	Administration	642	0	642
4	Engineering Services	103	410	513
5	Physical Contingency	853	1,061	1,914
	Sub-total	6,538	8,137	14,675
6	price Escalation	0	0	0
	Grand Total	6,538	8,137	14,675 OM Cost 412

TABLA K.3.6(2) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO DEL SAN JUAN (ALTERNATIVE-1)

(1) Financial Cost
Total

	Classification of Costs	Total L.C.	Total F.C.	Total Total	
1	Construction Cost	31,674	34,284	65,958	
2	Administration	254	0	254	
3	Engineering Services	3,311	0	3,311	
4	Land Acquisition	1,319	4,669	5,988	
6	Physical Contingency	5,484	5,843	11,327	
	Sub-total	42,042	44,796	86,838	
7	price Escalation	27,782	15,180	42,962	
	Grand Total	69,824	59,976	129,800	OM Cost 1,297

(2) Economic Cost
Total

	Classification of Costs	Total L.C.	Total F.C.	Total Total	
1	Construction Cost	22,489	30,340	52,828	
2	Administration	140	0	140	
3	Engineering Services	2,930	0	2,930	
4	Land Acquisition	1,167	4,669	5,836	
6	Physical Contingency	4,009	5,251	9,260	
	Sub-total	30,734	40,260	70,995	
7	price Escalation	0	0	0	
	Grand Total	30,734	40,260	70,995	OM Cost 528

TABLA K.3.7(1) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO DEL SAN JUAN (ALTERNATIVE-2)

(1) Financial Cost

1

Unit : Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total	
1	Construction Cost	0	0	0	
2	Land Acquisition	77	0	77	
3	Administration	4	0	4	
4	Engineering Services	247	876	1,123	
5	Physical Contingency	49	131	181	
	Sub-total	377	1,007	1,385	
6	price Escalation	152	218	370	
	Grand Total	529	1,225	1,755	OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total	
1	Construction Cost	9,911	10,712	20,623	
2	Land Acquisition	77	0	77	
3	Administration	1,035	0	1,035	
4	Engineering Services	412	1,460	1,872	
5	Physical Contingency	1,715	1,826	3,541	
	Sub-total	13,150	13,998	27,148	
6	price Escalation	6,585	3,714	10,299	
	Grand Total	19,735	17,712	37,447	OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total	
1	Construction Cost	9,912	10,712	20,624	
2	Land Acquisition	70	0	70	
3	Administration	1,035	0	1,035	
4	Engineering Services	393	1,391	1,784	
5	Physical Contingency	1,712	1,815	3,527	
	Sub-total	13,122	13,918	27,040	
6	price Escalation	7,949	4,397	12,346	
	Grand Total	21,071	18,315	39,386	OM Cost 331

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total	
1	Construction Cost	9,134	9,873	19,007	
2	Land Acquisition	30	0	30	
3	Administration	952	0	952	
4	Engineering Services	326	1,154	1,480	
5	Physical Contingency	1,566	1,654	3,220	
	Sub-total	12,008	12,681	24,689	
6	price Escalation	8,624	4,674	13,298	
	Grand Total	20,632	17,355	37,987	OM Cost 709

5

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total	
1	Construction Cost	6,964	7,527	14,491	
2	Land Acquisition	0	0	0	
3	Administration	725	0	725	
4	Engineering Services	116	410	526	
5	Physical Contingency	1,171	1,191	2,361	
	Sub-total	8,976	9,128	18,103	
6	price Escalation	7,525	3,864	11,389	
	Grand Total	16,501	12,992	29,492	OM Cost 1,108

(2) Economic Cost

1

Unit : Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total	
1	Construction Cost	0	0	0	
2	Land Acquisition	42	0	42	
3	Administration	4	0	4	
4	Engineering Services	219	876	1,095	
5	Physical Contingency	40	131	171	
	Sub-total	304	1,007	1,312	
6	price Escalation	0	0	0	
	Grand Total	304	1,007	1,312	OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total	
1	Construction Cost	7,037	9,480	16,516	
2	Land Acquisition	42	0	42	
3	Administration	916	0	916	
4	Engineering Services	365	1,460	1,825	
5	Physical Contingency	1,254	1,641	2,895	
	Sub-total	9,614	12,581	22,194	
6	price Escalation	0	0	0	
	Grand Total	9,614	12,581	22,194	OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total	
1	Construction Cost	7,038	9,480	16,517	
2	Land Acquisition	39	0	39	
3	Administration	916	0	916	
4	Engineering Services	348	1,391	1,739	
5	Physical Contingency	1,251	1,631	2,882	
	Sub-total	9,591	12,501	22,092	
6	price Escalation	0	0	0	
	Grand Total	9,591	12,501	22,092	OM Cost 165

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total	
1	Construction Cost	6,485	8,737	15,222	
2	Land Acquisition	17	0	17	
3	Administration	842	0	842	
4	Engineering Services	288	1,154	1,442	
5	Physical Contingency	1,145	1,484	2,629	
	Sub-total	8,777	11,375	20,152	
6	price Escalation	0	0	0	
	Grand Total	8,778	11,375	20,152	OM Cost 330

5

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total	
1	Construction Cost	4,944	6,661	11,606	
2	Land Acquisition	0	0	0	
3	Administration	642	0	642	
4	Engineering Services	103	410	513	
5	Physical Contingency	853	1,061	1,914	
	Sub-total	6,542	8,132	14,674	
6	price Escalation	0	0	0	
	Grand Total	6,542	8,132	14,674	OM Cost 483

TABLA K.3.7(2) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO DEL SAN JUAN (ALTERNATIVE-2)

(1) Financial Cost
Total

	Classification of Costs	Total L.C.	Total F.C.	Total Total	
1	Construction Cost	35,921	38,824	74,745	
2	Administration	254	0	254	
3	Engineering Services	3,751	0	3,751	
4	Land Acquisition	1,494	5,291	6,785	
6	Physical Contingency	6,213	6,617	12,830	
	Sub-total	47,633	50,732	98,365	
7	price Escalation	30,835	16,867	47,702	
	Grand Total	78,468	67,599	146,067	OM Cost 1,470

(2) Economic Cost
Total

	Classification of Costs	Total L.C.	Total F.C.	Total Total	
1	Construction Cost	25,504	34,358	59,861	
2	Administration	140	0	140	
3	Engineering Services	3,319	0	3,319	
4	Land Acquisition	1,322	5,291	6,613	
6	Physical Contingency	4,513	5,947	10,490	
	Sub-total	34,828	45,596	80,424	
7	price Escalation	0	0	0	
	Grand Total	34,828	45,596	80,424	OM Cost 599

TABLA K.3.8(1) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO DEL ANTOFAGASTA (ALTERNATIVE-1&-2)

(1) Financial Cost

1 — Unit: Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total	
1	Construction Cost	0	0	0	
2	Land Acquisition	239	0	239	
3	Administration	12	0	12	
4	Engineering Services	325	1,151	1,476	
5	Physical Contingency	86	173	259	
	Sub-total	662	1,324	1,986	
6	price Escalation	267	287	554	
	Grand Total	929	1,611	2,540	OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total	
1	Construction Cost	13,551	13,531	27,082	
2	Land Acquisition	188	0	188	
3	Administration	1,364	0	1,364	
4	Engineering Services	393	1,392	1,785	
5	Physical Contingency	2,324	2,238	4,563	
	Sub-total	17,820	17,161	34,982	
6	price Escalation	8,923	4,553	13,476	
	Grand Total	26,743	21,714	48,458	OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total	
1	Construction Cost	7,365	7,353	14,718	
2	Land Acquisition	62	0	62	
3	Administration	739	0	739	
4	Engineering Services	292	1,035	1,327	
5	Physical Contingency	1,269	1,258	2,527	
	Sub-total	9,727	9,646	19,373	
6	price Escalation	5,893	3,048	8,941	
	Grand Total	15,620	12,694	28,314	OM Cost 435

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total	
1	Construction Cost	7,285	7,275	14,560	
2	Land Acquisition	22	0	22	
3	Administration	729	0	729	
4	Engineering Services	235	832	1,067	
5	Physical Contingency	1,241	1,216	2,457	
	Sub-total	9,512	9,323	18,835	
6	price Escalation	6,831	3,436	10,267	
	Grand Total	16,343	12,759	29,102	OM Cost 718

5

No.	Classification of Costs	2004 L.C.	2004 F.C.	2004 Total	
1	Construction Cost	4,942	4,935	9,877	
2	Land Acquisition	23	0	23	
3	Administration	495	0	495	
4	Engineering Services	198	699	897	
5	Physical Contingency	849	845	1,694	
	Sub-total	6,507	6,479	12,986	
6	price Escalation	5,455	2,743	8,198	
	Grand Total	11,962	9,222	21,184	OM Cost 1,036

(2) Economic Cost

1 — Unit: Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total	
1	Construction Cost	0	0	0	
2	Land Acquisition	131	0	131	
3	Administration	11	0	11	
4	Engineering Services	288	1,151	1,439	
5	Physical Contingency	64	173	237	
	Sub-total	494	1,324	1,818	
6	price Escalation	0	0	0	
	Grand Total	494	1,324	1,818	OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total	
1	Construction Cost	9,621	11,974	21,596	
2	Land Acquisition	103	0	103	
3	Administration	1,207	0	1,207	
4	Engineering Services	348	1,392	1,740	
5	Physical Contingency	1,692	2,005	3,697	
	Sub-total	12,971	15,371	28,343	
6	price Escalation	0	0	0	
	Grand Total	12,971	15,371	28,343	OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total	
1	Construction Cost	5,229	6,507	11,736	
2	Land Acquisition	34	0	34	
3	Administration	654	0	654	
4	Engineering Services	258	1,035	1,293	
5	Physical Contingency	926	1,131	2,058	
	Sub-total	7,102	8,673	15,775	
6	price Escalation	0	0	0	
	Grand Total	7,102	8,673	15,775	OM Cost 216

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total	
1	Construction Cost	5,172	6,438	11,610	
2	Land Acquisition	12	0	12	
3	Administration	645	0	645	
4	Engineering Services	208	832	1,040	
5	Physical Contingency	906	1,091	1,996	
	Sub-total	6,943	8,361	15,304	
6	price Escalation	0	0	0	
	Grand Total	6,943	8,361	15,304	OM Cost 333

5

No.	Classification of Costs	2004 L.C.	2004 F.C.	2004 Total	
1	Construction Cost	3,509	4,367	7,876	
2	Land Acquisition	13	0	13	
3	Administration	438	0	438	
4	Engineering Services	175	699	874	
5	Physical Contingency	620	760	1,380	
	Sub-total	4,755	5,826	10,581	
6	price Escalation	0	0	0	
	Grand Total	4,755	5,826	10,581	OM Cost 449

TABLA K.3.8(2) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO DEL ANTOFAGASTA (ALTERNATIVE-1&- 2)

(1) Financial Cost

6

No.	Classification of Costs	2005 L.C.	2005 F.C.	2005 Total	
1	Construction Cost	4,943	4,935	9,878	
2	Land Acquisition	0	0	0	
3	Administration	494	0	494	
4	Engineering Services	79	280	359	
5	Physical Contingency	827	782	1,610	
	Sub-total	6,343	5,997	12,311	
6	price Escalation	6,135	2,880	9,015	
	Grand Total	12,478	8,877	21,356	OM Cost 1,303

Total

	Classification of Costs	Total L.C.	Total F.C.	Total	
1	Construction Cost	38,086	38,029	76,115	
2	Administration	534	0	534	
3	Engineering Services	3,833	0	3,833	
4	Land Acquisition	1,522	5,389	6,911	
6	Physical Contingency	6,596	6,513	13,109	
	Sub-total	50,571	49,931	100,502	
7	price Escalation	33,504	16,947	50,451	
	Grand Total	84,075	66,878	150,953	OM Cost 1,602

(2) Economic Cost

6

No.	Classification of Costs	2005 L.C.	2005 F.C.	2005 Total	
1	Construction Cost	3,510	4,367	7,877	
2	Land Acquisition	0	0	0	
3	Administration	437	0	437	
4	Engineering Services	70	280	350	
5	Physical Contingency	602	697	1,300	
	Sub-total	4,619	5,344	9,963	
6	price Escalation	0	0	0	
	Grand Total	4,619	5,344	9,963	OM Cost 528

Total

	Classification of Costs	Total L.C.	Total F.C.	Total	
1	Construction Cost	27,041	33,654	60,695	
2	Administration	294	0	294	
3	Engineering Services	3,392	0	3,392	
4	Land Acquisition	1,347	5,389	6,736	
6	Physical Contingency	4,811	5,856	10,668	
	Sub-total	36,885	44,899	81,784	
7	price Escalation	0	0	0	
	Grand Total	36,885	44,899	81,784	OM Cost 607

TABLA K.3.9(1) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO GLOBAL (ALTERNATIVE-1)

(1) Financial Cost

1 Unit: Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total
1	Construction Cost	0	0	0
2	Land Acquisition	699	0	699
3	Administration	35	0	35
4	Engineering Services	1,762	6,239	8,001
5	Physical Contingency	374	936	1,310
	Sub-total	2,870	7,175	10,045
6	price Escalation	1,155	1,554	2,709
	Grand Total	4,025	8,729	12,754 OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total
1	Construction Cost	72,004	74,795	146,799
2	Land Acquisition	682	0	682
3	Administration	7,374	0	7,374
4	Engineering Services	2,998	10,612	13,610
5	Physical Contingency	12,459	12,811	25,270
	Sub-total	95,517	98,218	193,735
6	price Escalation	47,828	26,059	73,887
	Grand Total	143,345	124,277	267,622 OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total
1	Construction Cost	75,119	76,819	151,938
2	Land Acquisition	452	0	452
3	Administration	7,620	0	7,620
4	Engineering Services	2,985	10,566	13,551
5	Physical Contingency	12,926	13,108	26,034
	Sub-total	99,102	100,493	199,595
6	price Escalation	60,034	31,749	91,783
	Grand Total	159,136	132,242	291,378 OM Cost 2,357

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total
1	Construction Cost	72,901	74,547	147,448
2	Land Acquisition	594	0	594
3	Administration	7,402	0	7,402
4	Engineering Services	3,187	11,283	14,470
5	Physical Contingency	12,613	12,875	25,487
	Sub-total	96,697	98,705	195,401
6	price Escalation	69,446	36,379	105,825
	Grand Total	166,143	135,084	301,226 OM Cost 5,133

5

No.	Classification of Costs	2004 L.C.	2004 F.C.	2004 Total
1	Construction Cost	82,980	84,318	167,298
2	Land Acquisition	546	0	546
3	Administration	8,392	0	8,392
4	Engineering Services	3,358	11,888	15,246
5	Physical Contingency	14,291	14,431	28,722
	Sub-total	109,567	110,637	220,204
6	price Escalation	91,868	46,834	138,702
	Grand Total	201,435	157,471	358,906 OM Cost 8,203

(2) Economic Cost

1 Unit: Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total
1	Construction Cost	0	0	0
2	Land Acquisition	384	0	384
3	Administration	31	0	31
4	Engineering Services	1,559	6,239	7,798
5	Physical Contingency	296	936	1,232
	Sub-total	2,271	7,175	9,446
6	price Escalation	0	0	0
	Grand Total	2,271	7,175	9,446 OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total
1	Construction Cost	51,123	66,190	117,313
2	Land Acquisition	375	0	375
3	Administration	6,526	0	6,526
4	Engineering Services	2,653	10,612	13,265
5	Physical Contingency	9,102	11,520	20,622
	Sub-total	69,778	88,323	158,101
6	price Escalation	0	0	0
	Grand Total	69,778	88,323	158,101 OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total
1	Construction Cost	53,334	67,981	121,316
2	Land Acquisition	249	0	249
3	Administration	6,743	0	6,743
4	Engineering Services	2,642	10,566	13,208
5	Physical Contingency	9,445	11,782	21,227
	Sub-total	72,413	90,330	162,743
6	price Escalation	0	0	0
	Grand Total	72,413	90,330	162,743 OM Cost 1,173

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total
1	Construction Cost	51,760	65,971	117,731
2	Land Acquisition	327	0	327
3	Administration	6,550	0	6,550
4	Engineering Services	2,820	11,283	14,103
5	Physical Contingency	9,219	11,588	20,807
	Sub-total	70,676	88,842	159,518
6	price Escalation	0	0	0
	Grand Total	70,676	88,842	159,518 OM Cost 2,386

5

No.	Classification of Costs	2004 L.C.	2004 F.C.	2004 Total
1	Construction Cost	58,916	74,618	133,533
2	Land Acquisition	300	0	300
3	Administration	7,427	0	7,427
4	Engineering Services	2,972	11,888	14,860
5	Physical Contingency	10,442	12,976	23,418
	Sub-total	80,056	99,482	179,538
6	price Escalation	0	0	0
	Grand Total	80,056	99,482	179,538 OM Cost 3,564

TABLA K.3.9(2) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO GLOBAL (ALTERNATIVE-1)

(1) Financial Cost

6

No.	Classification of Costs	2005 L.C.	2005 F.C.	2005 Total	
1	Construction Cost	83,814	84,507	168,321	
2	Land Acquisition	31	0	31	
3	Administration	8,418	0	8,418	
4	Engineering Services	1,530	5,414	6,944	
5	Physical Contingency	14,069	13,488	27,557	
	Sub-total	107,862	103,409	211,271	
6	price Escalation	104,319	49,662	153,981	
	Grand Total	212,181	153,071	365,252	OM Cost 12,068

7

No.	Classification of Costs	2006 L.C.	2006 F.C.	2006 Total	
1	Construction Cost	7,730	7,576	15,306	
2	Land Acquisition	31	0	31	
3	Administration	767	0	767	
4	Engineering Services	306	1,084	1,390	
5	Physical Contingency	1,325	1,299	2,624	
	Sub-total	10,159	9,959	20,118	
6	price Escalation	11,224	5,372	16,596	
	Grand Total	21,383	15,331	36,714	OM Cost 16,456

8

No.	Classification of Costs	2007 L.C.	2007 F.C.	2007 Total	
1	Construction Cost	7,730	7,576	15,306	
2	Land Acquisition	32	0	32	
3	Administration	767	0	767	
4	Engineering Services	306	1,084	1,390	
5	Physical Contingency	1,325	1,299	2,624	
	Sub-total	10,160	9,959	20,119	
6	price Escalation	12,723	5,985	18,708	
	Grand Total	22,883	15,944	38,827	OM Cost 17,952

9

No.	Classification of Costs	2008 L.C.	2008 F.C.	2008 Total	
1	Construction Cost	7,730	7,576	15,306	
2	Land Acquisition	0	0	0	
3	Administration	765	0	765	
4	Engineering Services	122	433	555	
5	Physical Contingency	1,293	1,201	2,494	
	Sub-total	9,910	9,210	19,120	
6	price Escalation	13,972	6,126	20,098	
	Grand Total	23,882	15,336	39,218	OM Cost 19,578

Total

	Classification of Costs	Total L.C.	Total F.C.	Total	
1	Construction Cost	410,008	417,714	827,722	
2	Administration	3,067	0	3,067	
3	Engineering Services	41,540	0	41,540	
4	Land Acquisition	16,554	58,603	75,157	
5	Physical Contingency	70,675	71,448	142,123	
	Sub-total	541,844	547,765	1,089,609	
6	price Escalation	412,569	209,720	622,289	
	Grand Total	954,413	757,485	1,711,898	OM Cost 21,343

(2) Economic Cost

6

No.	Classification of Costs	2005 L.C.	2005 F.C.	2005 Total	
1	Construction Cost	59,508	74,785	134,293	
2	Land Acquisition	17	0	17	
3	Administration	7,450	0	7,450	
4	Engineering Services	1,354	5,414	6,768	
5	Physical Contingency	10,249	12,030	22,279	
	Sub-total	78,578	92,229	170,807	
6	price Escalation	0	0	0	
	Grand Total	78,578	92,229	170,807	OM Cost 4,899

7

No.	Classification of Costs	2006 L.C.	2006 F.C.	2006 Total	
1	Construction Cost	5,488	6,704	12,193	
2	Land Acquisition	17	0	17	
3	Administration	679	0	679	
4	Engineering Services	271	1,084	1,355	
5	Physical Contingency	968	1,168	2,136	
	Sub-total	7,423	8,957	16,380	
6	price Escalation	0	0	0	
	Grand Total	7,423	8,957	16,380	OM Cost 6,242

