

# ***TABLES***

Table E.1 Summary of Barangay Data Base in Seobla/Mamban River Basin

Province	Municipality	Barangay	Area in sq.km	Population in 1994	House Holds 1994	Building Residential	Building Non-Residential	Land Cultivable Area (ha)	Road Length (m)	Infrastructure No. of Bridges	Irrigation Scheme (m)	Value of Assets (P 1000 pesos)			
												Buildings	Land	Libra-structure	
PAMPANGA	MABALAGAT	CAGUTUD	1.99	840	200	101	5	0.00	171	0	7,101	521	0.00	256	
		DOLORES	5.45	256	49	1,721	2	4.91	5,659	0	0	0	1,329	87.02	5,030
		MANATITANG	2.01	1,201	233	261	1	118.22	0	0	0	518	7,558	2,097.16	243
		SAN JOAQUIN	6.63	4,402	902	1,125	2	106.13	6,155	0	0	0	55,724	1,883.10	9,729
		SAPANGBALEN	11.33	0	0	0	0	323.86	0	0	0	14,890	0	5,711.51	3,010
		STA INES	2.77	3,580	780	28	14	252.80	0	0	0	6,233	36,159	4,290.28	3,902
		TABUN	5.61	0	0	0	0	0.00	2,576	1	1	0	0	0.00	801
		MABALACAT	15.79	10,349	2,164	3,336	24	806	14,471	1	1	28,682	83,291	14,079	22,972
		MAGALANG	4.26	985	163	187	0	253.32	0	0	0	47,681	62,111	3,376.52	28,823
		SAN AGUSTIN	31.29	1,500	240	0	0	190.42	0	0	0	10,502	11,080	2,016.98	6,593
		SAN ROQUE	6.82	1,879	321	337	0	637.87	0	0	0	76,398	13,915	8,910.09	48,894
		STO. ROSARIO	10.52	2,690	488	257	0	779.88	0	0	0	41,112	17,679	14,034.25	21,959
		TURU	25.46	896	140	106	0	1,970.45	0	0	0	107,211	6,068	23,124.61	68,607
		MAGALANG	78.35	7,950	1,352	887	3	3,832	0	0	0	282,703	54,954	51,466	172,906
		TARLAC	MAMBAN	BANABA	0.44	830	220	755	0	0.66	5,311	0	7,538	0	0.59
BANGCU	2.24			0	0	0	0	3.22	0	1	2,562	0	34.26	307	
LA PAZ	2.19			602	123	90	1	139.19	0	0	0	2,842	1,761.34	0	
LOURDES	1.43			765	163	1,660	22	16.93	15,165	0	0	0	11,974	180.31	21,148
MALONZO	2.36			0	0	0	0	0.00	0	0	25,273	0	0.00	348	
PACALCAL	2.25			666	128	80	0	173.91	0	0	0	0	3,335	1,851.64	0
SAN NICOLAS (POB.)	1.14			5,780	1,140	1,409	57	0.00	268	2	0	0	7,934	0.02	188
SAN PEDRO	4.18			0	0	0	0	0.00	0	1	0	0	0	0.00	14
SAN VICENTE	1.10			534	120	149	0	0.00	0	0	0	0	4,943	0.00	0
STO. NINO	1.31			668	150	107	0	0.00	0	0	0	0	6,503	0.00	0
BAMBAN	18.72			9,435	2,044	4,250	80	333	20,744	4	0	27,835	44,871	3,428	27,726