8

No.	Classification of Costs	2007 L.C.	2007 F.C.	2007 Total	
1	Construction Cost	5,488	6,704	12,193	
2	Land Acquisition	18	0	18	
3	Administration	679	0	679	
4	Engineering Services	271	1,084	1,355	
5	Physical Contingency	968	1,168	2,137	
	Sub-total	7,424	8,957	16,380	
6	price Escalation	0	0	0	
	Grand Total	7,424	8,957	16,380	OM Cost 6,364

9

No.	Classification of Costs	2008 L.C.	2008 F.C.	2008 Total	
1	Construction Cost	5,488	6,704	12,193	
2	Land Acquisition	0	0	0	
3	Administration	677	0	677	
4	Engineering Services	108	433	541	
5	Physical Contingency	941	1,071	2,012	
	Sub-total	7,214	8,208	15,422	
6	price Escalation	0	0	0	
	Grand Total	7,214	8,208	15,422	OM Cost 6,486

Total

	Classification of Costs	Total L.C.	Total F.C.	Total	
1	Construction Cost	291,106	369,658	660,764	
2	Administration	1,687	0	1,687	
3	Engineering Services	36,761	0	36,761	
4	Land Acquisition	14,650	58,603	73,253	
5	Physical Contingency	51,630	64,239	115,870	
	Sub-total	395,834	492,501	888,334	
6	price Escalation	0	0	0	
	Grand Total	395,834	492,501	888,334	OM Cost 6,608

TABLA K.3.10(1) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO GLOBAL (ALTERNATIVE-2)

(1) Financial Cost

1

Unit : Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total	
1	Construction Cost	0	0	0	
2	Land Acquisition	635	0	635	
3	Administration	32	0	32	
4	Engineering Services	1,495	5,296	6,791	
5	Physical Contingency	324	794	1,119	
	Sub-total	2,486	6,090	8,577	
6	price Escalation	1,001	1,320	2,321	
	Grand Total	3,487	7,410	10,898	OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total	
1	Construction Cost	61,772	62,840	124,612	
2	Land Acquisition	617	0	617	
3	Administration	6,261	0	6,261	
4	Engineering Services	2,554	9,041	11,595	
5	Physical Contingency	10,681	10,782	21,463	
	Sub-total	81,885	82,663	164,548	
6	price Escalation	41,002	21,932	62,934	
	Grand Total	122,887	104,595	227,482	OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total	
1	Construction Cost	64,888	64,863	129,751	
2	Land Acquisition	387	0	387	
3	Administration	6,507	0	6,507	
4	Engineering Services	2,483	8,790	11,273	
5	Physical Contingency	11,140	11,048	22,188	
	Sub-total	85,405	84,701	170,106	
6	price Escalation	51,737	26,760	78,497	
	Grand Total	137,142	111,461	248,603	OM Cost 2,001

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total	
1	Construction Cost	60,340	60,073	120,413	
2	Land Acquisition	529	0	529	
3	Administration	6,047	0	6,047	
4	Engineering Services	2,650	9,382	12,032	
5	Physical Contingency	10,435	10,418	20,853	
	Sub-total	80,001	79,873	159,874	
6	price Escalation	57,456	29,439	86,895	
	Grand Total	137,457	109,312	246,769	OM Cost 4,370

5

No.	Classification of Costs	2004 L.C.	2004 F.C.	2004 Total	
1	Construction Cost	70,563	70,003	140,566	
2	Land Acquisition	481	0	481	
3	Administration	7,052	0	7,052	
4	Engineering Services	2,824	9,996	12,820	
5	Physical Contingency	12,138	12,000	24,138	
	Sub-total	93,058	91,999	185,057	
6	price Escalation	78,025	38,944	116,969	
	Grand Total	171,083	130,943	302,026	OM Cost 6,890

(2) Economic Cost

1

Unit : Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total	
1	Construction Cost	0	0	0	
2	Land Acquisition	349	0	349	
3	Administration	28	0	28	
4	Engineering Services	1,323	5,296	6,619	
5	Physical Contingency	255	794	1,049	
	Sub-total	1,956	6,090	8,046	
6	price Escalation	0	0	0	
	Grand Total	1,956	6,090	8,046	OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total	
1	Construction Cost	43,858	55,611	99,469	
2	Land Acquisition	339	0	339	
3	Administration	5,541	0	5,541	
4	Engineering Services	2,260	9,041	11,301	
5	Physical Contingency	7,800	9,698	17,497	
	Sub-total	59,798	74,349	134,147	
6	price Escalation	0	0	0	
	Grand Total	59,798	74,349	134,147	OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total	
1	Construction Cost	46,070	57,401	103,471	
2	Land Acquisition	213	0	213	
3	Administration	5,758	0	5,758	
4	Engineering Services	2,197	8,790	10,987	
5	Physical Contingency	8,136	9,929	18,064	
	Sub-total	62,375	76,120	138,494	
6	price Escalation	0	0	0	
	Grand Total	62,375	76,120	138,494	OM Cost 995

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total	
1	Construction Cost	42,841	53,162	96,003	
2	Land Acquisition	291	0	291	
3	Administration	5,351	0	5,351	
4	Engineering Services	2,345	9,382	11,727	
5	Physical Contingency	7,624	9,382	17,006	
	Sub-total	58,453	71,926	130,379	
6	price Escalation	0	0	0	
	Grand Total	58,453	71,926	130,379	OM Cost 2,029

5

No.	Classification of Costs	2004 L.C.	2004 F.C.	2004 Total	
1	Construction Cost	50,100	61,950	112,049	
2	Land Acquisition	265	0	265	
3	Administration	6,241	0	6,241	
4	Engineering Services	2,499	9,996	12,495	
5	Physical Contingency	8,866	10,792	19,657	
	Sub-total	67,970	82,737	150,707	
6	price Escalation	0	0	0	
	Grand Total	67,970	82,737	150,707	OM Cost 2,989

TABLA K.3.10(2) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO GLOBAL (ALTERNATIVE-2)

(1) Financial Cost

6

No.	Classification of Costs	2005 L.C.	2005 F.C.	2005 Total	
1	Construction Cost	71,391	70,198	141,589	
2	Land Acquisition	31	0	31	
3	Administration	7,081	0	7,081	
4	Engineering Services	1,316	4,657	5,973	
5	Physical Contingency	11,973	11,228	23,201	
	Sub-total	91,792	86,083	177,875	
6	price Escalation	88,777	41,341	130,118	
	Grand Total	180,569	127,424	307,993	OM Cost 10,138

7

No.	Classification of Costs	2006 L.C.	2006 F.C.	2006 Total	
1	Construction Cost	7,730	7,576	15,306	
2	Land Acquisition	31	0	31	
3	Administration	767	0	767	
4	Engineering Services	306	1,084	1,390	
5	Physical Contingency	1,325	1,299	2,624	
	Sub-total	10,159	9,959	20,118	
6	price Escalation	11,224	5,372	16,596	
	Grand Total	21,383	15,331	36,714	OM Cost 13,827

8

No.	Classification of Costs	2007 L.C.	2007 F.C.	2007 Total	
1	Construction Cost	7,730	7,576	15,306	
2	Land Acquisition	32	0	32	
3	Administration	767	0	767	
4	Engineering Services	306	1,084	1,390	
5	Physical Contingency	1,325	1,299	2,624	
	Sub-total	10,160	9,959	20,119	
6	price Escalation	12,723	5,985	18,708	
	Grand Total	22,883	15,944	38,827	OM Cost 15,140

9

No.	Classification of Costs	2008 L.C.	2008 F.C.	2008 Total	
1	Construction Cost	7,730	7,576	15,306	
2	Land Acquisition	0	0	0	
3	Administration	765	0	765	
4	Engineering Services	122	433	555	
5	Physical Contingency	1,293	1,201	2,494	
	Sub-total	9,910	9,210	19,120	
6	price Escalation	13,972	6,126	20,098	
	Grand Total	23,882	15,336	39,218	OM Cost 16,569

Total

	Classification of Costs	Total L.C.	Total F.C.	Total	
1	Construction Cost	352,141	350,705	702,849	
2	Administration	2,743	0	2,743	
3	Engineering Services	35,279	0	35,279	
4	Land Acquisition	14,056	49,763	63,819	
5	Physical Contingency	60,633	60,070	120,704	
	Sub-total	464,855	460,538	925,394	
6	price Escalation	355,917	177,219	533,136	
	Grand Total	820,772	637,757	1,458,530	OM Cost 18,123

(2) Economic Cost

6

No.	Classification of Costs	2005 L.C.	2005 F.C.	2005 Total	
1	Construction Cost	50,688	62,122	112,810	
2	Land Acquisition	17	0	17	
3	Administration	6,266	0	6,266	
4	Engineering Services	1,165	4,657	5,822	
5	Physical Contingency	8,720	10,017	18,737	
	Sub-total	66,856	76,796	143,652	
6	price Escalation	0	0	0	
	Grand Total	66,856	76,796	143,652	OM Cost 4,110

7

No.	Classification of Costs	2006 L.C.	2006 F.C.	2006 Total	
1	Construction Cost	5,488	6,704	12,193	
2	Land Acquisition	17	0	17	
3	Administration	679	0	679	
4	Engineering Services	271	1,084	1,355	
5	Physical Contingency	968	1,168	2,136	
	Sub-total	7,423	8,957	16,380	
6	price Escalation	0	0	0	
	Grand Total	7,423	8,957	16,380	OM Cost 5,238

8

No.	Classification of Costs	2007 L.C.	2007 F.C.	2007 Total	
1	Construction Cost	5,488	6,704	12,193	
2	Land Acquisition	18	0	18	
3	Administration	679	0	679	
4	Engineering Services	271	1,084	1,355	
5	Physical Contingency	968	1,168	2,137	
	Sub-total	7,424	8,957	16,380	
6	price Escalation	0	0	0	
	Grand Total	7,424	8,957	16,380	OM Cost 5,360

9

No.	Classification of Costs	2008 L.C.	2008 F.C.	2008 Total	
1	Construction Cost	5,488	6,704	12,193	
2	Land Acquisition	0	0	0	
3	Administration	677	0	677	
4	Engineering Services	108	433	541	
5	Physical Contingency	941	1,071	2,012	
	Sub-total	7,214	8,208	15,422	
6	price Escalation	0	0	0	
	Grand Total	7,214	8,208	15,422	OM Cost 5,482

Total

	Classification of Costs	Total L.C.	Total F.C.	Total	
1	Construction Cost	250,022	310,358	560,381	
2	Administration	1,509	0	1,509	
3	Engineering Services	31,220	0	31,220	
4	Land Acquisition	12,439	49,763	62,202	
5	Physical Contingency	44,279	54,018	98,297	
	Sub-total	339,469	414,140	753,608	
6	price Escalation	0	0	0	
	Grand Total	339,469	414,140	753,608	OM Cost 5,601

TABLA K.3.11(1) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO GLOBAL (ALTERNATIVE-1:PERIODO DE LA CONSTRUCCION)

(1) Financial Cost

1 — Unit : Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total
1	Construction Cost	0	0	0
2	Land Acquisition	499	0	499
3	Administration	25	0	25
4	Engineering Services	1,060	3,756	4,816
5	Physical Contingency	238	563	801
	Sub-total	1,822	4,319	6,141
6	price Escalation	733	936	1,669
	Grand Total	2,555	5,255	7,810 OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total
1	Construction Cost	42,710	45,660	88,370
2	Land Acquisition	450	0	450
3	Administration	4,441	0	4,441
4	Engineering Services	1,619	5,731	7,350
5	Physical Contingency	7,383	7,709	15,092
	Sub-total	56,603	59,100	115,703
6	price Escalation	28,343	15,680	44,023
	Grand Total	84,946	74,780	159,726 OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total
1	Construction Cost	36,524	39,484	76,008
2	Land Acquisition	292	0	292
3	Administration	3,815	0	3,815
4	Engineering Services	1,624	5,748	7,372
5	Physical Contingency	6,338	6,785	13,123
	Sub-total	48,593	52,017	100,610
6	price Escalation	29,437	16,434	45,871
	Grand Total	78,030	68,451	146,481 OM Cost 1,419

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total
1	Construction Cost	40,933	43,708	84,641
2	Land Acquisition	212	0	212
3	Administration	4,243	0	4,243
4	Engineering Services	1,579	5,589	7,168
5	Physical Contingency	7,045	7,395	14,440
	Sub-total	54,012	56,692	110,704
6	price Escalation	38,790	20,895	59,685
	Grand Total	92,802	77,587	170,389 OM Cost 2,824

5

No.	Classification of Costs	2004 L.C.	2004 F.C.	2004 Total
1	Construction Cost	36,277	38,863	75,140
2	Land Acquisition	184	0	184
3	Administration	3,766	0	3,766
4	Engineering Services	1,329	4,704	6,033
5	Physical Contingency	6,233	6,535	12,768
	Sub-total	47,789	50,102	97,891
6	price Escalation	40,070	21,209	61,279
	Grand Total	87,859	71,311	159,170 OM Cost 4,578

(2) Economic Cost

1 — Unit : Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total
1	Construction Cost	0	0	0
2	Land Acquisition	274	0	274
3	Administration	22	0	22
4	Engineering Services	938	3,756	4,694
5	Physical Contingency	185	563	749
	Sub-total	1,420	4,319	5,739
6	price Escalation	0	0	0
	Grand Total	1,420	4,319	5,739 OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total
1	Construction Cost	30,324	40,407	70,731
2	Land Acquisition	248	0	248
3	Administration	3,930	0	3,930
4	Engineering Services	1,433	5,731	7,164
5	Physical Contingency	5,390	6,921	12,311
	Sub-total	41,325	53,059	94,383
6	price Escalation	0	0	0
	Grand Total	41,325	53,059	94,383 OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total
1	Construction Cost	25,932	34,942	60,874
2	Land Acquisition	161	0	161
3	Administration	3,376	0	3,376
4	Engineering Services	1,437	5,748	7,185
5	Physical Contingency	4,636	6,103	10,739
	Sub-total	35,542	46,793	82,335
6	price Escalation	0	0	0
	Grand Total	35,542	46,793	82,335 OM Cost 707

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total
1	Construction Cost	29,062	38,680	67,742
2	Land Acquisition	117	0	117
3	Administration	3,755	0	3,755
4	Engineering Services	1,397	5,589	6,986
5	Physical Contingency	5,150	6,640	11,790
	Sub-total	39,481	50,909	90,390
6	price Escalation	0	0	0
	Grand Total	39,481	50,909	90,390 OM Cost 1,316

5

No.	Classification of Costs	2004 L.C.	2004 F.C.	2004 Total
1	Construction Cost	25,757	34,392	60,149
2	Land Acquisition	101	0	101
3	Administration	3,333	0	3,333
4	Engineering Services	1,176	4,704	5,880
5	Physical Contingency	4,555	5,864	10,419
	Sub-total	34,922	44,960	79,882
6	price Escalation	0	0	0
	Grand Total	34,922	44,960	79,882 OM Cost 1,993

TABLA K.3.11(2) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO GLOBAL (ALTERNATIVE-1:PERIODO DE LA CONSTRUCCION)

(1) Financial Cost

6

No.	Classification of Costs	2005 L.C.	2005 F.C.	2005 Total	
1	Construction Cost	29,321	31,330	60,651	
2	Land Acquisition	342	0	342	
3	Administration	3,050	0	3,050	
4	Engineering Services	1,418	5,021	6,439	
5	Physical Contingency	5,120	5,453	10,572	
	Sub-total	39,251	41,804	81,054	
6	price Escalation	37,961	20,076	58,037	
	Grand Total	77,212	61,880	139,091	OM Cost 6,377

7

No.	Classification of Costs	2006 L.C.	2006 F.C.	2006 Total	
1	Construction Cost	39,055	38,699	77,754	
2	Land Acquisition	405	0	405	
3	Administration	3,908	0	3,908	
4	Engineering Services	1,949	6,899	8,848	
5	Physical Contingency	6,798	6,840	13,637	
	Sub-total	52,115	52,438	104,552	
6	price Escalation	57,578	28,288	85,866	
	Grand Total	109,693	80,726	190,418	OM Cost 8,100

8

No.	Classification of Costs	2007 L.C.	2007 F.C.	2007 Total	
1	Construction Cost	56,086	54,475	110,561	
2	Land Acquisition	191	0	191	
3	Administration	5,538	0	5,538	
4	Engineering Services	1,822	6,449	8,271	
5	Physical Contingency	9,546	9,139	18,684	
	Sub-total	73,183	70,063	143,245	
6	price Escalation	91,638	42,110	133,748	
	Grand Total	164,821	112,173	276,993	OM Cost 10,418

9

No.	Classification of Costs	2008 L.C.	2008 F.C.	2008 Total	
1	Construction Cost	39,697	38,415	78,112	
2	Land Acquisition	271	0	271	
3	Administration	3,919	0	3,919	
4	Engineering Services	1,683	5,956	7,639	
5	Physical Contingency	6,836	6,656	13,491	
	Sub-total	52,406	51,027	103,432	
6	price Escalation	73,883	33,937	107,820	
	Grand Total	126,289	84,964	211,252	OM Cost 13,811

10

No.	Classification of Costs	2009 L.C.	2009 F.C.	2009 Total	
1	Construction Cost	44,672	43,467	88,139	
2	Land Acquisition	221	0	221	
3	Administration	4,418	0	4,418	
4	Engineering Services	1,765	6,249	8,014	
5	Physical Contingency	7,661	7,457	15,119	
	Sub-total	58,737	57,173	115,911	
6	price Escalation	92,719	41,832	134,551	
	Grand Total	151,456	99,005	250,462	OM Cost 16,792

(2) Economic Cost

6

No.	Classification of Costs	2005 L.C.	2005 F.C.	2005 Total	
1	Construction Cost	20,818	27,726	48,544	
2	Land Acquisition	188	0	188	
3	Administration	2,699	0	2,699	
4	Engineering Services	1,255	5,021	6,276	
5	Physical Contingency	3,741	4,912	8,656	
	Sub-total	28,704	37,659	66,363	
6	price Escalation	0	0	0	
	Grand Total	28,704	37,659	66,363	OM Cost 2,595

7

No.	Classification of Costs	2006 L.C.	2006 F.C.	2006 Total	
1	Construction Cost	27,729	34,247	61,976	
2	Land Acquisition	223	0	223	
3	Administration	3,458	0	3,458	
4	Engineering Services	1,725	6,899	8,624	
5	Physical Contingency	4,970	6,172	11,142	
	Sub-total	38,105	47,318	85,423	
6	price Escalation	0	0	0	
	Grand Total	38,105	47,318	85,423	OM Cost 3,080

8

No.	Classification of Costs	2007 L.C.	2007 F.C.	2007 Total	
1	Construction Cost	39,821	48,208	88,029	
2	Land Acquisition	105	0	105	
3	Administration	4,901	0	4,901	
4	Engineering Services	1,612	6,449	8,061	
5	Physical Contingency	6,966	8,199	15,164	
	Sub-total	53,405	62,856	116,261	
6	price Escalation	0	0	0	
	Grand Total	53,405	62,856	116,261	OM Cost 3,700

9

No.	Classification of Costs	2008 L.C.	2008 F.C.	2008 Total	
1	Construction Cost	28,185	33,996	62,180	
2	Land Acquisition	149	0	149	
3	Administration	3,468	0	3,468	
4	Engineering Services	1,489	5,956	7,445	
5	Physical Contingency	4,994	5,993	10,986	
	Sub-total	38,285	45,944	84,229	
6	price Escalation	0	0	0	
	Grand Total	38,285	45,944	84,229	OM Cost 4,580

10

No.	Classification of Costs	2009 L.C.	2009 F.C.	2009 Total	
1	Construction Cost	31,717	38,466	70,183	
2	Land Acquisition	122	0	122	
3	Administration	3,910	0	3,910	
4	Engineering Services	1,562	6,249	7,811	
5	Physical Contingency	5,597	6,707	12,304	
	Sub-total	42,907	51,423	94,330	
6	price Escalation	0	0	0	
	Grand Total	42,907	51,423	94,330	OM Cost 5,202

TABLA K.3.11(3) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO GLOBAL (ALTERNATIVE-1:PERIODO DE LA CONSTRUCCION)