CONCEPCION	2.07			4,340	700	455	0	0.00	0	0	0	8,377	4,152	0.18	734
CAPE	1.983			363	61	61	0	0.00	0	0	0	4,047	4,001	0.00	635
CALUS GUECO	0.58			1,320	240	163	1	34.99	0	0	0	0	10,283	372.59	0
CASTILLO	17.56			2,180	420	115	0	265.67	0	0	0	0	10,874	2,996.31	0
CULATINGAN	6.22	2,229	399	4	0	0.00	0	0	0	5,976	8,595	0.00	1,901		
DUNGAN	7.63	673	130	470	0	643.93	3,835	1	14	0	4,731	8,498.89	4,976		
GREEN VILLAGE	0.90	1,395	277	647	0	62.85	1,603	0	76	12,008	901.95	2,295	0		
ILIBANGAN	4.00	700	140	353	0	8.65	0	0	0	1,125	864	92.11	0		
MAGAO	8.91	2,740	460	356	0	0.00	0	0	0	0	1,504	0.00	54		
MALUPA	2.14	1,460	280	231	0	0.00	0	0	0	0	4,092	0.00	0		
MINANE	2.82	4,420	720	1,487	6	88.07	15,327	3	0	3,687	17,138	1,049.94	13,551		
PANALISICAN	9.57	1,240	240	705	0	894.48	0	0	0	39,280	10,190	9,846.77	24,625		
SAN ANTONIO	4.54	3,360	520	240	1	320.75	1,854	1	1	2,344	16,386	3,538.96	3,943		
SAN BARTOLOME	5.01	2,040	360	690	0	341.40	790	0	0	24,667	15,557	3,635.02	16,142		
SAN FRANCISCO	3.06	4,839	942	642	3	222.60	8,028	0	0	31,833	2,751.24	8,618	0		
SAN ISIDRO	7.79	2,560	480	850	0	695.03	0	0	0	47,151	20,740	7,518.33	30,079		
SAN JOSE (POB.)	0.67	6,248	1,195	418	60	52.31	1,079	0	0	65,318	557.01	1,510	0		
SAN MARTIN	3.65	1,000	240	178	0	3.72	68	0	0	0	56	39.64	0		
SAN NICOLAS (POB.)	0.99	2,797	391	611	473	46.78	4,208	0	0	6,254	132,163	681.57	9,894		
SAN NICOLAS BALAS	6.07	2,860	480	640	2	268.43	6,443	1	1	24,537	11,503	3,022.81	15,063		
SAN VICENTE	3.26	1,340	240	81	19	32.96	326	2	2	6,274	1,849	353.95	797		
STA MONICA	7.13	3,980	747	0	3	0.00	0	0	0	33,038	0.00	0.00	0		
STA RITA	3.08	4,080	960	884	4	16.98	2,841	2	2	13,082	2,361	180.76	818		
STO CRISTO	0.54	1,000	240	141	1	0.00	2,245	0	0	0	10,426	0.00	3,082		
TALAM. MARIMLA	4.06	1,231	223	377	0	11.96	0	0	0	0	2,223	127.31	0		
TALAM. SAN MIGUEL	5.44	1,160	240	34	2	0.00	0	0	0	0	0	10,855	0.00	0	
TELABANCA	9.31	0	0	0	0	46.56	0	0	0	57,239	392	664.00	1,906		
CONCEPCION	25.06	6,235	11,829	10,827	575	3,994	48,546	10	10	250,129	483,136	46,876	139,979		
Total	267.93	91,339	17,389	19,300	682	8,669	85,761	15	15	589,549	624,251	116,200	363,544		