(1) Financial Cost

11

No.	Classification of Costs	2010 L.C.	2010 F.C.	2010 Total	
1	Construction Cost	44,733	43,613	88,346	
2	Land Acquisition	0	0	0	
3	Administration	4,417	0	4,417	
4	Engineering Services	707	2,500	3,207	
5	Physical Contingency	7,479	6,917	14,396	
	Sub-total	57,336	53,030	110,366	
6	price Escalation	100,855	42,474	143,329	
	Grand Total	158,191	95,504	253,695	OM Cost 20,400

Total

	Classification of Costs	Total L.C.	Total F.C.	Total	
1	Construction Cost	410,008	417,714	827,722	
2	Administration	3,067	0	3,067	
3	Engineering Services	41,540	0	41,540	
4	Land Acquisition	16,555	58,602	75,157	
5	Physical Contingency	70,676	71,447	142,123	
	Sub-total	541,846	547,763	1,089,609	
6	price Escalation	592,007	283,871	875,878	
	Grand Total	1,133,853	831,634	1,965,487	OM Cost 24,436

(2) Economic Cost

11

No.	Classification of Costs	2010 L.C.	2010 F.C.	2010 Total	
1	Construction Cost	31,760	38,596	70,356	
2	Land Acquisition	0	0	0	
3	Administration	3,909	0	3,909	
4	Engineering Services	626	2,500	3,126	
5	Physical Contingency	5,444	6,164	11,609	
	Sub-total	41,739	47,260	88,999	
6	price Escalation	0	0	0	
	Grand Total	41,739	47,260	88,999	OM Cost 5,904

Total

	Classification of Costs	Total L.C.	Total F.C.	Total	
1	Construction Cost	291,106	369,658	660,764	
2	Administration	1,687	0	1,687	
3	Engineering Services	36,761	0	36,761	
4	Land Acquisition	14,650	58,602	73,252	
5	Physical Contingency	51,631	64,239	115,870	
	Sub-total	395,835	492,499	888,334	
6	price Escalation	0	0	0	
	Grand Total	395,835	492,499	888,334	OM Cost 6,608

TABLA K.3.12(1) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO GLOBAL (ALTERNATIVE-2:PERIODO DE LA CONSTRUCCION)

(1) Financial Cost

1

Unit : Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total	
1	Construction Cost	0	0	0	
2	Land Acquisition	521	0	521	
3	Administration	26	0	26	
4	Engineering Services	1,273	4,508	5,781	
5	Physical Contingency	273	676	949	
	Sub-total	2,093	5,184	7,277	
6	price Escalation	842	1,123	1,965	
	Grand Total	2,935	6,307	9,242	OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total	
1	Construction Cost	52,264	53,805	106,069	
2	Land Acquisition	471	0	471	
3	Administration	5,327	0	5,327	
4	Engineering Services	1,973	6,984	8,957	
5	Physical Contingency	9,005	9,118	18,124	
	Sub-total	69,040	69,907	138,948	
6	price Escalation	34,571	18,548	53,119	
	Grand Total	103,611	88,455	192,067	OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total	
1	Construction Cost	46,079	47,628	93,707	
2	Land Acquisition	314	0	314	
3	Administration	4,701	0	4,701	
4	Engineering Services	1,920	6,795	8,715	
5	Physical Contingency	7,952	8,163	16,116	
	Sub-total	60,966	62,586	123,553	
6	price Escalation	36,932	19,773	56,705	
	Grand Total	97,898	82,359	180,258	OM Cost 1,703

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total	
1	Construction Cost	48,158	49,334	97,492	
2	Land Acquisition	313	0	313	
3	Administration	4,890	0	4,890	
4	Engineering Services	1,960	6,938	8,898	
5	Physical Contingency	8,298	8,441	16,739	
	Sub-total	63,619	64,713	128,332	
6	price Escalation	45,690	23,851	69,541	
	Grand Total	109,309	88,564	197,873	OM Cost 3,433

5

No.	Classification of Costs	2004 L.C.	2004 F.C.	2004 Total	
1	Construction Cost	48,620	49,700	98,320	
2	Land Acquisition	229	0	229	
3	Administration	4,927	0	4,927	
4	Engineering Services	1,809	6,403	8,212	
5	Physical Contingency	8,338	8,415	16,753	
	Sub-total	63,923	64,518	128,441	
6	price Escalation	53,597	27,312	80,909	
	Grand Total	117,520	91,830	209,350	OM Cost 5,465

(2) Economic Cost

1

Unit : Bs. 1,000

No.	Classification of Costs	2000 L.C.	2000 F.C.	2000 Total	
1	Construction Cost	0	0	0	
2	Land Acquisition	287	0	287	
3	Administration	23	0	23	
4	Engineering Services	1,127	4,508	5,635	
5	Physical Contingency	215	676	892	
	Sub-total	1,652	5,184	6,836	
6	price Escalation	0	0	0	
	Grand Total	1,652	5,184	6,836	OM Cost 0

2

No.	Classification of Costs	2001 L.C.	2001 F.C.	2001 Total	
1	Construction Cost	37,107	47,615	84,722	
2	Land Acquisition	259	0	259	
3	Administration	4,714	0	4,714	
4	Engineering Services	1,746	6,984	8,730	
5	Physical Contingency	6,574	8,190	14,764	
	Sub-total	50,401	62,789	113,190	
6	price Escalation	0	0	0	
	Grand Total	50,401	62,789	113,190	OM Cost 0

3

No.	Classification of Costs	2002 L.C.	2002 F.C.	2002 Total	
1	Construction Cost	32,716	42,149	74,865	
2	Land Acquisition	173	0	173	
3	Administration	4,160	0	4,160	
4	Engineering Services	1,699	6,795	8,494	
5	Physical Contingency	5,812	7,342	13,154	
	Sub-total	44,560	56,285	100,846	
6	price Escalation	0	0	0	
	Grand Total	44,560	56,285	100,846	OM Cost 847

4

No.	Classification of Costs	2003 L.C.	2003 F.C.	2003 Total	
1	Construction Cost	34,192	43,658	77,851	
2	Land Acquisition	172	0	172	
3	Administration	4,327	0	4,327	
4	Engineering Services	1,735	6,938	8,673	
5	Physical Contingency	6,064	7,589	13,653	
	Sub-total	46,490	58,186	104,676	
6	price Escalation	0	0	0	
	Grand Total	46,490	58,186	104,676	OM Cost 1,596

5

No.	Classification of Costs	2004 L.C.	2004 F.C.	2004 Total	
1	Construction Cost	34,520	43,982	78,503	
2	Land Acquisition	126	0	126	
3	Administration	4,360	0	4,360	
4	Engineering Services	1,601	6,403	8,004	
5	Physical Contingency	6,091	7,558	13,649	
	Sub-total	46,698	57,943	104,641	
6	price Escalation	0	0	0	
	Grand Total	46,698	57,943	104,641	OM Cost 2,374

TABLA K.3.12(2) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO GLOBAL (ALTERNATIVE-2:PERIODO DE LA CONSTRUCCION)

(1) Financial Cost

6

No.	Classification of Costs	2005 L.C.	2005 F.C.	2005 Total	
1	Construction Cost	42,335	42,861	85,196	
2	Land Acquisition	256	0	256	
3	Administration	4,273	0	4,273	
4	Engineering Services	1,136	4,020	5,156	
5	Physical Contingency	7,200	7,032	14,232	
	Sub-total	55,200	53,913	109,113	
6	price Escalation	53,386	25,892	79,278	
	Grand Total	108,586	79,805	188,391	OM Cost 7,782

7

No.	Classification of Costs	2006 L.C.	2006 F.C.	2006 Total	
1	Construction Cost	19,269	18,599	37,868	
2	Land Acquisition	319	0	319	
3	Administration	1,909	0	1,909	
4	Engineering Services	1,151	4,075	5,226	
5	Physical Contingency	3,397	3,401	6,798	
	Sub-total	26,045	26,075	52,120	
6	price Escalation	28,777	14,067	42,844	
	Grand Total	54,822	40,142	94,964	OM Cost 10,120

8

No.	Classification of Costs	2007 L.C.	2007 F.C.	2007 Total	
1	Construction Cost	36,300	34,375	70,675	
2	Land Acquisition	104	0	104	
3	Administration	3,539	0	3,539	
4	Engineering Services	1,024	3,625	4,649	
5	Physical Contingency	6,145	5,700	11,845	
	Sub-total	47,112	43,700	90,812	
6	price Escalation	58,994	26,265	85,259	
	Grand Total	106,106	69,965	176,071	OM Cost 11,681

9

No.	Classification of Costs	2008 L.C.	2008 F.C.	2008 Total	
1	Construction Cost	19,911	18,315	38,226	
2	Land Acquisition	105	0	105	
3	Administration	1,917	0	1,917	
4	Engineering Services	765	2,706	3,471	
5	Physical Contingency	3,405	3,153	6,558	
	Sub-total	26,103	24,174	50,277	
6	price Escalation	36,799	16,078	52,877	
	Grand Total	62,902	40,252	103,154	OM Cost 14,202

10

No.	Classification of Costs	2009 L.C.	2009 F.C.	2009 Total	
1	Construction Cost	19,912	18,315	38,227	
2	Land Acquisition	111	0	111	
3	Administration	1,917	0	1,917	
4	Engineering Services	751	2,657	3,408	
5	Physical Contingency	3,404	3,146	6,549	
	Sub-total	26,095	24,118	50,212	
6	price Escalation	41,190	17,647	58,837	
	Grand Total	67,285	41,765	109,049	OM Cost 16,182

(2) Economic Cost

6

No.	Classification of Costs	2005 L.C.	2005 F.C.	2005 Total	
1	Construction Cost	30,058	37,930	67,988	
2	Land Acquisition	141	0	141	
3	Administration	3,781	0	3,781	
4	Engineering Services	1,005	4,020	5,025	
5	Physical Contingency	5,248	6,293	11,540	
	Sub-total	40,233	48,243	88,476	
6	price Escalation	0	0	0	
	Grand Total	40,233	48,243	88,476	OM Cost 3,159

7

No.	Classification of Costs	2006 L.C.	2006 F.C.	2006 Total	
1	Construction Cost	13,681	16,459	30,140	
2	Land Acquisition	175	0	175	
3	Administration	1,689	0	1,689	
4	Engineering Services	1,019	4,075	5,094	
5	Physical Contingency	2,485	3,080	5,565	
	Sub-total	19,049	23,614	42,664	
6	price Escalation	0	0	0	
	Grand Total	19,049	23,614	42,664	OM Cost 3,839

8

No.	Classification of Costs	2007 L.C.	2007 F.C.	2007 Total	
1	Construction Cost	25,773	30,420	56,193	
2	Land Acquisition	57	0	57	
3	Administration	3,132	0	3,132	
4	Engineering Services	906	3,625	4,531	
5	Physical Contingency	4,480	5,107	9,587	
	Sub-total	34,348	39,152	73,501	
6	price Escalation	0	0	0	
	Grand Total	34,348	39,152	73,501	OM Cost 4,141

9

No.	Classification of Costs	2008 L.C.	2008 F.C.	2008 Total	
1	Construction Cost	14,137	16,208	30,345	
2	Land Acquisition	58	0	58	
3	Administration	1,696	0	1,696	
4	Engineering Services	677	2,706	3,383	
5	Physical Contingency	2,485	2,837	5,322	
	Sub-total	19,053	21,751	40,804	
6	price Escalation	0	0	0	
	Grand Total	19,053	21,751	40,804	OM Cost 4,708

10

No.	Classification of Costs	2009 L.C.	2009 F.C.	2009 Total	
1	Construction Cost	14,138	16,208	30,345	
2	Land Acquisition	61	0	61	
3	Administration	1,696	0	1,696	
4	Engineering Services	665	2,657	3,322	
5	Physical Contingency	2,484	2,830	5,314	
	Sub-total	19,044	21,695	40,738	
6	price Escalation	0	0	0	
	Grand Total	19,044	21,695	40,738	OM Cost 5,006

TABLA K.3.12(3) ESTIMACION DEL COSTO ECONOMICO SOBRE EL PROYECTO GLOBAL (ALTERNATIVE-2:PERIODO DE LA CONSTRUCCION)

(1) Financial Cost

11

No.	Classification of Costs	2010			
		L.C.	F.C.	Total	
1	Construction Cost	19,296	17,773	37,069	
2	Land Acquisition	0	0	0	
3	Administration	1,853	0	1,853	
4	Engineering Services	297	1,049	1,346	
5	Physical Contingency	3,217	2,823	6,040	
	Sub-total	24,663	21,645	46,308	
6	price Escalation	43,383	17,337	60,720	
	Grand Total	68,046	38,982	107,028	OM Cost 18,369

Total

	Classification of Costs	Total			
		L.C.	F.C.	Total	
1	Construction Cost	352,144	350,705	702,849	
2	Administration	2,743	0	2,743	
3	Engineering Services	35,279	0	35,279	
4	Land Acquisition	14,059	49,760	63,819	
5	Physical Contingency	60,634	60,070	120,704	
	Sub-total	464,859	460,535	925,394	
6	price Escalation	434,161	207,893	642,054	
	Grand Total	899,020	668,428	1,567,448	OM Cost 20,749

(2) Economic Cost

11

No.	Classification of Costs	2010			
		L.C.	F.C.	Total	
1	Construction Cost	13,700	15,728	29,428	
2	Land Acquisition	0	0	0	
3	Administration	1,640	0	1,640	
4	Engineering Services	263	1,049	1,312	
5	Physical Contingency	2,340	2,517	4,857	
	Sub-total	17,943	19,294	37,237	
6	price Escalation	0	0	0	
	Grand Total	17,943	19,294	37,237	OM Cost 5,310

Total

	Classification of Costs	Total			
		L.C.	F.C.	Total	
1	Construction Cost	250,022	310,358	560,381	
2	Administration	1,509	0	1,509	
3	Engineering Services	31,220	0	31,220	
4	Land Acquisition	12,442	49,760	62,202	
5	Physical Contingency	44,279	54,018	98,297	
	Sub-total	339,472	414,136	753,608	
6	price Escalation	0	0	0	
	Grand Total	339,472	414,136	753,608	OM Cost 5,604

TABLA K.4.1 ANALISIS ECONOMICO DEL PLANO DE ALTERNATIVA-1

I-1. Rio Chane

Unit: Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	1,677	0	1,677	0	-1,677
2	2001	28,832	0	28,832	0	-28,832
3	2002	28,832	215	29,047	359	-28,688
4	2003	28,832	430	29,262	718	-28,544
5	2004	28,832	645	29,477	1,077	-28,400
6	2005	27,155	859	28,014	1,435	-26,579
7	2006	0	1,074	1,074	1,794	720
8	2007	0	1,074	1,074	1,794	720
9	2008	0	1,074	1,074	1,794	720
10	2009	0	1,074	1,074	1,794	720
11	2010	0	1,074	1,074	1,794	720
12	2011	0	1,074	1,074	1,794	720
13	2012	0	1,074	1,074	1,794	720
14	2013	0	1,074	1,074	1,794	720
15	2014	0	1,074	1,074	1,794	720
16	2015	0	1,074	1,074	1,794	720
17	2016	0	1,074	1,074	1,794	720
18	2017	0	1,074	1,074	1,794	720
19	2018	0	1,074	1,074	1,794	720
20	2019	0	1,074	1,074	1,794	720
21	2020	0	1,074	1,074	1,794	720
22	2021	0	1,074	1,074	1,794	720
23	2022	0	1,074	1,074	1,794	720
24	2023	0	1,074	1,074	1,794	720
25	2024	0	1,074	1,074	1,794	720
26	2025	0	1,074	1,074	1,794	720
27	2026	0	1,074	1,074	1,794	720
28	2027	0	1,074	1,074	1,794	720
29	2028	0	1,074	1,074	1,794	720
30	2029	0	1,074	1,074	1,794	720
31	2030	0	1,074	1,074	1,794	720
32	2031	0	1,074	1,074	1,794	720
33	2032	0	1,074	1,074	1,794	720
34	2033	0	1,074	1,074	1,794	720
35	2034	0	1,074	1,074	1,794	720
36	2035	0	1,074	1,074	1,794	720
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
	Total	144,160	34,369	178,529	57,410	-121,119

EIRR (%) #DIV/0!

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.08	88,904	6,895	-82,009
12	0.09	99,055	9,372	-89,684
10	0.11	106,994	11,786	-95,208
5	0.18	133,235	23,395	-109,840
3	0.22	147,904	32,547	-115,358

I-2. Rio Pallon

Unit: Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	2,495	0	2,495	0	-2,495
2	2001	42,760	0	42,760	0	-42,760
3	2002	42,760	318	43,078	6,575	-36,503
4	2003	43,426	637	44,063	13,171	-30,892
5	2004	53,592	955	54,547	19,747	-34,800
6	2005	51,762	1,353	53,115	27,976	-25,139
7	2006	0	1,763	1,763	36,454	34,691
8	2007	0	1,763	1,763	36,454	34,691
9	2008	0	1,763	1,763	36,454	34,691
10	2009	0	1,763	1,763	36,454	34,691
11	2010	0	1,763	1,763	36,454	34,691
12	2011	0	1,763	1,763	36,454	34,691
13	2012	0	1,763	1,763	36,454	34,691
14	2013	0	1,763	1,763	36,454	34,691
15	2014	0	1,763	1,763	36,454	34,691
16	2015	0	1,763	1,763	36,454	34,691
17	2016	0	1,763	1,763	36,454	34,691
18	2017	0	1,763	1,763	36,454	34,691
19	2018	0	1,763	1,763	36,454	34,691
20	2019	0	1,763	1,763	36,454	34,691
21	2020	0	1,763	1,763	36,454	34,691
22	2021	0	1,763	1,763	36,454	34,691
23	2022	0	1,763	1,763	36,454	34,691
24	2023	0	1,763	1,763	36,454	34,691
25	2024	0	1,763	1,763	36,454	34,691
26	2025	0	1,763	1,763	36,454	34,691
27	2026	0	1,763	1,763	36,454	34,691
28	2027	0	1,763	1,763	36,454	34,691
29	2028	0	1,763	1,763	36,454	34,691
30	2029	0	1,763	1,763	36,454	34,691
31	2030	0	1,763	1,763	36,454	34,691
32	2031	0	1,763	1,763	36,454	34,691
33	2032	0	1,763	1,763	36,454	34,691
34	2033	0	1,763	1,763	36,454	34,691
35	2034	0	1,763	1,763	36,454	34,691
36	2035	0	1,763	1,763	36,454	34,691
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
	Total	236,795	56,153	292,948	1,161,000	868,142

EIRR (%) 14.33

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.96	143,107	137,247	-5,860
12	1.17	160,037	187,198	27,162
10	1.36	173,301	235,970	62,670
5	2.17	217,222	471,034	253,813
3	2.72	241,775	656,578	414,803

TABLA K.4.2 ANALISIS ECONOMICO DEL PLANO DE ALTERNATIVA-1

I-3. Quebrada Chane

Unit : Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	359	0	359	0	-359
2	2001	6,811	0	6,811	0	-6,811
3	2002	24,424	43	24,467	790	-23,677
4	2003	24,425	224	24,649	4,115	-20,534
5	2004	24,358	406	24,764	7,458	-17,306
6	2005	21,814	587	22,401	10,782	-11,619
7	2006	0	760	760	13,960	13,200
8	2007	0	760	760	13,960	13,200
9	2008	0	760	760	13,960	13,200
10	2009	0	760	760	13,960	13,200
11	2010	0	760	760	13,960	13,200
12	2011	0	760	760	13,960	13,200
13	2012	0	760	760	13,960	13,200
14	2013	0	760	760	13,960	13,200
15	2014	0	760	760	13,960	13,200
16	2015	0	760	760	13,960	13,200
17	2016	0	760	760	13,960	13,200
18	2017	0	760	760	13,960	13,200
19	2018	0	760	760	13,960	13,200
20	2019	0	760	760	13,960	13,200
21	2020	0	760	760	13,960	13,200
22	2021	0	760	760	13,960	13,200
23	2022	0	760	760	13,960	13,200
24	2023	0	760	760	13,960	13,200
25	2024	0	760	760	13,960	13,200
26	2025	0	760	760	13,960	13,200
27	2026	0	760	760	13,960	13,200
28	2027	0	760	760	13,960	13,200
29	2028	0	760	760	13,960	13,200
30	2029	0	760	760	13,960	13,200
31	2030	0	760	760	13,960	13,200
32	2031	0	760	760	13,960	13,200
33	2032	0	760	760	13,960	13,200
34	2033	0	760	760	13,960	13,200
35	2034	0	760	760	13,960	13,200
36	2035	0	760	760	13,960	13,200
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
	Total	102,191	24,060	126,251	441,944	315,693