Table E.1. Summary of Flooding Data Base in Scobias/Bamban River Basin

Province	Municipality	Barangay	Flood Damages by Return Period (x1000 pesos)			Flood Damages by Return Period (x1000 pesos)			Flood Damages by Return Period (x1000 pesos)		
			Buildings	Land	Infra-structure	Buildings	Land	Infra-structure	Buildings	Land	Infra-structure
PAMPANGA	MABALACAT	CACUTUD	0.00	0.00	41.22	0.00	0.00	41.22	0.00	0.00	48.94
		DOLORES	0.00	19.15	452.73	0.00	20.01	452.73	0.00	23.30	603.64
		MAMATING	0.00	0.00	24.28	0.00	0.00	24.28	0.00	0.00	31.56
		SAN JOAQUIN	0.00	188.31	486.45	0.00	207.14	583.74	0.00	244.80	681.03
		SAPANBALEN	0.00	0.00	150.52	0.00	0.00	150.52	0.00	0.00	150.52
		STA INES	0.00	128.61	36.02	0.00	257.60	78.04	0.00	300.54	120.09
		TABUN	0.00	0.00	96.07	0.00	104.08	0.00	0.00	0.00	120.09
		MABALACAT	0.00	336.07	1,290.27	0.00	484.75	1,434.59	0.00	568.64	1,713.81
		MAUNLANG	0.00	1,067.54	2,414.04	0.00	1,001.13	2,414.04	0.00	1,114.91	2,414.04
		SAN AGUSTIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		SAN ROQUE	0.00	623.71	977.89	0.00	623.71	977.89	0.00	623.71	977.89
		STO ROSARIO	0.00	1,403.63	659.67	0.00	1,403.63	659.67	0.00	1,543.69	659.67
		TURU	0.00	3,699.94	3,430.36	0.00	3,699.94	3,430.36	0.00	3,699.94	2,744.29
		MAGALANG	0.00	6,774.61	7,481.96	0.00	6,808.48	7,481.96	0.00	6,982.54	6,795.89
		TABLAC	BAMBAN	BANABA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BIANGGI	0.00			14.39	56.86	0.00	15.42	36.86	0.00	16.44	39.94
LA PAL	0.00			123.29	0.00	0.00	123.29	0.00	0.00	123.29	0.00
LOURDES	0.00			3.61	0.00	0.00	3.61	0.00	0.00	3.61	0.00
MAJONES	0.00			0.00	20.89	0.00	20.89	0.00	0.00	20.89	0.00
PACALCAL	0.00			111.10	0.00	0.00	111.10	0.00	0.00	111.10	0.00
SAN NICOLAS (POB.)	0.00			0.01	45.11	0.00	0.01	43.23	0.00	0.01	60.15
SAN PEDRO	0.00			0.00	2.65	0.00	0.00	2.79	0.00	0.00	3.21
SAN VICENTE	0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STO. NIÑO	0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BAMBAN	0.00			252.46	185.52	0.00	255.33	315.26	0.00	254.46	124.19
CONCEPCION	0.00			0.00	22.01	0.00	0.03	22.01	0.00	0.03	0.00
CAFE	0.00			0.00	19.65	0.00	0.00	19.65	0.00	0.00	26.20
CAJUSGUECO	0.00			96.87	0.00	0.00	96.87	0.00	0.00	104.33	0.00
CASTILLO	0.00			898.39	0.00	0.00	898.89	0.00	0.00	898.89	0.00
CULATINGAN	0.00	0.00	133.05	0.00	0.00	133.05	0.00	0.00	133.05		
DUNCAN	0.00	254.97	49.76	0.00	254.97	49.76	0.00	254.97	49.76		
GREENVILLAGE	13,650.00	369.78	229.29	11,470.00	378.81	252.22	14,580.80	378.81	229.29		
LITRANGAN	0.00	13.82	0.00	0.00	13.82	0.00	0.00	13.82	0.00		
MAOAO	0.00	0.00	2.72	0.00	0.00	2.72	0.00	0.00	2.72		
MALUJA	34.00	0.00	0.00	45.50	0.00	0.00	95.60	0.00	0.00		
MINANE	15,451.54	482.57	1,355.08	17,270.46	503.97	1,355.08	20,186.94	524.97	1,490.59		
PANALICSICAN	0.00	3,741.77	1,969.83	0.00	3,840.24	1,969.83	0.00	4,037.18	1,969.83		
SAN ANTONIO	353.37	1,026.50	200.59	353.37	1,026.50	200.59	403.85	1,097.08	294.02		
SAN BARTOLOME	0.00	945.10	1,129.94	0.00	981.45	1,129.94	0.00	1,017.96	1,129.94		
SAN FRANCISCO	143.85	935.42	861.85	289.72	963.93	861.85	671.28	1,017.96	861.85		
SAN ISIDRO	0.00	2,105.13	2,105.50	0.00	2,105.13	2,105.50	0.00	2,255.50	2,105.50		
SAN JOSE (POB.)	18,970.03	261.79	196.50	19,873.36	267.37	211.40	19,873.36	267.37	196.50		
SAN MARTIN	0.00	3.57	0.01	0.00	3.57	0.01	0.00	3.56	0.01		
SAN NICOLAS (POB.)	3,284.40	122.69	494.71	3,284.40	122.69	494.71	3,284.40	122.69	494.71		
SAN NICOLAS BALAS	1,162.81	967.50	1,355.71	1,242.09	967.50	1,355.71	1,738.74	997.53	1,355.71		
SAN VICENTE	0.00	51.64	54.84	0.00	51.64	54.84	0.00	51.64	54.84		
STA MONICA	0.00	0.00	40.90	0.00	0.00	40.90	0.00	0.00	40.90		
STA RITA	2,133.44	36.15	26.97	2,438.21	36.15	26.97	2,661.80	37.96	40.90		
STO CRISTO	26.97	0.00	61.65	26.97	0.00	61.65	26.97	0.00	61.65		
TALIM, MARIMLA	0.00	42.01	0.00	0.00	44.56	0.00	0.00	48.38	0.00		
TALIM, SAN MIGUEL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
TELADANCA	0.00	239.00	190.60	0.00	245.68	190.60	0.00	258.96	209.66		
CONCEPCION	55,215.46	12,596.25	19,655.95	60,244.08	12,680.56	19,655.95	63,540.46	13,390.40	18,650.50		
Total	55,215.46	19,959.23	19,333.70	63,264.08	20,351.74	19,759.21	63,540.46	21,196.44	19,384.38		