EIRR (%) 12.52

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.85	59,797	50,869	-8,928
12	1.01	67,333	69,842	2,510
10	1.21	73,239	88,405	15,166
5	1.92	92,771	178,094	85,323
3	2.40	103,657	248,996	145,338

I-4. Chane Chacras

Unit : Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	852	0	852	0	-852
2	2001	14,076	0	14,076	0	-14,076
3	2002	14,076	105	14,181	2,317	-11,864
4	2003	15,355	209	15,564	4,612	-10,952
5	2004	35,783	314	36,097	6,930	-29,167
6	2005	49,077	572	49,649	12,623	-37,026
7	2006	16,380	953	17,333	21,032	3,699
8	2007	16,380	1,074	17,454	23,702	6,248
9	2008	15,422	1,196	16,618	26,395	9,777
10	2009	0	1,318	1,318	29,087	27,769
11	2010	0	1,318	1,318	29,087	27,769
12	2011	0	1,318	1,318	29,087	27,769
13	2012	0	1,318	1,318	29,087	27,769
14	2013	0	1,318	1,318	29,087	27,769
15	2014	0	1,318	1,318	29,087	27,769
16	2015	0	1,318	1,318	29,087	27,769
17	2016	0	1,318	1,318	29,087	27,769
18	2017	0	1,318	1,318	29,087	27,769
19	2018	0	1,318	1,318	29,087	27,769
20	2019	0	1,318	1,318	29,087	27,769
21	2020	0	1,318	1,318	29,087	27,769
22	2021	0	1,318	1,318	29,087	27,769
23	2022	0	1,318	1,318	29,087	27,769
24	2023	0	1,318	1,318	29,087	27,769
25	2024	0	1,318	1,318	29,087	27,769
26	2025	0	1,318	1,318	29,087	27,769
27	2026	0	1,318	1,318	29,087	27,769
28	2027	0	1,318	1,318	29,087	27,769
29	2028	0	1,318	1,318	29,087	27,769
30	2029	0	1,318	1,318	29,087	27,769
31	2030	0	1,318	1,318	29,087	27,769
32	2031	0	1,318	1,318	29,087	27,769
33	2032	0	1,318	1,318	29,087	27,769
34	2033	0	1,318	1,318	29,087	27,769
35	2034	0	1,318	1,318	29,087	27,769
36	2035	0	1,318	1,318	29,087	27,769
37	2036	0	1,318	1,318	29,087	27,769
38	2037	0	1,318	1,318	29,087	27,769
39	2038	0	1,318	1,318	29,087	27,769
	Total	177,401	43,963	221,364	970,221	748,857

EIRR (%) 15.38

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	1.02	88,424	90,511	2,087
12	1.25	102,314	128,004	25,690
10	1.46	113,485	165,651	52,166
5	2.35	151,869	356,879	205,009
3	2.96	174,026	515,757	341,731

TABLA K.4.3 ANALISIS ECONOMICO DEL PLANO DE ALTERNATIVA-1

I-5. Okinawa Drainage

Unit : Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	1,210	0	1,210	0	-1,210
2	2001	19,894	0	19,894	0	-19,894
3	2002	19,366	148	19,514	2,657	-16,857
4	2003	11,718	296	12,014	5,314	-6,700
5	2004	11,720	383	12,103	6,876	-5,227
6	2005	11,037	470	11,507	8,438	-3,069
7	2006	0	557	557	10,000	9,443
8	2007	0	557	557	10,000	9,443
9	2008	0	557	557	10,000	9,443
10	2009	0	557	557	10,000	9,443
11	2010	0	557	557	10,000	9,443
12	2011	0	557	557	10,000	9,443
13	2012	0	557	557	10,000	9,443
14	2013	0	557	557	10,000	9,443
15	2014	0	557	557	10,000	9,443
16	2015	0	557	557	10,000	9,443
17	2016	0	557	557	10,000	9,443
18	2017	0	557	557	10,000	9,443
19	2018	0	557	557	10,000	9,443
20	2019	0	557	557	10,000	9,443
21	2020	0	557	557	10,000	9,443
22	2021	0	557	557	10,000	9,443
23	2022	0	557	557	10,000	9,443
24	2023	0	557	557	10,000	9,443
25	2024	0	557	557	10,000	9,443
26	2025	0	557	557	10,000	9,443
27	2026	0	557	557	10,000	9,443
28	2027	0	557	557	10,000	9,443
29	2028	0	557	557	10,000	9,443
30	2029	0	557	557	10,000	9,443
31	2030	0	557	557	10,000	9,443
32	2031	0	557	557	10,000	9,443
33	2032	0	557	557	10,000	9,443
34	2033	0	557	557	10,000	9,443
35	2034	0	557	557	10,000	9,443
36	2035	0	557	557	10,000	9,443
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
	Total	74,945	18,007	92,952	323,285	230,333

EIRR (%) 12.21

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.83	48,368	40,239	-8,129
12	1.02	53,435	54,255	820
10	1.18	57,383	67,871	10,488
5	1.89	70,397	133,063	62,666
3	2.37	77,679	184,302	106,623

I-6. Total of The East Area Project

Unit : Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	6,593	0	6,593	0	-6,593
2	2001	112,373	0	112,373	0	-112,373
3	2002	129,458	829	130,287	12,699	-117,588
4	2003	123,756	1,796	125,552	27,931	-97,621
5	2004	154,285	2,703	156,988	42,088	-114,900
6	2005	160,845	3,841	164,686	61,255	-103,431
7	2006	16,380	5,107	21,487	83,240	61,753
8	2007	16,380	5,228	21,608	85,910	64,302
9	2008	15,422	5,350	20,772	88,603	67,831
10	2009	0	5,472	5,472	91,295	85,823
11	2010	0	5,472	5,472	91,295	85,823
12	2011	0	5,472	5,472	91,295	85,823
13	2012	0	5,472	5,472	91,295	85,823
14	2013	0	5,472	5,472	91,295	85,823
15	2014	0	5,472	5,472	91,295	85,823
16	2015	0	5,472	5,472	91,295	85,823
17	2016	0	5,472	5,472	91,295	85,823
18	2017	0	5,472	5,472	91,295	85,823
19	2018	0	5,472	5,472	91,295	85,823
20	2019	0	5,472	5,472	91,295	85,823
21	2020	0	5,472	5,472	91,295	85,823
22	2021	0	5,472	5,472	91,295	85,823
23	2022	0	5,472	5,472	91,295	85,823
24	2023	0	5,472	5,472	91,295	85,823
25	2024	0	5,472	5,472	91,295	85,823
26	2025	0	5,472	5,472	91,295	85,823
27	2026	0	5,472	5,472	91,295	85,823
28	2027	0	5,472	5,472	91,295	85,823
29	2028	0	5,472	5,472	91,295	85,823
30	2029	0	5,472	5,472	91,295	85,823
31	2030	0	5,472	5,472	91,295	85,823
32	2031	0	5,472	5,472	91,295	85,823
33	2032	0	5,472	5,472	91,295	85,823
34	2033	0	5,472	5,472	91,295	85,823
35	2034	0	5,472	5,472	91,295	85,823
36	2035	0	5,472	5,472	91,295	85,823
37	2036	0	1,318	1,318	29,087	27,769
38	2037	0	1,318	1,318	29,087	27,769
39	2038	0	1,318	1,318	29,087	27,769
	Total	735,492	176,552	912,044	2,953,951	2041906.6

EIRR (%) 11.04

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.76	428,600	325,761	-102,839
12	0.93	482,174	448,672	-33,502
10	1.09	524,401	569,684	45,283
5	1.75	665,491	1,162,465	496,971
3	2.20	745,042	1,638,179	893,137

TABLA K.4.4 ANALISIS ECONOMICO DEL PLANO DE ALTERNATIVA-1

II-1. San Juan

Unit: Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	1,035	0	1,035	0	-1,035
2	2001	17,317	0	17,317	0	-17,317
3	2002	17,509	129	17,638	1,959	-15,679
4	2003	20,459	258	20,717	3,918	-16,799
5	2004	14,675	412	15,087	6,256	-8,831
6	2005	0	528	528	8,018	7,490
7	2006	0	528	528	8,018	7,490
8	2007	0	528	528	8,018	7,490
9	2008	0	528	528	8,018	7,490
10	2009	0	528	528	8,018	7,490
11	2010	0	528	528	8,018	7,490
12	2011	0	528	528	8,018	7,490
13	2012	0	528	528	8,018	7,490
14	2013	0	528	528	8,018	7,490
15	2014	0	528	528	8,018	7,490
16	2015	0	528	528	8,018	7,490
17	2016	0	528	528	8,018	7,490
18	2017	0	528	528	8,018	7,490
19	2018	0	528	528	8,018	7,490
20	2019	0	528	528	8,018	7,490
21	2020	0	528	528	8,018	7,490
22	2021	0	528	528	8,018	7,490
23	2022	0	528	528	8,018	7,490
24	2023	0	528	528	8,018	7,490
25	2024	0	528	528	8,018	7,490
26	2025	0	528	528	8,018	7,490
27	2026	0	528	528	8,018	7,490
28	2027	0	528	528	8,018	7,490
29	2028	0	528	528	8,018	7,490
30	2029	0	528	528	8,018	7,490
31	2030	0	528	528	8,018	7,490
32	2031	0	528	528	8,018	7,490
33	2032	0	528	528	8,018	7,490
34	2033	0	528	528	8,018	7,490
35	2034	0	528	528	8,018	7,490
36	2035	0	0	0	0	0
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
	Total	70,995	16,639	87,634	252,673	165,039

EIRR (%) 9.97

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.70	46,661	32,813	-13,848
12	0.86	51,424	44,082	-7,341
10	1.00	55,113	54,965	-148
5	1.58	67,154	106,392	39,238
3	1.98	73,817	146,235	72,418

II-2. Antofagasta

Unit: Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	1,818	0	1,818	0	-1,818
2	2001	28,343	0	28,343	0	-28,343
3	2002	15,775	216	15,991	5,026	-10,965
4	2003	15,301	333	15,637	7,749	-7,888
5	2004	10,581	449	11,030	10,448	-582
6	2005	9,963	528	10,491	12,287	1,796
7	2006	0	607	607	14,125	13,518
8	2007	0	607	607	14,125	13,518
9	2008	0	607	607	14,125	13,518
10	2009	0	607	607	14,125	13,518
11	2010	0	607	607	14,125	13,518
12	2011	0	607	607	14,125	13,518
13	2012	0	607	607	14,125	13,518
14	2013	0	607	607	14,125	13,518
15	2014	0	607	607	14,125	13,518
16	2015	0	607	607	14,125	13,518
17	2016	0	607	607	14,125	13,518
18	2017	0	607	607	14,125	13,518
19	2018	0	607	607	14,125	13,518
20	2019	0	607	607	14,125	13,518
21	2020	0	607	607	14,125	13,518
22	2021	0	607	607	14,125	13,518
23	2022	0	607	607	14,125	13,518
24	2023	0	607	607	14,125	13,518
25	2024	0	607	607	14,125	13,518
26	2025	0	607	607	14,125	13,518
27	2026	0	607	607	14,125	13,518
28	2027	0	607	607	14,125	13,518
29	2028	0	607	607	14,125	13,518
30	2029	0	607	607	14,125	13,518
31	2030	0	607	607	14,125	13,518
32	2031	0	607	607	14,125	13,518
33	2032	0	607	607	14,125	13,518
34	2033	0	607	607	14,125	13,518
35	2034	0	607	607	14,125	13,518
36	2035	0	607	607	14,125	13,518
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
	Total	81,784	19,736	101,520	459,260	357,740

EIRR (%) 16.24

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	1.08	54,210	58,338	4,128
12	1.31	59,589	78,300	18,711
10	1.53	63,772	97,655	33,883
5	2.45	77,551	190,102	112,551
3	3.08	85,273	262,650	177,377

TABLA K.4.5 ANALISIS ECONOMICO DEL PLANO DE ALTERNATIVA-1

II-3. Total of the West Area Project

Unit: Bs.1,000

	Year	Economic Cost			Economic Benefit (B)	(B)-(C)
		Construction	OM	Total (C)		
1	2000	2,853	0	2,853	0	-2,853
2	2001	45,660	0	45,660	0	-45,660
3	2002	33,284	345	33,629	6,985	-26,644
4	2003	35,763	591	36,354	11,667	-24,687
5	2004	25,256	861	26,117	16,705	-9,412
6	2005	9,963	1,056	11,019	20,305	9,286
7	2006	0	1,135	1,135	22,143	21,008
8	2007	0	1,135	1,135	22,143	21,008
9	2008	0	1,135	1,135	22,143	21,008
10	2009	0	1,135	1,135	22,143	21,008
11	2010	0	1,135	1,135	22,143	21,008
12	2011	0	1,135	1,135	22,143	21,008
13	2012	0	1,135	1,135	22,143	21,008
14	2013	0	1,135	1,135	22,143	21,008
15	2014	0	1,135	1,135	22,143	21,008
16	2015	0	1,135	1,135	22,143	21,008
17	2016	0	1,135	1,135	22,143	21,008
18	2017	0	1,135	1,135	22,143	21,008
19	2018	0	1,135	1,135	22,143	21,008
20	2019	0	1,135	1,135	22,143	21,008
21	2020	0	1,135	1,135	22,143	21,008
22	2021	0	1,135	1,135	22,143	21,008
23	2022	0	1,135	1,135	22,143	21,008
24	2023	0	1,135	1,135	22,143	21,008
25	2024	0	1,135	1,135	22,143	21,008
26	2025	0	1,135	1,135	22,143	21,008
27	2026	0	1,135	1,135	22,143	21,008
28	2027	0	1,135	1,135	22,143	21,008
29	2028	0	1,135	1,135	22,143	21,008
30	2029	0	1,135	1,135	22,143	21,008
31	2030	0	1,135	1,135	22,143	21,008
32	2031	0	1,135	1,135	22,143	21,008
33	2032	0	1,135	1,135	22,143	21,008
34	2033	0	1,135	1,135	22,143	21,008
35	2034	0	1,135	1,135	22,143	21,008
36	2035	0	607	607	14,125	13,518
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
	Total	152,779	36,375	189,154	711,934	522,780

EIRR (%) 13.41

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.90	100,871	91,151	-9,720
12	1.10	111,012	122,382	11,370
10	1.28	118,884	152,620	33,735
5	2.05	141,705	296,494	151,789
3	2.57	159,090	408,885	249,795

III. Total of the Whole Project

Unit: RM 1,000

	Year	Economic Cost			Economic Benefit (B)	(B)-(C)
		Construction	OM	Total (C)		
1	2000	9,446	0	9,446	0	-9,446
2	2001	158,033	0	158,033	0	-158,033
3	2002	162,742	1,174	163,916	19,684	-144,232
4	2003	159,519	2,387	161,906	39,598	-122,308
5	2004	179,541	3,564	183,105	58,792	-124,313
6	2005	170,808	4,897	175,705	81,560	-94,145
7	2006	16,380	6,242	22,622	105,383	82,761
8	2007	16,380	6,363	22,743	108,053	85,310
9	2008	15,422	6,485	21,907	110,746	88,839
10	2009	0	6,607	6,607	113,438	106,831
11	2010	0	6,607	6,607	113,438	106,831
12	2011	0	6,607	6,607	113,438	106,831
13	2012	0	6,607	6,607	113,438	106,831
14	2013	0	6,607	6,607	113,438	106,831
15	2014	0	6,607	6,607	113,438	106,831
16	2015	0	6,607	6,607	113,438	106,831
17	2016	0	6,607	6,607	113,438	106,831
18	2017	0	6,607	6,607	113,438	106,831
19	2018	0	6,607	6,607	113,438	106,831
20	2019	0	6,607	6,607	113,438	106,831
21	2020	0	6,607	6,607	113,438	106,831
22	2021	0	6,607	6,607	113,438	106,831
23	2022	0	6,607	6,607	113,438	106,831
24	2023	0	6,607	6,607	113,438	106,831
25	2024	0	6,607	6,607	113,438	106,831
26	2025	0	6,607	6,607	113,438	106,831
27	2026	0	6,607	6,607	113,438	106,831
28	2027	0	6,607	6,607	113,438	106,831
29	2028	0	6,607	6,607	113,438	106,831
30	2029	0	6,607	6,607	113,438	106,831
31	2030	0	6,607	6,607	113,438	106,831
32	2031	0	6,607	6,607	113,438	106,831
33	2032	0	6,607	6,607	113,438	106,831
34	2033	0	6,607	6,607	113,438	106,831
35	2034	0	6,607	6,607	113,438	106,831
36	2035	0	6,079	6,079	105,420	99,341
37	2036	0	1,318	1,318	29,087	27,769
38	2037	0	1,318	1,318	29,087	27,769
39	2038	0	1,318	1,318	29,087	27,769
	Total	888,271	212,927	1,101,198	3,665,884	2,564,686

EIRR (%) 11.48

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.79	529,471	416,912	-112,559
12	0.96	593,186	571,054	-22,132
10	1.12	643,285	722,303	79,018
5	1.80	810,199	1,458,960	648,760
3	2.26	904,132	2,047,064	1,142,932

TABLA K.4.6 ANALISIS ECONOMICO DEL PLANO DE ALTERNATIVA-2

I-1. Rio Pallon

Unit: Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	2,495	0	2,495	0	-2,495
2	2001	42,760	0	42,760	0	-42,760
3	2002	42,760	318	43,078	6,575	-36,503
4	2003	43,426	637	44,063	13,171	-30,892
5	2004	53,592	955	54,547	19,747	-34,800
6	2005	51,762	1,353	53,115	27,976	-25,139
7	2006	0	1,763	1,763	36,454	34,691
8	2007	0	1,763	1,763	36,454	34,691
9	2008	0	1,763	1,763	36,454	34,691
10	2009	0	1,763	1,763	36,454	34,691
11	2010	0	1,763	1,763	36,454	34,691
12	2011	0	1,763	1,763	36,454	34,691
13	2012	0	1,763	1,763	36,454	34,691
14	2013	0	1,763	1,763	36,454	34,691
15	2014	0	1,763	1,763	36,454	34,691
16	2015	0	1,763	1,763	36,454	34,691
17	2016	0	1,763	1,763	36,454	34,691
18	2017	0	1,763	1,763	36,454	34,691
19	2018	0	1,763	1,763	36,454	34,691
20	2019	0	1,763	1,763	36,454	34,691
21	2020	0	1,763	1,763	36,454	34,691
22	2021	0	1,763	1,763	36,454	34,691
23	2022	0	1,763	1,763	36,454	34,691
24	2023	0	1,763	1,763	36,454	34,691
25	2024	0	1,763	1,763	36,454	34,691
26	2025	0	1,763	1,763	36,454	34,691
27	2026	0	1,763	1,763	36,454	34,691
28	2027	0	1,763	1,763	36,454	34,691
29	2028	0	1,763	1,763	36,454	34,691
30	2029	0	1,763	1,763	36,454	34,691
31	2030	0	1,763	1,763	36,454	34,691
32	2031	0	1,763	1,763	36,454	34,691
33	2032	0	1,763	1,763	36,454	34,691
34	2033	0	1,763	1,763	36,454	34,691
35	2034	0	1,763	1,763	36,454	34,691
36	2035	0	1,763	1,763	36,454	34,691
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
	Total	236,795	56,153	292,948	1,161,090	868,142

EIRR (%) 14.33

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.96	143,107	137,247	-5,860
12	1.17	160,037	187,198	27,162
10	1.36	173,301	235,970	62,670
5	2.17	217,222	471,034	253,813
3	2.72	241,775	656,578	414,803