Table E.1 Summary of Barangay Data Base in Sacobia/Baraban River Basin

Province	Municipality	Barangay	Flood Damages by Return Period (x1000 pesos)			Flood Damages by Return Period (x1000 pesos)			Flood Damages by Return Period (x1000 pesos)			Affected Area (sq.kms.)		
			20 years			50 years			100 years			20 years	50 years	100 years
			Buildings	Land	Infra-structure	Buildings	Land	Infra-structure	Buildings	Land	Infra-structure	Buildings	Land	Infra-structure
PAMPUNIA	MABALACAT	CACUTUD	0.00	0.00	48.94	0.00	0.00	54.10	0.00	0.00	54.10	0.00	0.00	1.63
		DOLORES	0.00	25.24	704.23	0.00	27.85	804.83	0.00	35.68	955.76	0.57	2.72	2.72
		MAMATINGANG	0.00	0.00	31.36	0.00	0.00	36.42	0.00	36.84	0.00	0.00	0.00	0.09
		SAN JOAQUIN	0.00	244.80	778.32	0.00	263.63	778.32	0.00	320.13	972.89	0.19	0.72	0.72
		SAPANGBALEN	0.00	0.00	150.52	0.00	343.09	180.62	0.00	190.62	0.00	0.00	0.14	4.53
		STA. INES	0.00	300.54	78.04	0.00	117.06	0.00	424.93	0.00	117.06	0.00	0.23	3.64
		TABUN	0.00	0.00	136.10	0.00	152.11	0.00	176.13	0.00	176.13	1.11	3.64	3.64
		MABALACAT	0.00	378.58	1,927.72	0.00	634.57	2,124.47	0.00	784.76	2,495.40	2.01	13.56	13.56
		MAGALANONG	0.00	1,148.70	1,434.04	0.00	1,250.05	2,414.04	5,103.10	2,229.82	3,486.95	0.70	4.10	4.10
		MAGALANONG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43
TARLAC	MAGALANG BAMBAN	SAN AGUSTIN	0.00	623.70	977.89	13.00	623.71	977.89	404.30	891.01	488.95	0.09	1.50	1.50
		STO. ROSARIO	0.00	1,543.99	659.67	0.00	1,684.35	659.67	2,386.16	659.67	2,386.16	0.41	2.87	2.87
		TURU	0.00	3,699.94	2,744.29	0.00	3,931.18	2,744.29	6,012.40	2,058.22	3,34	14.34	14.34	
		BANABA	0.00	7,916.33	6,795.89	13.00	7,489.29	6,795.89	11,519.40	6,693.78	4.61	25.24	25.24	
		BANGCU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
		LA PAZ	0.00	18.30	55.30	0.00	19.87	64.51	0.00	24.67	86.02	1.11	1.91	1.91
		LOURDES	0.00	158.32	0.00	0.00	159.52	0.00	211.36	0.00	211.36	0.10	0.41	0.41
		MALONZO	0.00	3.61	0.00	0.00	3.41	0.00	5.41	0.00	5.41	0.00	0.00	0.13
		PACALCAL	0.00	0.00	20.89	0.00	0.00	27.86	0.00	0.00	34.82	0.27	1.31	1.31
		SAN NICOLAS (POB.)	0.00	111.10	0.00	0.00	111.10	0.00	183.16	0.00	183.16	0.00	0.01	0.47
BAMBAN	CONCEPCION	SAN PEDRO	0.00	0.00	3.07	0.00	0.00	3.90	0.00	4.18	1.18	3.44	3.44	
		SAN VICENTE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		STO. NINO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		BALUTU	0.00	291.74	14,37	0.00	294.91	36,237	0.00	424.62	190,81	3.26	9.14	9.14
		CAPE	0.00	0.00	22.61	46.80	0.00	22.61	162.50	0.04	29.34	0.30	0.82	0.82
		CALUIS GURCO	0.00	115.30	0.00	0.00	141.59	0.00	182.57	0.00	193.65	1.68	3.24	3.24
		CASTILLO	0.00	898.89	0.00	0.00	1,378.30	0.00	1,797.78	0.00	14.83	17.64	17.64	
		CULATINGAN	0.00	0.00	114.04	0.00	0.00	76.03	0.00	0.00	57.02	2.67	5.72	5.72
		DUNGAN	0.00	254.97	49.76	0.00	254.97	49.76	389.96	0.00	0.00	0.00	0.00	0.79
		GREEN VILLAGE	15,668.90	396.85	252.22	16,390.60	396.85	252.22	25,026.50	487.04	34,393	0.51	0.64	0.64
MAGALANG BAMBAN	CONCEPCION	LILIBANGAN	0.00	13.82	0.00	0.00	16.38	0.00	21.18	0.00	0.65	1.55	1.55	
		MAGAO	38.00	0.00	2.17	171.60	0.00	1.43	2,047.01	0.00	2.17	3.44	3.44	
		MALUPA	93.60	0.00	0.00	145.60	0.00	0.00	366.60	0.00	0.00	0.45	0.97	
		MINANE	22,245.19	577.46	1,490.59	21,059.66	598.46	1,490.59	18,178.59	600.96	1,335.08	1.97	2.83	2.83
		PANALICSIAN	0.00	4,332.58	1,969.83	0.00	5,317.25	2,462.28	6,006.53	2,462.28	6.31	9.26	9.26	
		SAN ANTONIO	466.20	1,203.25	234.02	599.14	1,344.80	267.45	5,005.66	1,698.70	2,674.5	1.75	3.32	3.32
		SAN BARTOLOME	0.00	1,054.15	1,291.36	0.00	1,163.20	1,291.36	853.40	1,812.51	1,452.78	0.88	3.85	3.85
		SAN FRANCISCO	1,640.91	1,100.50	948.03	4,643.03	1,234.06	861.85	7,645.15	1,513.18	775.66	1.13	2.85	2.85
		SAN ISIDRO	2,330.68	2,105.50	2,105.50	2,330.68	2,105.50	2,105.50	3,232.88	2,105.50	2,105.50	2.19	5.73	5.73
		SAN JOSE (POB.)	21,680.03	2,673.37	211.40	19,873.36	272.94	211.40	28,000.38	399.78	25,609	0.50	0.50	0.50
MAGALANG BAMBAN	CONCEPCION	SAN MARTIN	0.00	3.96	0.01	0.00	4.36	0.01	5.53	0.01	0.40	0.68	0.68	
		SAN NICOLAS (POB.)	4,456.49	1,239.49	494.71	5,495.47	1,363.31	494.71	71,444.12	149.94	395.77	1.37	5.69	5.69
		SAN NICOLAS BALAS	2,805.27	1,506.34	3,599.41	3,599.41	1,209.12	1,306.34	13,742.25	1,964.83	2,410.15	1.37	5.69	5.69
		SAN VICENTE	51.64	36.94	36.94	36.94	52.64	36.94	1,015.31	80.72	36.94	0.00	0.00	0.00
		STA. MONICA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		STA. RITA	3,126.29	41.38	49.08	3,617.59	43.38	49.08	4,253.68	50.61	40,901	0.70	1.28	1.28
		STO. CRISTO	13.48	0.00	30.82	20.22	30.82	79.55	0.00	30.82	30.82	0.01	0.11	0.11
		TALIM, MARIMA	0.00	53.93	0.00	0.00	63.66	0.00	75.12	0.00	0.00	2.32	4.00	4.00
		TALIM, SAN MIGUEL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		TELANCANCA	278.88	29.66	0.00	0.00	325.37	228.72	0.00	418.32	381.19	4.09	7.76	7.76
CONCEPCION	72,255.45	14,191.74	11,044.58	75,898.74	16,531.41	11,765.56	115,559.40	20,833.19	17,463.74	48.29	88.13	88.13		
Total	72,255.45	22,076.19	19,892.55	75,911.74	24,932.88	21,047.18	119,069.21	33,563.97	31,803.23	58.16	134.06	134.06		