I-2.Quebrada Chane

Unit: Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	359	0	359	0	-359
2	2001	6,811	0	6,811	0	-6,811
3	2002	24,424	43	24,467	790	-23,677
4	2003	24,425	224	24,649	4,115	-20,534
5	2004	24,358	406	24,764	7,458	-17,306
6	2005	21,814	587	22,401	10,782	-11,619
7	2006	0	760	760	13,960	13,200
8	2007	0	760	760	13,960	13,200
9	2008	0	760	760	13,960	13,200
10	2009	0	760	760	13,960	13,200
11	2010	0	760	760	13,960	13,200
12	2011	0	760	760	13,960	13,200
13	2012	0	760	760	13,960	13,200
14	2013	0	760	760	13,960	13,200
15	2014	0	760	760	13,960	13,200
16	2015	0	760	760	13,960	13,200
17	2016	0	760	760	13,960	13,200
18	2017	0	760	760	13,960	13,200
19	2018	0	760	760	13,960	13,200
20	2019	0	760	760	13,960	13,200
21	2020	0	760	760	13,960	13,200
22	2021	0	760	760	13,960	13,200
23	2022	0	760	760	13,960	13,200
24	2023	0	760	760	13,960	13,200
25	2024	0	760	760	13,960	13,200
26	2025	0	760	760	13,960	13,200
27	2026	0	760	760	13,960	13,200
28	2027	0	760	760	13,960	13,200
29	2028	0	760	760	13,960	13,200
30	2029	0	760	760	13,960	13,200
31	2030	0	760	760	13,960	13,200
32	2031	0	760	760	13,960	13,200
33	2032	0	760	760	13,960	13,200
34	2033	0	760	760	13,960	13,200
35	2034	0	760	760	13,960	13,200
36	2035	0	760	760	13,960	13,200
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
	Total	102,191	24,060	126,251	441,941	315,693

EIRR (%) 12.52

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.85	59,797	50,869	-8,928
12	1.04	67,333	69,842	2,510
10	1.21	73,239	88,405	15,166
5	1.92	92,771	178,094	85,323
3	2.40	103,657	248,996	145,338

TABLA K.4.7 ANALISIS ECONOMICO DEL PLANO DE ALTERNATIVA-2

I-3. Chane Chacras

Unit: Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	852	0	852	0	-852
2	2001	14,076	0	14,076	0	-14,076
3	2002	14,076	105	14,181	2,317	-11,864
4	2003	15,355	209	15,564	4,612	-10,952
5	2004	35,783	314	36,097	6,930	-29,167
6	2005	49,077	572	49,649	12,623	-37,026
7	2006	16,380	953	17,333	21,032	3,699
8	2007	16,380	1,074	17,454	23,702	6,248
9	2008	15,422	1,196	16,618	26,395	9,777
10	2009	0	1,318	1,318	29,087	27,769
11	2010	0	1,318	1,318	29,087	27,769
12	2011	0	1,318	1,318	29,087	27,769
13	2012	0	1,318	1,318	29,087	27,769
14	2013	0	1,318	1,318	29,087	27,769
15	2014	0	1,318	1,318	29,087	27,769
16	2015	0	1,318	1,318	29,087	27,769
17	2016	0	1,318	1,318	29,087	27,769
18	2017	0	1,318	1,318	29,087	27,769
19	2018	0	1,318	1,318	29,087	27,769
20	2019	0	1,318	1,318	29,087	27,769
21	2020	0	1,318	1,318	29,087	27,769
22	2021	0	1,318	1,318	29,087	27,769
23	2022	0	1,318	1,318	29,087	27,769
24	2023	0	1,318	1,318	29,087	27,769
25	2024	0	1,318	1,318	29,087	27,769
26	2025	0	1,318	1,318	29,087	27,769
27	2026	0	1,318	1,318	29,087	27,769
28	2027	0	1,318	1,318	29,087	27,769
29	2028	0	1,318	1,318	29,087	27,769
30	2029	0	1,318	1,318	29,087	27,769
31	2030	0	1,318	1,318	29,087	27,769
32	2031	0	1,318	1,318	29,087	27,769
33	2032	0	1,318	1,318	29,087	27,769
34	2033	0	1,318	1,318	29,087	27,769
35	2034	0	1,318	1,318	29,087	27,769
36	2035	0	1,318	1,318	29,087	27,769
37	2036	0	1,318	1,318	29,087	27,769
38	2037	0	1,318	1,318	29,087	27,769
39	2038	0	1,318	1,318	29,087	27,769
	Total	177,401	43,963	221,364	970,221	748,857

EIRR (%) 15.38

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	1.02	88,424	90,511	2,087
12	1.25	102,314	128,004	25,690
10	1.46	113,485	165,651	52,166
5	2.35	151,869	356,879	205,009
3	2.96	174,026	515,757	341,731

I-4. Okinawa Drainage

Unit: Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	1,210	0	1,210	0	-1,210
2	2001	19,894	0	19,894	0	-19,894
3	2002	19,366	148	19,514	2,657	-16,857
4	2003	11,718	296	12,014	5,314	-6,700
5	2004	11,720	383	12,103	6,876	-5,227
6	2005	11,037	470	11,507	8,438	-3,069
7	2006	0	557	557	10,000	9,443
8	2007	0	557	557	10,000	9,443
9	2008	0	557	557	10,000	9,443
10	2009	0	557	557	10,000	9,443
11	2010	0	557	557	10,000	9,443
12	2011	0	557	557	10,000	9,443
13	2012	0	557	557	10,000	9,443
14	2013	0	557	557	10,000	9,443
15	2014	0	557	557	10,000	9,443
16	2015	0	557	557	10,000	9,443
17	2016	0	557	557	10,000	9,443
18	2017	0	557	557	10,000	9,443
19	2018	0	557	557	10,000	9,443
20	2019	0	557	557	10,000	9,443
21	2020	0	557	557	10,000	9,443
22	2021	0	557	557	10,000	9,443
23	2022	0	557	557	10,000	9,443
24	2023	0	557	557	10,000	9,443
25	2024	0	557	557	10,000	9,443
26	2025	0	557	557	10,000	9,443
27	2026	0	557	557	10,000	9,443
28	2027	0	557	557	10,000	9,443
29	2028	0	557	557	10,000	9,443
30	2029	0	557	557	10,000	9,443
31	2030	0	557	557	10,000	9,443
32	2031	0	557	557	10,000	9,443
33	2032	0	557	557	10,000	9,443
34	2033	0	557	557	10,000	9,443
35	2034	0	557	557	10,000	9,443
36	2035	0	557	557	10,000	9,443
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
	Total	74,945	18,007	92,952	323,285	230,333

EIRR (%) 12.21

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.83	48,368	40,239	-8,129
12	1.02	53,435	54,255	820
10	1.18	57,383	67,871	10,488
5	1.89	70,397	133,063	62,666
3	2.37	77,679	181,302	106,623

TABLA K.4.8 ANALISIS ECONOMICO DEL PLANO DE ALTERNATIVA-2

I-5.Total of The East Area Project

Unit: Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	4,916	0	4,916	0	-4,916
2	2001	83,541	0	83,541	0	-83,541
3	2002	100,626	614	101,240	12,340	-88,900
4	2003	94,924	1,366	96,290	27,213	-69,077
5	2004	125,453	2,058	127,511	41,010	-86,501
6	2005	133,690	2,982	136,672	59,820	-76,852
7	2006	16,380	4,033	20,413	81,446	61,033
8	2007	16,380	4,154	20,534	84,116	63,582
9	2008	15,422	4,276	19,698	86,809	67,111
10	2009	0	4,398	4,398	89,501	85,103
11	2010	0	4,398	4,398	89,501	85,103
12	2011	0	4,398	4,398	89,501	85,103
13	2012	0	4,398	4,398	89,501	85,103
14	2013	0	4,398	4,398	89,501	85,103
15	2014	0	4,398	4,398	89,501	85,103
16	2015	0	4,398	4,398	89,501	85,103
17	2016	0	4,398	4,398	89,501	85,103
18	2017	0	4,398	4,398	89,501	85,103
19	2018	0	4,398	4,398	89,501	85,103
20	2019	0	4,398	4,398	89,501	85,103
21	2020	0	4,398	4,398	89,501	85,103
22	2021	0	4,398	4,398	89,501	85,103
23	2022	0	4,398	4,398	89,501	85,103
24	2023	0	4,398	4,398	89,501	85,103
25	2024	0	4,398	4,398	89,501	85,103
26	2025	0	4,398	4,398	89,501	85,103
27	2026	0	4,398	4,398	89,501	85,103
28	2027	0	4,398	4,398	89,501	85,103
29	2028	0	4,398	4,398	89,501	85,103
30	2029	0	4,398	4,398	89,501	85,103
31	2030	0	4,398	4,398	89,501	85,103
32	2031	0	4,398	4,398	89,501	85,103
33	2032	0	4,398	4,398	89,501	85,103
34	2033	0	4,398	4,398	89,501	85,103
35	2034	0	4,398	4,398	89,501	85,103
36	2035	0	4,398	4,398	89,501	85,103
37	2036	0	1,318	1,318	29,087	27,769
38	2037	0	1,318	1,318	29,087	27,769
39	2038	0	1,318	1,318	29,087	27,769
	Total	591,332	142,183	733,515	2,896,541	2,163,026

EIRR (%) 14.00

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.94	339,696	318,866	-20,831
12	1.15	383,118	439,300	56,182
10	1.34	417,407	557,898	140,491
5	2.14	532,259	1,139,070	606,811
3	2.69	597,138	1,605,633	1,008,495

TABLA K.4.9 ANALISIS ECONOMICO DEL PLANO DE ALTERNATIVA-2

II-1. San Juan

Unit : Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	1,312	0	1,312	0	-1,312
2	2001	22,194	0	22,194	0	-22,194
3	2002	22,092	165	22,257	2,209	-20,048
4	2003	20,152	330	20,482	4,417	-16,065
5	2004	14,674	483	15,157	6,465	-8,692
6	2005	0	599	599	8,018	7,419
7	2006	0	599	599	8,018	7,419
8	2007	0	599	599	8,018	7,419
9	2008	0	599	599	8,018	7,419
10	2009	0	599	599	8,018	7,419
11	2010	0	599	599	8,018	7,419
12	2011	0	599	599	8,018	7,419
13	2012	0	599	599	8,018	7,419
14	2013	0	599	599	8,018	7,419
15	2014	0	599	599	8,018	7,419
16	2015	0	599	599	8,018	7,419
17	2016	0	599	599	8,018	7,419
18	2017	0	599	599	8,018	7,419
19	2018	0	599	599	8,018	7,419
20	2019	0	599	599	8,018	7,419
21	2020	0	599	599	8,018	7,419
22	2021	0	599	599	8,018	7,419
23	2022	0	599	599	8,018	7,419
24	2023	0	599	599	8,018	7,419
25	2024	0	599	599	8,018	7,419
26	2025	0	599	599	8,018	7,419
27	2026	0	599	599	8,018	7,419
28	2027	0	599	599	8,018	7,419
29	2028	0	599	599	8,018	7,419
30	2029	0	599	599	8,018	7,419
31	2030	0	599	599	8,018	7,419
32	2031	0	599	599	8,018	7,419
33	2032	0	599	599	8,018	7,419
34	2033	0	599	599	8,018	7,419
35	2034	0	599	599	8,018	7,419
36	2035	0	0	0	0	0
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
	Total	80,424	18,948	99,372	253,631	154,259

EIRR (%) 8.48

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.62	53,759	33,367	-20,392
12	0.76	59,061	44,696	-14,366
10	0.88	63,164	55,623	-7,541
5	1.40	76,548	107,182	30,634
3	1.75	83,962	147,087	63,125

II-2. Antofagasta

Unit : Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	1,818	0	1,818	0	-1,818
2	2001	28,343	0	28,343	0	-28,343
3	2002	15,775	216	15,991	5,026	-10,965
4	2003	15,304	333	15,637	7,749	-7,888
5	2004	10,581	449	11,030	10,448	-582
6	2005	9,963	528	10,491	12,287	1,796
7	2006	0	607	607	14,125	13,518
8	2007	0	607	607	14,125	13,518
9	2008	0	607	607	14,125	13,518
10	2009	0	607	607	14,125	13,518
11	2010	0	607	607	14,125	13,518
12	2011	0	607	607	14,125	13,518
13	2012	0	607	607	14,125	13,518
14	2013	0	607	607	14,125	13,518
15	2014	0	607	607	14,125	13,518
16	2015	0	607	607	14,125	13,518
17	2016	0	607	607	14,125	13,518
18	2017	0	607	607	14,125	13,518
19	2018	0	607	607	14,125	13,518
20	2019	0	607	607	14,125	13,518
21	2020	0	607	607	14,125	13,518
22	2021	0	607	607	14,125	13,518
23	2022	0	607	607	14,125	13,518
24	2023	0	607	607	14,125	13,518
25	2024	0	607	607	14,125	13,518
26	2025	0	607	607	14,125	13,518
27	2026	0	607	607	14,125	13,518
28	2027	0	607	607	14,125	13,518
29	2028	0	607	607	14,125	13,518
30	2029	0	607	607	14,125	13,518
31	2030	0	607	607	14,125	13,518
32	2031	0	607	607	14,125	13,518
33	2032	0	607	607	14,125	13,518
34	2033	0	607	607	14,125	13,518
35	2034	0	607	607	14,125	13,518
36	2035	0	607	607	14,125	13,518
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
	Total	81,784	19,736	101,520	459,260	357,740

EIRR (%) 16.24

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	1.08	54,210	58,338	4,128
12	1.31	59,589	78,300	18,711
10	1.53	63,772	97,655	33,883
5	2.45	77,551	190,102	112,551
3	3.08	85,273	262,650	177,377

TABLA K.4.10 ANALISIS ECONOMICO DEL PLANO DE ALTERNATIVA-2

II-3. Total of the West Area Project

Unit: Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	3,130	0	3,130	0	-3,130
2	2001	50,537	0	50,537	0	-50,537
3	2002	37,867	381	38,248	7,235	-31,013
4	2003	35,456	663	36,119	12,166	-23,953
5	2004	25,255	932	26,187	16,914	-9,273
6	2005	9,963	1,127	11,090	20,305	9,215
7	2006	0	1,206	1,206	22,143	20,937
8	2007	0	1,206	1,206	22,143	20,937
9	2008	0	1,206	1,206	22,143	20,937
10	2009	0	1,206	1,206	22,143	20,937
11	2010	0	1,206	1,206	22,143	20,937
12	2011	0	1,206	1,206	22,143	20,937
13	2012	0	1,206	1,206	22,143	20,937
14	2013	0	1,206	1,206	22,143	20,937
15	2014	0	1,206	1,206	22,143	20,937
16	2015	0	1,206	1,206	22,143	20,937
17	2016	0	1,206	1,206	22,143	20,937
18	2017	0	1,206	1,206	22,143	20,937
19	2018	0	1,206	1,206	22,143	20,937
20	2019	0	1,206	1,206	22,143	20,937
21	2020	0	1,206	1,206	22,143	20,937
22	2021	0	1,206	1,206	22,143	20,937
23	2022	0	1,206	1,206	22,143	20,937
24	2023	0	1,206	1,206	22,143	20,937
25	2024	0	1,206	1,206	22,143	20,937
26	2025	0	1,206	1,206	22,143	20,937
27	2026	0	1,206	1,206	22,143	20,937
28	2027	0	1,206	1,206	22,143	20,937
29	2028	0	1,206	1,206	22,143	20,937
30	2029	0	1,206	1,206	22,143	20,937
31	2030	0	1,206	1,206	22,143	20,937
32	2031	0	1,206	1,206	22,143	20,937
33	2032	0	1,206	1,206	22,143	20,937
34	2033	0	1,206	1,206	22,143	20,937
35	2034	0	1,206	1,206	22,143	20,937
36	2035	0	607	607	14,125	13,518
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
	Total	162,208	38,684	200,892	712,891	511,999

EIRR (%) 12.51

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.85	107,958	91,701	-16,264
12	1.04	118,650	122,996	4,346
10	1.21	126,936	153,278	26,342
5	1.93	154,029	297,284	143,185
3	2.42	169,235	409,737	240,502

III. Total of the Whole Project

Unit: RM1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	8,046	0	8,046	0	-8,046
2	2001	134,078	0	134,078	0	-134,078
3	2002	138,493	995	139,488	19,575	-119,913
4	2003	130,380	2,029	132,409	39,379	-93,030
5	2004	150,708	2,990	153,698	57,924	-95,774
6	2005	143,653	4,109	147,762	80,125	-67,637
7	2006	16,380	5,239	21,619	103,589	81,970
8	2007	16,380	5,360	21,740	106,259	84,519
9	2008	15,422	5,482	20,904	108,952	88,048
10	2009	0	5,604	5,604	111,644	106,040
11	2010	0	5,604	5,604	111,644	106,040
12	2011	0	5,604	5,604	111,644	106,040
13	2012	0	5,604	5,604	111,644	106,040
14	2013	0	5,604	5,604	111,644	106,040
15	2014	0	5,604	5,604	111,644	106,040
16	2015	0	5,604	5,604	111,644	106,040
17	2016	0	5,604	5,604	111,644	106,040
18	2017	0	5,604	5,604	111,644	106,040
19	2018	0	5,604	5,604	111,644	106,040
20	2019	0	5,604	5,604	111,644	106,040
21	2020	0	5,604	5,604	111,644	106,040
22	2021	0	5,604	5,604	111,644	106,040
23	2022	0	5,604	5,604	111,644	106,040
24	2023	0	5,604	5,604	111,644	106,040
25	2024	0	5,604	5,604	111,644	106,040
26	2025	0	5,604	5,604	111,644	106,040
27	2026	0	5,604	5,604	111,644	106,040
28	2027	0	5,604	5,604	111,644	106,040
29	2028	0	5,604	5,604	111,644	106,040
30	2029	0	5,604	5,604	111,644	106,040
31	2030	0	5,604	5,604	111,644	106,040
32	2031	0	5,604	5,604	111,644	106,040
33	2032	0	5,604	5,604	111,644	106,040
34	2033	0	5,604	5,604	111,644	106,040
35	2034	0	5,604	5,604	111,644	106,040
36	2035	0	5,005	5,005	103,626	98,621
37	2036	0	1,318	1,318	29,087	27,769
38	2037	0	1,318	1,318	29,087	27,769
39	2038	0	1,318	1,318	29,087	27,769
	Total	753,540	180,867	934,407	3,609,432	2,675,025

EIRR (%) 13.61

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.92	447,665	410,570	-37,095
12	1.12	501,769	562,296	60,528
10	1.31	544,343	711,176	166,833
5	2.09	686,359	1,436,355	749,996
3	2.63	766,373	2,015,370	1,248,997

TABLA K.4.11 ANALISIS ECONOMICO DEL PLANO DE ALTERNATIVA-1 (PERIODO DE LA CONSTRUCCION)

I-1. Rio Chane

Unit: Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	1,677	0	1,677	0	-1,677
2	2001	28,832	0	28,832	0	-28,832
3	2002	28,832	215	29,047	359	-28,688
4	2003	28,832	430	29,262	718	-28,544
5	2004	28,832	645	29,477	1,077	-28,400
6	2005	27,155	859	28,014	1,435	-26,579
7	2006	0	1,074	1,074	1,794	720
8	2007	0	1,074	1,074	1,794	720
9	2008	0	1,074	1,074	1,794	720
10	2009	0	1,074	1,074	1,794	720
11	2010	0	1,074	1,074	1,794	720
12	2011	0	1,074	1,074	1,794	720
13	2012	0	1,074	1,074	1,794	720
14	2013	0	1,074	1,074	1,794	720
15	2014	0	1,074	1,074	1,794	720
16	2015	0	1,074	1,074	1,794	720
17	2016	0	1,074	1,074	1,794	720
18	2017	0	1,074	1,074	1,794	720
19	2018	0	1,074	1,074	1,794	720
20	2019	0	1,074	1,074	1,794	720
21	2020	0	1,074	1,074	1,794	720
22	2021	0	1,074	1,074	1,794	720
23	2022	0	1,074	1,074	1,794	720
24	2023	0	1,074	1,074	1,794	720
25	2024	0	1,074	1,074	1,794	720
26	2025	0	1,074	1,074	1,794	720
27	2026	0	1,074	1,074	1,794	720
28	2027	0	1,074	1,074	1,794	720
29	2028	0	1,074	1,074	1,794	720
30	2029	0	1,074	1,074	1,794	720
31	2030	0	1,074	1,074	1,794	720
32	2031	0	1,074	1,074	1,794	720
33	2032	0	1,074	1,074	1,794	720
34	2033	0	1,074	1,074	1,794	720
35	2034	0	1,074	1,074	1,794	720
36	2035	0	1,074	1,074	1,794	720
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
40	2039	0	0	0	0	0
41	2040	0	0	0	0	0
	Total	141,160	34,369	178,529	57,410	-121,119

EIRR (%) #DIV/0!