Table E.1 Summary of Barangay Data Base in Sacobia/Samban River Basin

Province	Municipality	Barangay	Evacuation and Clean-up Cost							Loss of CRDP								
			2 years	5 years	10 years	20 years	50 years	100 years	2 years	5 years	10 years	20 years	50 years	100 years				
PAMPANOA	MABALACAT	CACUTUD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		DOLORES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		MANATTIANG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		SAN JOAQUIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		SAN JOSE (POB)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MABALACAT	TABUN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		MABALACAT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		NAVILING	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		SAN AGUSTIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		SAN ROQUE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		STO. ROSARIO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TABLAC	MAGALANG	TURU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		MAGALANG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		BAMBAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	BAMBAN	BANABA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		BANGCU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		LA PAZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		LOURDES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		MALONZO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		PACALCAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		SAN NICOLAS (POB)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		SAN PEDRO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONCEPCION	SAN VICENTE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	STO. NIÑO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
BAMBAN	CONCEPCION	BALUTU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		CAYE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		CALLUS GUECO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		CASTILLO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		CULATINGAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		DUNGAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		GREEN VILLAGE	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.12	2.12	2.12	2.12
		LILIBANGAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		MAGAO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		MALUJA	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
		MAGAO	MINANE	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.28	3.28	3.28
	PANALISICAN		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SAN ANTONIO		0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.11	0.11	0.11	0.11
	SAN BARTOLOME		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SAN FRANCISCO		0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
	SAN ISIDRO		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SAN JOSE (POB)		1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.26	1.26	1.26	1.26
	SAN MARTIN		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SAN NICOLAS (POB)		0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.46	0.46	0.46	0.46
	SAN NICOLAS BALAS		0.32	0.34	0.34	0.44	0.69	0.82	1.44	0.27	0.28	0.28	0.28	0.28	0.37	0.37	0.37	0.37
	SAN VICENTE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	STA. MONICA		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	STA. RITA		0.82	0.82	0.82	0.90	0.94	1.09	1.44	0.69	0.69	0.69	0.69	0.69	0.76	0.76	0.76	0.76
	STO. CRISTO		0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03
	TALIM, MABRILA		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TALIM, SAN MIGUEL		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TELABANCA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CONCEPCION	Total	9.75	9.89	10.16	10.16	10.89	12.27	17.80	8.18	8.30	8.53	9.14	10.30	14.94	14.94	14.94	14.94	
	Total	5.75	5.89	6.16	6.16	6.89	8.27	12.27	5.18	5.30	5.53	6.14	7.30	10.30	10.30	10.30	10.30	

**Table E.2 Unit Values of Damageable Properties applied for Project Evaluation**

Items	Unit Value
<b>I. Direct Damage</b>	
1. Buildings*	
1) Residential Buildings	51,000 Pesos/building
2) Non-Residential	265,000 Pesos/building
3) Household effects	14,000 Pesos/building
4) Inventory stock/equipment	143,000 Pesos/building
2. Agricultural Crops	
Paddy	10,650 Pesos/ha
Upland Crops	9,810 Pesos/ha
Sugar Cane	17,740 Pesos/ha
Fruit Trees	20,930 Pesos/ha
5) Livestock	(estimated by 7% of crop damage)
3. Infrastructure	
6) Road	
National Road	1,750 Pesos/m
Other Roads	1,400 Pesos/m
7) Bridge	
National Bridge	60,000 Pesos/m
Local Bridge	50,000 Pesos/m
8) Irrigation System	
	640 Pesos/m
<b>II. Indirect Damage</b>	
9) Additional Transportation Cost	(c.f. Tables 10.4 and 10.5)
10) Interruption of Economic Activity	(c.f. Table 10.6)
11) Evacuation Cost	216 Pesos/family/week
12) Emergency Clean-up Cost	150 Pesos/day/building