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.08	88,904	6,895	-82,009
12	0.09	99,055	9,372	-89,684
10	0.11	106,994	11,786	-95,208
5	0.18	133,235	23,395	-109,840
3	0.22	147,904	32,547	-115,358

I-2. Rio Pailon

Unit: Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	0	0	0	0	0
2	2001	0	0	0	0	0
3	2002	0	0	0	0	0
4	2003	0	0	0	0	0
5	2004	0	0	0	0	0
6	2005	2,495	0	2,495	0	-2,495
7	2006	42,760	0	42,760	0	-42,760
8	2007	42,760	318	43,078	6,575	-36,503
9	2008	43,426	637	44,063	13,171	-30,892
10	2009	53,592	955	54,547	19,747	-34,800
11	2010	51,762	1,353	53,115	27,976	-25,139
12	2011	0	1,763	1,763	36,454	34,691
13	2012	0	1,763	1,763	36,454	34,691
14	2013	0	1,763	1,763	36,454	34,691
15	2014	0	1,763	1,763	36,454	34,691
16	2015	0	1,763	1,763	36,454	34,691
17	2016	0	1,763	1,763	36,454	34,691
18	2017	0	1,763	1,763	36,454	34,691
19	2018	0	1,763	1,763	36,454	34,691
20	2019	0	1,763	1,763	36,454	34,691
21	2020	0	1,763	1,763	36,454	34,691
22	2021	0	1,763	1,763	36,454	34,691
23	2022	0	1,763	1,763	36,454	34,691
24	2023	0	1,763	1,763	36,454	34,691
25	2024	0	1,763	1,763	36,454	34,691
26	2025	0	1,763	1,763	36,454	34,691
27	2026	0	1,763	1,763	36,454	34,691
28	2027	0	1,763	1,763	36,454	34,691
29	2028	0	1,763	1,763	36,454	34,691
30	2029	0	1,763	1,763	36,454	34,691
31	2030	0	1,763	1,763	36,454	34,691
32	2031	0	1,763	1,763	36,454	34,691
33	2032	0	1,763	1,763	36,454	34,691
34	2033	0	1,763	1,763	36,454	34,691
35	2034	0	1,763	1,763	36,454	34,691
36	2035	0	1,763	1,763	36,454	34,691
37	2036	0	1,763	1,763	36,454	34,691
38	2037	0	1,763	1,763	36,454	34,691
39	2038	0	1,763	1,763	36,454	34,691
40	2039	0	1,763	1,763	36,454	34,691
41	2040	0	1,763	1,763	36,454	34,691
	Total	236,795	56,153	292,948	1,161,090	868,142

EIRR (%) 14.33

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.96	71,149	68,236	-2,913
12	1.17	90,809	106,221	15,412
10	1.36	107,606	146,519	38,913
5	2.17	170,199	369,068	198,869
3	2.72	208,557	566,370	357,813

TABLA K.4.12 ANALISIS ECONOMICO DEL PLANO DE ALTERNATIVA-1 (PERIODO DE LA CONSTRUCCION)

I-3. Quebrada Chane

Unit: Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	0	0	0	0	0
2	2001	0	0	0	0	0
3	2002	0	0	0	0	0
4	2003	0	0	0	0	0
5	2004	0	0	0	0	0
6	2005	359	0	359	0	-359
7	2006	6,811	0	6,811	0	-6,811
8	2007	24,424	43	24,467	790	-23,677
9	2008	24,425	224	24,649	4,115	-20,534
10	2009	24,358	406	24,764	7,458	-17,306
11	2010	21,814	587	22,401	10,782	-11,619
12	2011	0	760	760	13,960	13,200
13	2012	0	760	760	13,960	13,200
14	2013	0	760	760	13,960	13,200
15	2014	0	760	760	13,960	13,200
16	2015	0	760	760	13,960	13,200
17	2016	0	760	760	13,960	13,200
18	2017	0	760	760	13,960	13,200
19	2018	0	760	760	13,960	13,200
20	2019	0	760	760	13,960	13,200
21	2020	0	760	760	13,960	13,200
22	2021	0	760	760	13,960	13,200
23	2022	0	760	760	13,960	13,200
24	2023	0	760	760	13,960	13,200
25	2024	0	760	760	13,960	13,200
26	2025	0	760	760	13,960	13,200
27	2026	0	760	760	13,960	13,200
28	2027	0	760	760	13,960	13,200
29	2028	0	760	760	13,960	13,200
30	2029	0	760	760	13,960	13,200
31	2030	0	760	760	13,960	13,200
32	2031	0	760	760	13,960	13,200
33	2032	0	760	760	13,960	13,200
34	2033	0	760	760	13,960	13,200
35	2034	0	760	760	13,960	13,200
36	2035	0	760	760	13,960	13,200
37	2036	0	760	760	13,960	13,200
38	2037	0	760	760	13,960	13,200
39	2038	0	760	760	13,960	13,200
40	2039	0	760	760	13,960	13,200
41	2040	0	760	760	13,960	13,200
	Total	102,191	24,060	126,251	441,944	315,693

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
			EIRR (%)	12.52
15	0.85	29,730	25,291	-4,439
12	1.04	38,206	39,630	1,424
10	1.21	45,475	54,893	9,417
5	1.92	72,689	139,541	66,852
3	2.40	89,416	214,786	125,370

I-4. Chane Chacras

Unit: Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	0	0	0	0	0
2	2001	0	0	0	0	0
3	2002	852	0	852	0	-852
4	2003	14,076	0	14,076	0	-14,076
5	2004	14,076	105	14,181	2,317	-11,864
6	2005	15,355	209	15,564	4,612	-10,952
7	2006	35,783	314	36,097	6,930	-29,167
8	2007	49,077	572	49,649	12,623	-37,026
9	2008	16,380	953	17,333	21,032	3,699
10	2009	16,380	1,074	17,454	23,702	6,248
11	2010	15,422	1,196	16,618	26,395	9,777
12	2011	0	1,318	1,318	29,087	27,769
13	2012	0	1,318	1,318	29,087	27,769
14	2013	0	1,318	1,318	29,087	27,769
15	2014	0	1,318	1,318	29,087	27,769
16	2015	0	1,318	1,318	29,087	27,769
17	2016	0	1,318	1,318	29,087	27,769
18	2017	0	1,318	1,318	29,087	27,769
19	2018	0	1,318	1,318	29,087	27,769
20	2019	0	1,318	1,318	29,087	27,769
21	2020	0	1,318	1,318	29,087	27,769
22	2021	0	1,318	1,318	29,087	27,769
23	2022	0	1,318	1,318	29,087	27,769
24	2023	0	1,318	1,318	29,087	27,769
25	2024	0	1,318	1,318	29,087	27,769
26	2025	0	1,318	1,318	29,087	27,769
27	2026	0	1,318	1,318	29,087	27,769
28	2027	0	1,318	1,318	29,087	27,769
29	2028	0	1,318	1,318	29,087	27,769
30	2029	0	1,318	1,318	29,087	27,769
31	2030	0	1,318	1,318	29,087	27,769
32	2031	0	1,318	1,318	29,087	27,769
33	2032	0	1,318	1,318	29,087	27,769
34	2033	0	1,318	1,318	29,087	27,769
35	2034	0	1,318	1,318	29,087	27,769
36	2035	0	1,318	1,318	29,087	27,769
37	2036	0	1,318	1,318	29,087	27,769
38	2037	0	1,318	1,318	29,087	27,769
39	2038	0	1,318	1,318	29,087	27,769
40	2039	0	1,318	1,318	29,087	27,769
41	2040	0	1,318	1,318	29,087	27,769
	Total	177,401	43,963	221,364	970,221	748,857

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
			EIRR (%)	15.38
15	1.02	66,861	68,439	1,578
12	1.25	81,564	102,044	20,480
10	1.46	93,790	136,902	43,112
5	2.35	137,750	323,700	185,950
3	2.96	164,036	486,150	322,114

TABLA K.4.13 ANALISIS ECONOMICO DEL PLANO DE ALTERNATIVA-1 (PERIODO DE LA CONSTRUCCION)

I-5. Okinawa Drainage

Unit: Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	1,210	0	1,210	0	-1,210
2	2001	19,894	0	19,894	0	-19,894
3	2002	19,366	148	19,514	2,657	-16,857
4	2003	11,718	296	12,014	5,314	-6,700
5	2004	11,720	383	12,103	6,876	-5,227
6	2005	11,037	470	11,507	8,438	-3,069
7	2006	0	557	557	10,000	9,443
8	2007	0	557	557	10,000	9,443
9	2008	0	557	557	10,000	9,443
10	2009	0	557	557	10,000	9,443
11	2010	0	557	557	10,000	9,443
12	2011	0	557	557	10,000	9,443
13	2012	0	557	557	10,000	9,443
14	2013	0	557	557	10,000	9,443
15	2014	0	557	557	10,000	9,443
16	2015	0	557	557	10,000	9,443
17	2016	0	557	557	10,000	9,443
18	2017	0	557	557	10,000	9,443
19	2018	0	557	557	10,000	9,443
20	2019	0	557	557	10,000	9,443
21	2020	0	557	557	10,000	9,443
22	2021	0	557	557	10,000	9,443
23	2022	0	557	557	10,000	9,443
24	2023	0	557	557	10,000	9,443
25	2024	0	557	557	10,000	9,443
26	2025	0	557	557	10,000	9,443
27	2026	0	557	557	10,000	9,443
28	2027	0	557	557	10,000	9,443
29	2028	0	557	557	10,000	9,443
30	2029	0	557	557	10,000	9,443
31	2030	0	557	557	10,000	9,443
32	2031	0	557	557	10,000	9,443
33	2032	0	557	557	10,000	9,443
34	2033	0	557	557	10,000	9,443
35	2034	0	557	557	10,000	9,443
36	2035	0	557	557	10,000	9,443
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
40	2039	0	0	0	0	0
41	2040	0	0	0	0	0
	Total	74,945	18,007	92,952	323,285	230,333

EIRR (%) 12.21

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	Benefit	NPV (Bs. 1,000)
15	0.83	48,368	40,239	-8,129
12	1.02	53,435	54,255	820
10	1.18	57,383	67,871	10,488
5	1.89	70,397	133,063	62,666
3	2.37	77,679	184,302	106,623

I-6. Total of The East Area Project

Unit: Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	2,887	0	2,887	0	-2,887
2	2001	48,726	0	48,726	0	-48,726
3	2002	49,050	363	49,413	3,016	-46,397
4	2003	54,626	726	55,352	6,032	-49,320
5	2004	54,628	1,133	55,761	10,271	-45,490
6	2005	56,401	1,538	57,939	14,485	-43,454
7	2006	85,354	1,945	87,299	18,724	-68,575
8	2007	116,261	2,564	118,825	31,783	-87,042
9	2008	84,231	3,445	87,676	50,112	-37,564
10	2009	94,330	4,066	98,396	62,701	-35,695
11	2010	88,998	4,767	93,765	76,947	-16,818
12	2011	0	5,472	5,472	91,295	85,823
13	2012	0	5,472	5,472	91,295	85,823
14	2013	0	5,472	5,472	91,295	85,823
15	2014	0	5,472	5,472	91,295	85,823
16	2015	0	5,472	5,472	91,295	85,823
17	2016	0	5,472	5,472	91,295	85,823
18	2017	0	5,472	5,472	91,295	85,823
19	2018	0	5,472	5,472	91,295	85,823
20	2019	0	5,472	5,472	91,295	85,823
21	2020	0	5,472	5,472	91,295	85,823
22	2021	0	5,472	5,472	91,295	85,823
23	2022	0	5,472	5,472	91,295	85,823
24	2023	0	5,472	5,472	91,295	85,823
25	2024	0	5,472	5,472	91,295	85,823
26	2025	0	5,472	5,472	91,295	85,823
27	2026	0	5,472	5,472	91,295	85,823
28	2027	0	5,472	5,472	91,295	85,823
29	2028	0	5,472	5,472	91,295	85,823
30	2029	0	5,472	5,472	91,295	85,823
31	2030	0	5,472	5,472	91,295	85,823
32	2031	0	5,472	5,472	91,295	85,823
33	2032	0	5,472	5,472	91,295	85,823
34	2033	0	5,472	5,472	91,295	85,823
35	2034	0	5,472	5,472	91,295	85,823
36	2035	0	5,472	5,472	91,295	85,823
37	2036	0	3,841	3,841	79,501	75,660
38	2037	0	3,841	3,841	79,501	75,660
39	2038	0	3,841	3,841	79,501	75,660
40	2039	0	3,841	3,841	79,501	75,660
41	2040	0	3,841	3,841	79,501	75,660
	Total	735,492	176,552	912,044	2,953,951	2,041,907

EIRR (%) 10.18

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	Benefit	NPV (Bs. 1,000)
15	0.69	305,013	209,100	-95,912
12	0.86	363,070	311,523	-51,547
10	1.02	411,247	417,970	6,723
5	1.69	584,270	988,767	404,497
3	2.16	687,593	1,484,155	796,562

TABLA K.4.14 ANALISIS ECONOMICO DEL PLANO DE ALTERNATIVA-1 (PERIODO DE LA CONSTRUCCION)

II-1. San Juan

Unit : Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	1,035	0	1,035	0	-1,035
2	2001	17,317	0	17,317	0	-17,317
3	2002	17,509	129	17,638	1,959	-15,679
4	2003	20,459	258	20,717	3,918	-16,799
5	2004	14,675	412	15,087	6,256	-8,831
6	2005	0	528	528	8,018	7,490
7	2006	0	528	528	8,018	7,490
8	2007	0	528	528	8,018	7,490
9	2008	0	528	528	8,018	7,490
10	2009	0	528	528	8,018	7,490
11	2010	0	528	528	8,018	7,490
12	2011	0	528	528	8,018	7,490
13	2012	0	528	528	8,018	7,490
14	2013	0	528	528	8,018	7,490
15	2014	0	528	528	8,018	7,490
16	2015	0	528	528	8,018	7,490
17	2016	0	528	528	8,018	7,490
18	2017	0	528	528	8,018	7,490
19	2018	0	528	528	8,018	7,490
20	2019	0	528	528	8,018	7,490
21	2020	0	528	528	8,018	7,490
22	2021	0	528	528	8,018	7,490
23	2022	0	528	528	8,018	7,490
24	2023	0	528	528	8,018	7,490
25	2024	0	528	528	8,018	7,490
26	2025	0	528	528	8,018	7,490
27	2026	0	528	528	8,018	7,490
28	2027	0	528	528	8,018	7,490
29	2028	0	528	528	8,018	7,490
30	2029	0	528	528	8,018	7,490
31	2030	0	528	528	8,018	7,490
32	2031	0	528	528	8,018	7,490
33	2032	0	528	528	8,018	7,490
34	2033	0	528	528	8,018	7,490
35	2034	0	528	528	8,018	7,490
36	2035	0	0	0	0	0
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
40	2039	0	0	0	0	0
41	2040	0	0	0	0	0
	Total	70,995	16,639	87,634	252,673	165,039

EIRR (%) 9.97

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.70	46,661	32,813	-13,848
12	0.86	51,424	44,082	-7,341
10	1.00	55,113	54,965	-148
5	1.58	67,154	106,392	39,238
3	1.98	73,817	146,235	72,418

II-2. Antofagasta

Unit : Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	1,818	0	1,818	0	-1,818
2	2001	28,343	0	28,343	0	-28,343
3	2002	15,775	216	15,991	5,026	-10,965
4	2003	15,304	333	15,637	7,749	-7,888
5	2004	10,581	449	11,030	10,448	-582
6	2005	9,963	528	10,491	12,287	1,796
7	2006	0	607	607	14,125	13,518
8	2007	0	607	607	14,125	13,518
9	2008	0	607	607	14,125	13,518
10	2009	0	607	607	14,125	13,518
11	2010	0	607	607	14,125	13,518
12	2011	0	607	607	14,125	13,518
13	2012	0	607	607	14,125	13,518
14	2013	0	607	607	14,125	13,518
15	2014	0	607	607	14,125	13,518
16	2015	0	607	607	14,125	13,518
17	2016	0	607	607	14,125	13,518
18	2017	0	607	607	14,125	13,518
19	2018	0	607	607	14,125	13,518
20	2019	0	607	607	14,125	13,518
21	2020	0	607	607	14,125	13,518
22	2021	0	607	607	14,125	13,518
23	2022	0	607	607	14,125	13,518
24	2023	0	607	607	14,125	13,518
25	2024	0	607	607	14,125	13,518
26	2025	0	607	607	14,125	13,518
27	2026	0	607	607	14,125	13,518
28	2027	0	607	607	14,125	13,518
29	2028	0	607	607	14,125	13,518
30	2029	0	607	607	14,125	13,518
31	2030	0	607	607	14,125	13,518
32	2031	0	607	607	14,125	13,518
33	2032	0	607	607	14,125	13,518
34	2033	0	607	607	14,125	13,518
35	2034	0	607	607	14,125	13,518
36	2035	0	607	607	14,125	13,518
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
40	2039	0	0	0	0	0
41	2040	0	0	0	0	0
	Total	81,784	19,736	101,520	459,260	357,740

EIRR (%) 16.24

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	1.08	54,210	58,338	4,128
12	1.31	59,589	78,300	18,711
10	1.53	63,772	97,655	33,883
5	2.45	77,551	190,102	112,551
3	3.08	85,273	262,650	177,377

TABLA K.4.15 ANALISIS ECONOMICO DEL PLANO DE ALTERNATIVA-1 (PERIODO DE LA CONSTRUCCION)

II-3. Total of the West Area Project

Unit: Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	2,853	0	2,853	0	-2,853
2	2001	45,660	0	45,660	0	-45,660
3	2002	33,284	345	33,629	6,985	-26,644
4	2003	35,763	591	36,354	11,667	-24,687
5	2004	25,256	861	26,117	16,705	-9,412
6	2005	9,963	1,056	11,019	20,305	9,286
7	2006	0	1,135	1,135	22,143	21,008
8	2007	0	1,135	1,135	22,143	21,008
9	2008	0	1,135	1,135	22,143	21,008
10	2009	0	1,135	1,135	22,143	21,008
11	2010	0	1,135	1,135	22,143	21,008
12	2011	0	1,135	1,135	22,143	21,008
13	2012	0	1,135	1,135	22,143	21,008
14	2013	0	1,135	1,135	22,143	21,008
15	2014	0	1,135	1,135	22,143	21,008
16	2015	0	1,135	1,135	22,143	21,008
17	2016	0	1,135	1,135	22,143	21,008
18	2017	0	1,135	1,135	22,143	21,008
19	2018	0	1,135	1,135	22,143	21,008
20	2019	0	1,135	1,135	22,143	21,008
21	2020	0	1,135	1,135	22,143	21,008
22	2021	0	1,135	1,135	22,143	21,008
23	2022	0	1,135	1,135	22,143	21,008
24	2023	0	1,135	1,135	22,143	21,008
25	2024	0	1,135	1,135	22,143	21,008
26	2025	0	1,135	1,135	22,143	21,008
27	2026	0	1,135	1,135	22,143	21,008
28	2027	0	1,135	1,135	22,143	21,008
29	2028	0	1,135	1,135	22,143	21,008
30	2029	0	1,135	1,135	22,143	21,008
31	2030	0	1,135	1,135	22,143	21,008
32	2031	0	1,135	1,135	22,143	21,008
33	2032	0	1,135	1,135	22,143	21,008
34	2033	0	1,135	1,135	22,143	21,008
35	2034	0	1,135	1,135	22,143	21,008
36	2035	0	607	607	14,125	13,518
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
40	2039	0	0	0	0	0
41	2040	0	0	0	0	0
	Total	152,779	36,375	189,154	711,934	522,780

EIRR (%) 13.41

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.90	100,871	91,151	-9,720
12	1.10	111,012	122,382	11,370
10	1.28	118,881	152,620	33,735
5	2.05	141,705	296,494	151,789
3	2.57	159,090	408,885	249,795