**Basic Source of Data:**

- "Study of Agno River Basin Flood Control" Final Report Vol.V, Supporting Report Part II Feasibility Study, Dec. 1991
- "Mount Pinatubo Recovery Action Plan , Long Term Report" Technical Appendix C Economic Analysis, March 1994
- "Capital Outlays, Average Unit Cost" DPWH, December 1990

- Interview at the Site

Note:

\* Values assumed as those after depreciated by 50%.

**Table E.3 No. of Buildings Located in Probable Flood Areas in Sacobia/Bamban  
Sacobia/Bamban River (1/3)**

Sheet No.	Barangays	Return Period of Flood					
		2 Years	5 years	10 years	20 years	50 years	100 years
<b>CONCEPCION</b>							
2	Sto. Cristo 2316039	0	0	0	0	0	14
	San Jose (Poblacion) 2316027	418	418	418	418	418	418
	Green Village 2316011	700	700	701	709	709	713
	San Nicolas (Poblacion) 2316030	153	153	153	173	256	389
	Alfonso 2316001	0	0	0	0	0	93
	Minane 2316016	1,058	1,084	1,086	1,118	1,133	1,141
	Sta. Rita 2316037	229	229	250	261	302	400
	San Francisco 2316025	4	4	17	46	185	341
	<b>Total</b>	<b>2,562</b>	<b>2,588</b>	<b>2,625</b>	<b>2,725</b>	<b>3,003</b>	<b>3,509</b>
<b>CONCEPCION</b>							
3	Malupa 2316015	5	5	9	9	14	47
	Sto. Cristo 2316039	10	10	10	10	15	45
	Magao 2316014	0	0	0	0	0	147
	Balota 2316002	0	0	0	0	9	25
	<b>Total</b>	<b>15</b>	<b>15</b>	<b>19</b>	<b>19</b>	<b>38</b>	<b>264</b>
<b>CONCEPCION</b>							
4	Magao 2316014	0	0	0	6	27	138
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>27</b>	<b>138</b>

**Table E.3 No. of Buildings Located in Probable Flood Areas in Sacobia/Bamban  
Sacobia/Bamban River (2/3)**

Sheet No.	Barangays	Return Period of Flood					
		2 Years	5 years	10 years	20 years	50 years	100 years
<b>BAMBAN</b>							
6	San Nicolas (Poblacion) 2317010	0	0	0	0	0	27
	<b>Total</b>	0	0	0	0	0	27
<b>CONCEPCION</b>							
7	Malonzo (Bamban) 2317003	0	0	0	13	24	22
	Bangcu 2317003	0	0	0	0	2	30
	Telabanga 2316044	17	10	2	9	14	30
	<b>Total</b>	17	10	2	22	40	82
<b>CONCEPCION</b>							
8	San Nicolas Bajas 2316031	88	6	27	72	34	173
	San Vicente 2316032	0	0	0	0	2	63
	San Antonio 2316023	38	0	0	1	2	273
	San Bartolome 2316024	0	0	0	0	0	47
	Dungan (Macangoong) 2316009	0	0	0	0	0	7
	Telabanga 2316044	196	4	12	13	57	3
	San Francisco 2316025	5	6	8	23	22	169
	<b>Sub-Total</b>	327	16	47	109	117	735
			343	390	499	616	1,351