III. Total of the Whole Project

Unit: RM1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	5,740	0	5,740	0	-5,740
2	2001	94,386	0	94,386	0	-94,386
3	2002	82,334	708	83,042	10,002	-73,040
4	2003	90,389	1,317	91,706	17,699	-74,007
5	2004	79,884	1,994	81,878	26,976	-54,902
6	2005	66,364	2,594	68,958	34,790	-34,168
7	2006	85,354	3,080	88,434	40,867	-47,567
8	2007	116,261	3,699	119,960	53,926	-66,034
9	2008	84,231	4,580	88,811	72,255	-16,556
10	2009	94,330	5,201	99,531	84,844	-14,687
11	2010	88,998	5,902	94,900	99,090	4,190
12	2011	0	6,607	6,607	113,438	106,831
13	2012	0	6,607	6,607	113,438	106,831
14	2013	0	6,607	6,607	113,438	106,831
15	2014	0	6,607	6,607	113,438	106,831
16	2015	0	6,607	6,607	113,438	106,831
17	2016	0	6,607	6,607	113,438	106,831
18	2017	0	6,607	6,607	113,438	106,831
19	2018	0	6,607	6,607	113,438	106,831
20	2019	0	6,607	6,607	113,438	106,831
21	2020	0	6,607	6,607	113,438	106,831
22	2021	0	6,607	6,607	113,438	106,831
23	2022	0	6,607	6,607	113,438	106,831
24	2023	0	6,607	6,607	113,438	106,831
25	2024	0	6,607	6,607	113,438	106,831
26	2025	0	6,607	6,607	113,438	106,831
27	2026	0	6,607	6,607	113,438	106,831
28	2027	0	6,607	6,607	113,438	106,831
29	2028	0	6,607	6,607	113,438	106,831
30	2029	0	6,607	6,607	113,438	106,831
31	2030	0	6,607	6,607	113,438	106,831
32	2031	0	6,607	6,607	113,438	106,831
33	2032	0	6,607	6,607	113,438	106,831
34	2033	0	6,607	6,607	113,438	106,831
35	2034	0	6,607	6,607	113,438	106,831
36	2035	0	6,079	6,079	105,420	99,341
37	2036	0	3,841	3,841	79,501	75,660
38	2037	0	3,841	3,841	79,501	75,660
39	2038	0	3,841	3,841	79,501	75,660
40	2039	0	3,841	3,841	79,501	75,660
41	2040	0	3,841	3,841	79,501	75,660
	Total	888,271	212,927	1,101,198	3,665,884	2,564,686

EIRR (%) 10.68

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.74	405,883	300,251	-105,632
12	0.92	474,082	433,905	-40,177
10	1.08	530,132	570,590	40,458
5	1.76	728,975	1,285,261	556,287
3	2.24	856,683	1,893,040	1,036,357

TABLA K.4.16 ANALISIS ECONOMICO DEL PLANO DE ALTERNATIVA-2 (PERIODO DE LA CONSTRUCCION)

I-1. Rio Pailon

Unit: Bs.1,000

	Year	Economic Cost			Economic Benefit (B)	(B)-(C)
		Construction	OM	Total (C)		
1	2000	2,495	0	2,495	0	-2,495
2	2001	42,760	0	42,760	0	-42,760
3	2002	42,760	318	43,078	6,575	-36,503
4	2003	43,426	637	44,063	13,171	-30,892
5	2004	53,592	955	54,547	19,747	-34,800
6	2005	51,762	1,353	53,115	27,976	-25,139
7	2006	0	1,763	1,763	36,454	34,691
8	2007	0	1,763	1,763	36,454	34,691
9	2008	0	1,763	1,763	36,454	34,691
10	2009	0	1,763	1,763	36,454	34,691
11	2010	0	1,763	1,763	36,454	34,691
12	2011	0	1,763	1,763	36,454	34,691
13	2012	0	1,763	1,763	36,454	34,691
14	2013	0	1,763	1,763	36,454	34,691
15	2014	0	1,763	1,763	36,454	34,691
16	2015	0	1,763	1,763	36,454	34,691
17	2016	0	1,763	1,763	36,454	34,691
18	2017	0	1,763	1,763	36,454	34,691
19	2018	0	1,763	1,763	36,454	34,691
20	2019	0	1,763	1,763	36,454	34,691
21	2020	0	1,763	1,763	36,454	34,691
22	2021	0	1,763	1,763	36,454	34,691
23	2022	0	1,763	1,763	36,454	34,691
24	2023	0	1,763	1,763	36,454	34,691
25	2024	0	1,763	1,763	36,454	34,691
26	2025	0	1,763	1,763	36,454	34,691
27	2026	0	1,763	1,763	36,454	34,691
28	2027	0	1,763	1,763	36,454	34,691
29	2028	0	1,763	1,763	36,454	34,691
30	2029	0	1,763	1,763	36,454	34,691
31	2030	0	1,763	1,763	36,454	34,691
32	2031	0	1,763	1,763	36,454	34,691
33	2032	0	1,763	1,763	36,454	34,691
34	2033	0	1,763	1,763	36,454	34,691
35	2034	0	1,763	1,763	36,454	34,691
36	2035	0	1,763	1,763	36,454	34,691
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
40	2039	0	0	0	0	0
41	2040	0	0	0	0	0
	Total	236,795	56,153	292,948	1,161,090	868,142

EIRR (%) 14.33

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.96	143,107	137,247	-5,860
12	1.17	160,037	187,198	27,162
10	1.36	173,301	235,970	62,670
5	2.17	217,222	471,034	253,813
3	3	241,775	656,578	414,803

I-2. Quebrada Chane

Unit: Bs.1,000

	Year	Economic Cost			Economic Benefit (B)	(B)-(C)
		Construction	OM	Total (C)		
1	2000	0	0	0	0	0
2	2001	0	0	0	0	0
3	2002	0	0	0	0	0
4	2003	0	0	0	0	0
5	2004	0	0	0	0	0
6	2005	359	0	359	0	-359
7	2006	6,811	0	6,811	0	-6,811
8	2007	24,424	43	24,467	790	-23,677
9	2008	24,425	224	24,649	4,115	-20,534
10	2009	24,358	406	24,764	7,458	-17,306
11	2010	21,814	587	22,401	10,782	-11,619
12	2011	0	760	760	13,960	13,200
13	2012	0	760	760	13,960	13,200
14	2013	0	760	760	13,960	13,200
15	2014	0	760	760	13,960	13,200
16	2015	0	760	760	13,960	13,200
17	2016	0	760	760	13,960	13,200
18	2017	0	760	760	13,960	13,200
19	2018	0	760	760	13,960	13,200
20	2019	0	760	760	13,960	13,200
21	2020	0	760	760	13,960	13,200
22	2021	0	760	760	13,960	13,200
23	2022	0	760	760	13,960	13,200
24	2023	0	760	760	13,960	13,200
25	2024	0	760	760	13,960	13,200
26	2025	0	760	760	13,960	13,200
27	2026	0	760	760	13,960	13,200
28	2027	0	760	760	13,960	13,200
29	2028	0	760	760	13,960	13,200
30	2029	0	760	760	13,960	13,200
31	2030	0	760	760	13,960	13,200
32	2031	0	760	760	13,960	13,200
33	2032	0	760	760	13,960	13,200
34	2033	0	760	760	13,960	13,200
35	2034	0	760	760	13,960	13,200
36	2035	0	760	760	13,960	13,200
37	2036	0	760	760	13,960	13,200
38	2037	0	760	760	13,960	13,200
39	2038	0	760	760	13,960	13,200
40	2039	0	760	760	13,960	13,200
41	2040	0	760	760	13,960	13,200
	Total	102,191	24,060	126,251	441,944	315,693

EIRR (%) 12.52

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.85	29,730	25,291	-4,439
12	1.04	38,206	39,630	1,424
10	1.21	45,475	54,893	9,417
5	1.92	72,689	139,541	66,852
3	2	89,416	214,786	125,370

TABLA K.4.17 ANALISIS ECONOMICO DEL PLANO DE ALTERNATIVA-2 (PERIODO DE LA CONSTRUCCION)

I-3. Chane Chacras

Unit: Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	0	0	0	0	0
2	2001	0	0	0	0	0
3	2002	852	0	852	0	-852
4	2003	14,076	0	14,076	0	-14,076
5	2004	14,076	105	14,181	2,317	-11,864
6	2005	15,355	209	15,564	4,612	-10,952
7	2006	35,783	314	36,097	6,930	-29,167
8	2007	49,077	572	49,649	12,623	-37,026
9	2008	16,380	953	17,333	21,032	3,699
10	2009	16,380	1,074	17,454	23,702	6,248
11	2010	15,422	1,196	16,618	26,395	9,777
12	2011	0	1,318	1,318	29,087	27,769
13	2012	0	1,318	1,318	29,087	27,769
14	2013	0	1,318	1,318	29,087	27,769
15	2014	0	1,318	1,318	29,087	27,769
16	2015	0	1,318	1,318	29,087	27,769
17	2016	0	1,318	1,318	29,087	27,769
18	2017	0	1,318	1,318	29,087	27,769
19	2018	0	1,318	1,318	29,087	27,769
20	2019	0	1,318	1,318	29,087	27,769
21	2020	0	1,318	1,318	29,087	27,769
22	2021	0	1,318	1,318	29,087	27,769
23	2022	0	1,318	1,318	29,087	27,769
24	2023	0	1,318	1,318	29,087	27,769
25	2024	0	1,318	1,318	29,087	27,769
26	2025	0	1,318	1,318	29,087	27,769
27	2026	0	1,318	1,318	29,087	27,769
28	2027	0	1,318	1,318	29,087	27,769
29	2028	0	1,318	1,318	29,087	27,769
30	2029	0	1,318	1,318	29,087	27,769
31	2030	0	1,318	1,318	29,087	27,769
32	2031	0	1,318	1,318	29,087	27,769
33	2032	0	1,318	1,318	29,087	27,769
34	2033	0	1,318	1,318	29,087	27,769
35	2034	0	1,318	1,318	29,087	27,769
36	2035	0	1,318	1,318	29,087	27,769
37	2036	0	1,318	1,318	29,087	27,769
38	2037	0	1,318	1,318	29,087	27,769
39	2038	0	1,318	1,318	29,087	27,769
40	2039	0	1,318	1,318	29,087	27,769
41	2040	0	1,318	1,318	29,087	27,769
	Total	177,401	43,963	221,364	970,221	748,857

EIRR (%) 15.38

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	1.02	66,861	68,439	1,578
12	1.25	81,564	102,044	20,480
10	1.46	93,790	136,902	43,112
5	2.35	137,750	323,700	185,950
3	3	164,036	486,150	322,114

I-4. Okinawa Drainage

Unit: Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	1,210	0	1,210	0	-1,210
2	2001	19,894	0	19,894	0	-19,894
3	2002	19,366	148	19,514	2,657	-16,857
4	2003	11,718	296	12,014	5,314	-6,700
5	2004	11,720	383	12,103	6,876	-5,227
6	2005	11,037	470	11,507	8,438	-3,069
7	2006	0	557	557	10,000	9,443
8	2007	0	557	557	10,000	9,443
9	2008	0	557	557	10,000	9,443
10	2009	0	557	557	10,000	9,443
11	2010	0	557	557	10,000	9,443
12	2011	0	557	557	10,000	9,443
13	2012	0	557	557	10,000	9,443
14	2013	0	557	557	10,000	9,443
15	2014	0	557	557	10,000	9,443
16	2015	0	557	557	10,000	9,443
17	2016	0	557	557	10,000	9,443
18	2017	0	557	557	10,000	9,443
19	2018	0	557	557	10,000	9,443
20	2019	0	557	557	10,000	9,443
21	2020	0	557	557	10,000	9,443
22	2021	0	557	557	10,000	9,443
23	2022	0	557	557	10,000	9,443
24	2023	0	557	557	10,000	9,443
25	2024	0	557	557	10,000	9,443
26	2025	0	557	557	10,000	9,443
27	2026	0	557	557	10,000	9,443
28	2027	0	557	557	10,000	9,443
29	2028	0	557	557	10,000	9,443
30	2029	0	557	557	10,000	9,443
31	2030	0	557	557	10,000	9,443
32	2031	0	557	557	10,000	9,443
33	2032	0	557	557	10,000	9,443
34	2033	0	557	557	10,000	9,443
35	2034	0	557	557	10,000	9,443
36	2035	0	557	557	10,000	9,443
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
40	2039	0	0	0	0	0
41	2040	0	0	0	0	0
	Total	74,945	18,007	92,952	323,285	230,333

EIRR (%) 12.21

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.83	48,368	40,239	-8,129
12	1.02	53,435	54,255	820
10	1.18	57,383	67,871	10,488
5	1.89	70,397	133,063	62,666
3	2	77,679	184,302	106,623

TABLA K.4.18 ANALISIS ECONOMICO DEL PLANO DE ALTERNATIVA-2 (PERIODO DE LA CONSTRUCCION)

I-5.Total of The East Area Project

Unit : Bs.1,000

	Year	Economic Cost			Economic	(B)-(C)
		Construction	OM	Total (C)	Benefit (B)	
1	2000	3,705	0	3,705	0	-3,705
2	2001	62,654	0	62,654	0	-62,654
3	2002	62,978	466	63,444	9,232	-54,212
4	2003	69,220	933	70,153	18,486	-51,667
5	2004	79,388	1,443	80,831	28,940	-51,891
6	2005	78,513	2,032	80,545	41,027	-39,518
7	2006	42,594	2,634	45,228	53,384	8,156
8	2007	73,501	2,935	76,436	59,867	-16,569
9	2008	40,805	3,497	44,302	71,600	27,298
10	2009	40,738	3,800	44,538	77,614	33,076
11	2010	37,236	4,103	41,339	83,631	42,292
12	2011	0	4,398	4,398	89,501	85,103
13	2012	0	4,398	4,398	89,501	85,103
14	2013	0	4,398	4,398	89,501	85,103
15	2014	0	4,398	4,398	89,501	85,103
16	2015	0	4,398	4,398	89,501	85,103
17	2016	0	4,398	4,398	89,501	85,103
18	2017	0	4,398	4,398	89,501	85,103
19	2018	0	4,398	4,398	89,501	85,103
20	2019	0	4,398	4,398	89,501	85,103
21	2020	0	4,398	4,398	89,501	85,103
22	2021	0	4,398	4,398	89,501	85,103
23	2022	0	4,398	4,398	89,501	85,103
24	2023	0	4,398	4,398	89,501	85,103
25	2024	0	4,398	4,398	89,501	85,103
26	2025	0	4,398	4,398	89,501	85,103
27	2026	0	4,398	4,398	89,501	85,103
28	2027	0	4,398	4,398	89,501	85,103
29	2028	0	4,398	4,398	89,501	85,103
30	2029	0	4,398	4,398	89,501	85,103
31	2030	0	4,398	4,398	89,501	85,103
32	2031	0	4,398	4,398	89,501	85,103
33	2032	0	4,398	4,398	89,501	85,103
34	2033	0	4,398	4,398	89,501	85,103
35	2034	0	4,398	4,398	89,501	85,103
36	2035	0	4,398	4,398	89,501	85,103
37	2036	0	2,078	2,078	43,047	40,969
38	2037	0	2,078	2,078	43,047	40,969
39	2038	0	2,078	2,078	43,047	40,969
40	2039	0	2,078	2,078	43,047	40,969
41	2040	0	2,078	2,078	43,047	40,969
	Total	591,332	142,183	733,515	2,896,541	2,163,026

EIRR (%) **14.04**

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	Benefit	NPV (Bs. 1,000)
15	0.94	288,066	271,216	-16,850
12	1.15	333,242	383,128	49,886
10	1.34	369,948	495,636	125,688
5	2.14	498,057	1,067,338	569,281
3	3	572,906	1,541,816	968,910

TABLA K.4.19 ANALISIS ECONOMICO DEL PLANO DE ALTERNATIVA-2 (PERIODO DE LA CONSTRUCCION)

II-1. San Juan

Unit: Bs.1,000

	Year	Economic Cost			Economic Benefit (B)	(B)-(C)
		Construction	OM	Total (C)		
1	2000	1,312	0	1,312	0	-1,312
2	2001	22,194	0	22,194	0	-22,194
3	2002	22,092	165	22,257	2,209	-20,048
4	2003	20,152	330	20,482	4,417	-16,065
5	2004	14,674	483	15,157	6,465	-8,692
6	2005	0	599	599	8,018	7,419
7	2006	0	599	599	8,018	7,419
8	2007	0	599	599	8,018	7,419
9	2008	0	599	599	8,018	7,419
10	2009	0	599	599	8,018	7,419
11	2010	0	599	599	8,018	7,419
12	2011	0	599	599	8,018	7,419
13	2012	0	599	599	8,018	7,419
14	2013	0	599	599	8,018	7,419
15	2014	0	599	599	8,018	7,419
16	2015	0	599	599	8,018	7,419
17	2016	0	599	599	8,018	7,419
18	2017	0	599	599	8,018	7,419
19	2018	0	599	599	8,018	7,419
20	2019	0	599	599	8,018	7,419
21	2020	0	599	599	8,018	7,419
22	2021	0	599	599	8,018	7,419
23	2022	0	599	599	8,018	7,419
24	2023	0	599	599	8,018	7,419
25	2024	0	599	599	8,018	7,419
26	2025	0	599	599	8,018	7,419
27	2026	0	599	599	8,018	7,419
28	2027	0	599	599	8,018	7,419
29	2028	0	599	599	8,018	7,419
30	2029	0	599	599	8,018	7,419
31	2030	0	599	599	8,018	7,419
32	2031	0	599	599	8,018	7,419
33	2032	0	599	599	8,018	7,419
34	2033	0	599	599	8,018	7,419
35	2034	0	599	599	8,018	7,419
36	2035	0	0	0	0	0
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
40	2039	0	0	0	0	0
41	2040	0	0	0	0	0
	Total	80,424	18,948	99,372	253,631	154,259

EIRR (%) 8.48

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.62	53,759	33,367	-20,392
12	0.76	59,061	44,696	-14,366
10	0.88	63,164	55,623	-7,541
5	1.40	76,538	107,182	30,634
3	2	83,962	147,087	63,125

II-2. Antofagasta

Unit: Bs.1,000

	Year	Economic Cost			Economic Benefit (B)	(B)-(C)
		Construction	OM	Total (C)		
1	2000	1,818	0	1,818	0	-1,818
2	2001	28,343	0	28,343	0	-28,343
3	2002	15,775	216	15,991	5,026	-10,965
4	2003	15,304	333	15,637	7,749	-7,888
5	2004	10,581	449	11,030	10,448	-582
6	2005	9,963	528	10,491	12,287	1,796
7	2006	0	607	607	14,125	13,518
8	2007	0	607	607	14,125	13,518
9	2008	0	607	607	14,125	13,518
10	2009	0	607	607	14,125	13,518
11	2010	0	607	607	14,125	13,518
12	2011	0	607	607	14,125	13,518
13	2012	0	607	607	14,125	13,518
14	2013	0	607	607	14,125	13,518
15	2014	0	607	607	14,125	13,518
16	2015	0	607	607	14,125	13,518
17	2016	0	607	607	14,125	13,518
18	2017	0	607	607	14,125	13,518
19	2018	0	607	607	14,125	13,518
20	2019	0	607	607	14,125	13,518
21	2020	0	607	607	14,125	13,518
22	2021	0	607	607	14,125	13,518
23	2022	0	607	607	14,125	13,518
24	2023	0	607	607	14,125	13,518
25	2024	0	607	607	14,125	13,518
26	2025	0	607	607	14,125	13,518
27	2026	0	607	607	14,125	13,518
28	2027	0	607	607	14,125	13,518
29	2028	0	607	607	14,125	13,518
30	2029	0	607	607	14,125	13,518
31	2030	0	607	607	14,125	13,518
32	2031	0	607	607	14,125	13,518
33	2032	0	607	607	14,125	13,518
34	2033	0	607	607	14,125	13,518
35	2034	0	607	607	14,125	13,518
36	2035	0	607	607	14,125	13,518
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
40	2039	0	0	0	0	0
41	2040	0	0	0	0	0
	Total	81,784	19,736	101,520	459,260	357,740

EIRR (%) 16.24

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	1.08	54,210	58,338	4,128
12	1.31	59,589	78,300	18,711
10	1.53	63,772	97,655	33,883
5	2.45	77,551	190,102	112,551
3	3	85,273	262,650	177,377

TABLA K.4.20 ANALISIS ECONOMICO DEL PLANO DE ALTERNATIVA-2 (PERIODO DE LA CONSTRUCCION)

II-3. Total of the West Area Project

Unit: Bs.1,000

	Year	Economic Cost			Economic Benefit (B)	(B)-(C)
		Construction	OM	Total (C)		
1	2000	3,130	0	3,130	0	-3,130
2	2001	50,537	0	50,537	0	-50,537
3	2002	37,867	381	38,248	7,235	-31,013
4	2003	35,456	663	36,119	12,166	-23,953
5	2004	25,255	932	26,187	16,914	-9,273
6	2005	9,963	1,127	11,090	20,305	9,215
7	2006	0	1,206	1,206	22,143	20,937
8	2007	0	1,206	1,206	22,143	20,937
9	2008	0	1,206	1,206	22,143	20,937
10	2009	0	1,206	1,206	22,143	20,937
11	2010	0	1,206	1,206	22,143	20,937
12	2011	0	1,206	1,206	22,143	20,937
13	2012	0	1,206	1,206	22,143	20,937
14	2013	0	1,206	1,206	22,143	20,937
15	2014	0	1,206	1,206	22,143	20,937
16	2015	0	1,206	1,206	22,143	20,937
17	2016	0	1,206	1,206	22,143	20,937
18	2017	0	1,206	1,206	22,143	20,937
19	2018	0	1,206	1,206	22,143	20,937
20	2019	0	1,206	1,206	22,143	20,937
21	2020	0	1,206	1,206	22,143	20,937
22	2021	0	1,206	1,206	22,143	20,937
23	2022	0	1,206	1,206	22,143	20,937
24	2023	0	1,206	1,206	22,143	20,937
25	2024	0	1,206	1,206	22,143	20,937
26	2025	0	1,206	1,206	22,143	20,937
27	2026	0	1,206	1,206	22,143	20,937
28	2027	0	1,206	1,206	22,143	20,937
29	2028	0	1,206	1,206	22,143	20,937
30	2029	0	1,206	1,206	22,143	20,937
31	2030	0	1,206	1,206	22,143	20,937
32	2031	0	1,206	1,206	22,143	20,937
33	2032	0	1,206	1,206	22,143	20,937
34	2033	0	1,206	1,206	22,143	20,937
35	2034	0	1,206	1,206	22,143	20,937
36	2035	0	607	607	14,125	13,518
37	2036	0	0	0	0	0
38	2037	0	0	0	0	0
39	2038	0	0	0	0	0
40	2039	0	0	0	0	0
41	2040	0	0	0	0	0
	Total	162,208	38,684	200,892	712,891	511,999

EIRR (%) 12.51

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.85	107,968	91,704	-16,264
12	1.04	118,650	122,996	4,346
10	1.21	126,936	153,278	26,342
5	1.93	154,099	297,284	143,185
3	2	160,235	400,737	240,502

III. Total of the Whole Project

Unit: RM1,000

	Year	Economic Cost			Economic Benefit (B)	(B)-(C)
		Construction	OM	Total (C)		
1	2000	6,835	0	6,835	0	-6,835
2	2001	113,191	0	113,191	0	-113,191
3	2002	100,845	847	101,692	16,467	-85,225
4	2003	104,676	1,596	106,272	30,652	-75,620
5	2004	104,643	2,375	107,018	45,854	-61,164
6	2005	88,476	3,159	91,635	61,331	-30,304
7	2006	42,594	3,840	46,434	75,527	29,093
8	2007	73,501	4,141	77,642	82,010	4,368
9	2008	40,805	4,703	45,508	93,743	48,235
10	2009	40,738	5,006	45,744	99,757	54,013
11	2010	37,236	5,309	42,545	105,774	63,229
12	2011	0	5,604	5,604	111,644	106,040
13	2012	0	5,604	5,604	111,644	106,040
14	2013	0	5,604	5,604	111,644	106,040
15	2014	0	5,604	5,604	111,644	106,040
16	2015	0	5,604	5,604	111,644	106,040
17	2016	0	5,604	5,604	111,644	106,040
18	2017	0	5,604	5,604	111,644	106,040
19	2018	0	5,604	5,604	111,644	106,040
20	2019	0	5,604	5,604	111,644	106,040
21	2020	0	5,604	5,604	111,644	106,040
22	2021	0	5,604	5,604	111,644	106,040
23	2022	0	5,604	5,604	111,644	106,040
24	2023	0	5,604	5,604	111,644	106,040
25	2024	0	5,604	5,604	111,644	106,040
26	2025	0	5,604	5,604	111,644	106,040
27	2026	0	5,604	5,604	111,644	106,040
28	2027	0	5,604	5,604	111,644	106,040
29	2028	0	5,604	5,604	111,644	106,040
30	2029	0	5,604	5,604	111,644	106,040
31	2030	0	5,604	5,604	111,644	106,040
32	2031	0	5,604	5,604	111,644	106,040
33	2032	0	5,604	5,604	111,644	106,040
34	2033	0	5,604	5,604	111,644	106,040
35	2034	0	5,604	5,604	111,644	106,040
36	2035	0	5,005	5,005	103,626	98,621
37	2036	0	2,078	2,078	43,047	40,969
38	2037	0	2,078	2,078	43,047	40,969
39	2038	0	2,078	2,078	43,047	40,969
40	2039	0	2,078	2,078	43,047	40,969
41	2040	0	2,078	2,078	43,047	40,969
	Total	753,540	180,867	934,407	3,609,432	2,675,025

EIRR (%) 13.63

Discount Rate (%)	B/C	PV(Bs. 1,000) Cost	PV(Bs. 1,000) Benefit	NPV (Bs. 1,000)
15	0.92	396,035	362,920	-33,114
12	1.12	451,892	506,124	54,232
10	1.31	496,884	648,914	152,030
5	2.09	652,157	1,364,623	712,466
3	3	742,142	1,951,554	1,209,412

APENDICE

TERMINOS DE REFERENCIA DE LEVANTAMIENTO TOPOGRAFICO

TABLE OF CONTENTS

APPENDIX

1. TERMS OF REFERENCE FOR AERIAL PHOTOGRAPHY

Chapter 1 *General*

Section 1 *Background*

In compliance with the Scope of Work for the The Master Plan Study on Flood Control in the Northern Rural Region of Santa Cruz in the Republic of Bolivia, which was agreed upon between the Santa Cruz Regional Development Corporation and the Japan International Cooperation Agency (JICA) on December 14th 1994, JICA has decided to carry out the Aerial Photography Works and assigned JICA Study Team for execution of the works.

The aerial photography shall be carried out in the Republic of Bolivia by (Agency) under supervision of the Study Team's Supervisior.

Section 2 *Specifications*

The flight for aerial photography shall be conducted by the photogrammetric method in accordance with the Specifications written hereunder.

Section 3 *Scope of Work*

The work to be done is to carry out flight for aerial photography in the proposed site of the Northern Rural Region of Santa Cruz in the Republic of Bolivia.

The quantity of the work is estimated as follows:

Aerial photography at a scale of 1/60,000 (see attached map) ; approx. 8,500 km2

Section 4 *Unit to be Used*

Unit of measurement provided for by Japanese Law of Measurement (Metric System) shall be used.

Section 5 *Language*

Language to be used shall be English.

Chapter 2 *Detail Specification*

Section 1 *Method of Work*

All the work to be done shall be executed in accordance with this Specification or where not specified therein, in accordance with such instruction and orders as the Supervisor of the Study Team may give.

Section 2 *Flight for Photo-taking.*

Flight for photo-taking shall be carried out based on the following items.

(Airplane)

Aerial photographying aircraft shall meet the following requirements:

1. to be stable with full load while in flight to required height
2. to have unobstructed vision in all directions
3. to be able to install aerial camera at a position where exhaust fumes will not effect the aerial photography
4. to have a navigation system suitable for local conditions
5. to have an undistorted and calibrated view-finder window-glass if necessary

(Flight Direction and Altitude)

Flight direction	: East - West
Flight altitude	: approx. 9,400m
Focal length	: 153mm

(Flight Course)

6. Flight shall be carried out in accordance with the flight plan map attached hereto.
   Total : 12 courses

7. There shall be adequate stereoscopic coverage in the photo-taking area.
   The average overlap is 60% and sidelap 30%.

8. Overlap, sidelap, crab, tip and tilt shall be within the following tolerances:

Overlap	: more than 55% and less than 65%
Sidelap	: more than 10%
Crab	: less than 10 degrees
Tip and tilt	: less than 5 degrees

9. When a flight line is broken, that part shall be covered by an overlap of more than 2 models.

10. Photo images shall not be spoiled by cloud or mist. However, this may be permissible to the extent of 5% if they are covered by the photographs of adjacent strips.

(Re-flight)

11. Re-flight shall be carried out immediately in accordance with the guidance of supervisor, when film is rejected.

Chapter 3 *Work Schedule*

Completion date shall be by the____th of July, 1995.
Priority area for aerial photography shall be the mapping area.

Chapter 4 *Final Products to be delivered*

The Agency shall deliver the following final products and flight record to the Study Team :

1. *Aerial Photography*

(1) Negative film (8,500 km2)	:	1 set
(2) Positive film (8,500 km2)	:	1 set
(3) Contact print (8,500 km2)	:	3 sets
(4) Photo index map	:	1 set

2. *Flight Record*

(1) name of contract
(2) name of photographing organization
(3) beginning and end times of flight
(4) date of flight
(5) type of aircraft
(6) flight altitude
(7) calibration report of camera

2. TERMS OF REFERENCE FOR THE RIVER SURVEY

2.1 Phase 1

Chapter 1 *General*

Section 1 *Background*

In compliance with the Scope of Work for the Master Plan Study on Flood Control in the Northern Rural Region of Santa Cruz in the Republic of Bolivia, which was agreed upon between the Santa Cruz Regional Development Corporation and the Japan International Cooperation Agency (JICA) on December 14, 1994, JICA has decided to carry out the Topographic Survey Work and assigned JICA Study Team for execution of the works.

The Topographic Survey shall be carried out in the Republic of Bolivia, by the Agriconsult Santa Cruz Ltda.(Agency) under supervision of the Study Team's Supervisor.

Section 2 *Specifications*

The survey works shall be conducted by the topographic mapping method in accordance with the Specifications written hereunder.

Section 3 *Scope of Work*

The work to be done is to carry out the Longitudinal Profile and the Cross Section Survey in the proposed site of the Northern Rural Region of Santa Cruz in the Republic of Bolivia.

The quantity of the work is estimated as follows:

-Smaller rivers; Chane, Pailon, Jochie etc. : approx. 115 km & 60 sections.
-Larger rivers; Grande and Yapakani : approx. 150 km & 12 sections.

Section 4 *Unit to be Used*

Unit of measurement provided for by Japanese Law of Measurement (Metric System) shall be used.

Section 5 *Language*

Language to be used shall be English.

Chapter 2 *Detail Specification*

Section 1 *Method of Work*

All the work to be done shall be executed in accordance with this Specification or where not specified therein, in accordance with such instruction and orders as the Supervisor of the Study Team may give.

Section 2 *Quantity and Location of Work*

1. Pailón river (35km, 18 sections)
   From confluence of Chané river to Colonia Okinawa No.2

2. Chané river (40km, 21 sections)
   Downstream stretch from Estancia La Reohela (near National Road No.9)

3. Around the Colonia San Juan (40km, 21 sections)
   Yapacanicíto river; (15km, 8 sections)
   Jochi river; (15km, 8 sections)
   Tejeria river; (10km, 5 sections)

4. Grande and Yapacani Rivers (150 km, 12 sections)
   Grande river; 100 km, 8 sections
   Yapacani river; 50km, 4 sections

Section 3 *Longitudinal Profile and Cross Section Survey*

(Preparation)

The timber piles shall be established on one side of river in advance, located perpendicular to the river center line, as instructed by the Study Team and/or on the location maps.

(Leveling for the timber piles)

Elevation of the each timber pile shall be determined by direct leveling or GPS surveying from existing bench marks established on the national highway by IGM.

Accuracy : 6cm $\sqrt{S}$, where "S" in kilometer

(Cross section survey)

Cross section survey shall be carried out by direct leveling, echo sounding or trigonometric leveling.

The cross sections shall be approximately 100m to 2,500m in width, and surveyed at approximately 2km intervals along the river center line.

Accuracy : 5cm + 3cm $\sqrt{s}$, where "s" in meter

Drawing (Scale) : H = 1 / 100 ~ 1 / 4,000
V = 1 / 100 ~ 1 / 200

(Longitudinal profile survey)

Longitudinal profile shall be drawn according to the results of elevations, measured during the cross section survey of the river center.

Drawing (Scale) : H = 1 / 50,000 ~ 1 / 100,000
V = 1 / 100 ~ 1 / 1,000

Chapter 3 *Work Schedule*

The works shall be completed within 2.5 moths from commencement date, by the____th of July 1995.

Chapter 4 *Final Products to be delivered*

The Agency shall deliver the following final result and products to the Study Team :

(1) Drawn sheets of Cross sections (72 sections)	:	1 set
(2) Copy of Cross sections	:	2 sets
(3) Drawn sheets of Longitudinal profile	:	1 set
(4) Copy of Longitudinal profile	:	2 sets
(5) Index map	:	1 set
(6) Observation and Computation results	:	1 set

2.2 Phase 2

Chapter 1 *General*

Section 1 *Background*

In compliance with the Scope of Work for the Master Plan Study on Flood Control in the Northern Rural Region of Santa Cruz in the Republic of Bolivia, which was agreed upon between the Santa Cruz Regional Development Corporation and the Japan International Cooperation Agency (JICA) on December 14, 1994, JICA has decided to carry out the Topographic Survey Work (Second Stage) and assigned JICA Study Team for execution of the works.

The Topographic Survey (Second Stage) shall be carried out in the Republic of Bolivia, by the Agriconsult Santa Cruz Ltda.(Agency) under supervision of the Study Team's Supervisor.

Section 2 *Specifications*

The survey works shall be conducted by the topographic mapping method in accordance with the Specifications written hereunder.

Section 3 *Scope of Work*

The work to be done is to carry out the Longitudinal Profile and the Cross Section Survey in the proposed site of the Northern Rural Region of Santa Cruz in the Republic of Bolivia.

The quantity of the work is estimated as follows:

- Longitudinal Profile : approx. 60 km
- Cross Section : 30 sections

Section 4 *Unit to be Used*

Unit of measurement provided for by Japanese Law of Measurement (Metric System) shall be used.

Section 5 *Language*

Language to be used shall be English.

Chapter 2 *Detail Specification*

Section 1 *Method of Work*

All the work to be done shall be executed in accordance with this Specification or where not specified therein, in accordance with such instruction and orders as the Supervisor of the Study Team may give.

Section 2 *Quantity and Location of Work*

A. Pailon River & Tributaries	
1. Okinawa Drainage (5 km):	3 sections
B. Chane River & Tributaries	
2. Chané river (7 km):	3 sections
3. El Toro river (16 km):	6 sections
4. Maras river (6 km):	3 sections
5. Chacras river (11 km):	3 sections
C. San Juan Rivers	
6. Jochi river (9 km):	4 section
7. Tacuaral river (6 km):	3 section
8. Palacios river:	1 section
9. Quimori river :	1 section
10. Lupe rivers (2 km):	1 section
11. Asuvicito river (2 km):	1 section
D. Large River	
12. Grande river (3 km):	1 section
(including Okinawa Drainage)	
Total (73 km)	30 sections

Section 3 *Longitudinal Profile and Cross Section Survey*

(Preparation)

The timber piles shall be established on one side of river in advance, located perpendicular to the river center line, as instructed by the Study Team and/or on the location maps.

(Leveling for the timber piles)

Elevation of the each timber pile shall be determined by direct leveling or GPS surveying from existing bench marks established on the national highway by IGM.

Accuracy : 6cm x $\sqrt{S}$, where "S" in kilometer

(Cross section survey)

Cross section survey shall be carried out by direct leveling, echo sounding or trigonometric leveling. The cross sections shall be approximately 100m to 3,000m in width, and surveyed at approximately 2 km intervals along the river center line.

Accuracy : 5cm + 3cm x $\sqrt{s}$, where "s" in meter

Drawing : H = 1 / 100 ~ 1 / 4,000

(Scale) V = 1 / 100 ~ 1 / 200

(Longitudinal profile survey)

Longitudinal profile shall be drawn according to the results of elevations, measured during the cross section survey of the river center.

Drawing : H = 1 / 50,000 ~ 1 / 100,000

(Scale) V = 1 / 100 ~ 1 / 1,000

Chapter 3 *Work Schedule*

The works shall be completed within one (1) month from commencement date, by the____ of _____, 1995.

Chapter 4 ***Final Products to be delivered***

The Agency shall deliver the following final result and products to the Study Team :

(1) Drawn sheets of Cross sections (30 sections)	:	1 set
(2) Copy of Cross sections	:	2 sets
(3) Drawn sheets of Longitudinal profile	:	1 set
(4) Copy of Longitudinal profile	:	2 sets
(5) Index map	:	1 set
(6) Observation and Computation results	:	1 set

3. TERMS OF REFERENCE FOR WATER QUALITY ANALYSIS

3.1 Phase 1

1. GENERAL

1.1 The Consultant shall conduct the Water Quality Survey Works to find out the environmental conditions of river water in the rainy season within the objective area for the Master Plan Study on Flood Control in the Northern Rural Region of Santa Cruz in the Republic of Bolivia, with a view of studying the possibility of maltipurpose use of the flood control project, such as river water for cultivation, retarding pond for sewage treatment, water surface for fish culture and so on. JICA Study Team shall examine all outcome of the survey before accepting final reports.

1.2 All measurement in the survey shall be recorded in metric units.

1.3 The Consultant is responsible for providing all required manpower and equipment relating to the survey works.

1.4 If there are any other Terms of Reference required for execution of the survey, they shall be discussed for consensus by JICA Study Team and the Consultant.

1.5 The Consultant shall submit an Inception Report, including following items, in English and Spanish before the commencement of the works.

- Methodology
- Work Schedule
- Staff Schedule

1.6 The size of reports and documents shall be A-4 size principally.

2. DESCRIPTION

2.1 Survey Area

The Survey Area shall be within the Northern Rural Region of Santa Cruz.

2.2 Description of Works

The aim of the works is to conduct a water quality survey as follows:

-Sampling locations : 5 locations in the survey area

-3 locations : at the outlet of the sewage of the Santa Cruz city and settlement areas

-2 locations : at the rivers polluted in the study area

-Sampling : 24 samplings in total at 5 locations

-at 3 locations : 2-samplings/day during 3 selected days

-at 2 locations : 1-samplings/day during 3 selected days

-Measurement and analysis items

-Water tempereture

-Electric conductibity

-pH

-BOD

-DO

-SS

-Number of coliform groups

The sampling locations and days are to be selected by the JICA Study Team, and the consultant shall prepare all staff and instruments required for sampling and laboratory analysis.

2.3 Work Schedule

The Survey works shall be completed within 3 weeks from commencement date, by the_____ of May 1995.

2.3 Submission of Documents

The Consultant shall submit the following documents in English and Spanish as follows:

- The Final Report (English) 5 copies
- The Final Report (Spanish) 5 copies

3.2 Phase 2

1. GENERAL

1.1 The Consultant shall conduct the Water Quality Survey Works to find out the environmental conditions of river water in the dry season within the objective area for the Master Plan Study on Flood Control in the Northern Rural Region of Santa Cruz in the Republic of Bolivia, with a view of studying the possibility of multipurpose use of the flood control project, such as river water for cultivation, retarding pond for sewage treatment, water surface for fish culture and so on. JICA Study Team shall examine all outcome of the survey before accepting final reports.

1.2 All measurement in the survey shall be recorded in metric units.

1.3 The Consultant is responsible for providing all required manpower and equipment relating to the survey works.

1.4 If there are any other Terms of Reference required for execution of the survey, they shall be discussed for consensus by JICA Study Team and the Consultant.

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-Water temperature
-Electric conductivity
-pH
-BOD
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-Number of coliform groups

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