**Table E.3 No. of Buildings Located in Probable Flood Areas in Sacobia/Bamban  
Sacobia/Bamban River (3/3)**

Sheet No.	Barangays	Return Period of Flood					
		2 Years	5 years	10 years	20 years	50 years	100 years
<b>MAGALANG</b>							
8	San Roque	0	0	0	0	5	306
	2011020		0	0	0	5	311
	San Navaling	0	0	0	0	0	187
	2011007		0	0	0	0	187
	Sub-Total	0	0	0	0	5	493
			0	0	0	5	498
	<b>Total</b>	<b>327</b>	<b>16</b>	<b>47</b>	<b>109</b>	<b>122</b>	<b>1,228</b>
			<b>343</b>	<b>390</b>	<b>499</b>	<b>621</b>	<b>1,849</b>
	<b>Grand Total</b>	<b>2,921</b>	<b>52</b>	<b>90</b>	<b>237</b>	<b>486</b>	<b>2,207</b>
			<b>2,973</b>	<b>3,063</b>	<b>3,300</b>	<b>3,786</b>	<b>5,993</b>

**Table E.4 Probable Flood Damage for each Flood Return Period for Sacobia / Bamban Rivers**

Return Period	Unit: Pesos 10 <sup>3</sup>			Total
	Buildings	Crops & Livestock	Infrastructure	
2 years	55,215	21,356	19,334	95,905
5	60,264	21,776	19,759	101,800
10	63,541	22,680	19,284	105,506
20	72,255	23,615	19,893	115,763
50	75,912	26,678	21,047	123,637
100	119,069	35,913	21,893	176,785

**Table E.5 Estimated Average Annual Damage under without-Project Conditions for Sacobia / Bamban Rivers**

(A)	(B)	(C)	(D)	(E)	(F)	(G)
Return Period	Average Annual Probability of Exceedance for Return Period	Events within Intervals	Flood Damage up to Indicated Return Period (Pesos 10 <sup>6</sup> )	Average Flood Damage (Pesos 10 <sup>6</sup> )	Flood Damage within Intervals (Pesos 10 <sup>6</sup> )	Average Annual Flood Damage up to Indicated Return Period (Pesos 10 <sup>6</sup> )
2	0.5		85.91			0.03
		0.3		146.81	44.04	44.04
5	0.2		197.71			44.04
		0.1		250.46	25.05	69.09
10	0.1		303.21			69.09
		0.05		361.09	18.05	87.14
20	0.05		418.97			87.14
		0.03		480.79	14.42	101.57
50	0.02		542.61			101.57
		0.01		631.00	6.31	107.88
100	0.01		719.40			107.88

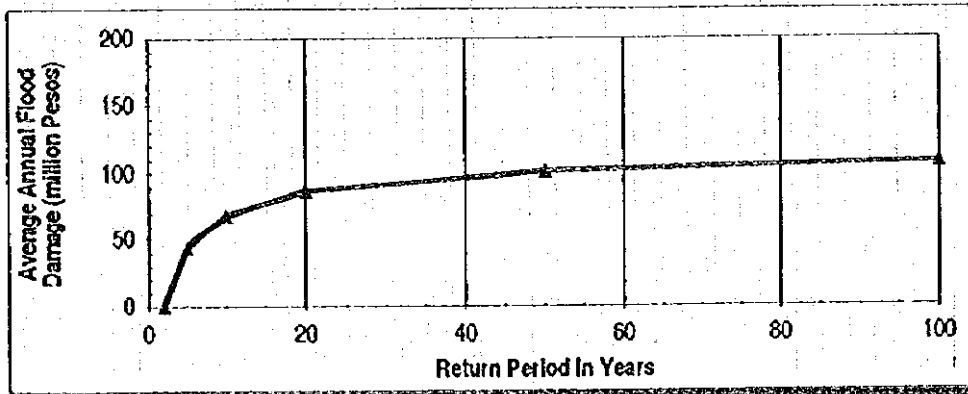


Table E.6 Summary of Traffic Counting on Magaiang-Tarlac Road

Station No. 1 Mabalacat

DATE	ROUTE	CAR, TAXI, VAN PICK-UP	JERNEY	SMALL BUS	BIG BUS	RIGID TRUCK	ARTICULATED TRUCK	TOTAL
1995/7/16	Dau-Tarlac	616	530	4	513	137	35	1,835
	Tarlac-Dau	710	553	2	557	156	21	1,989
1995/7/17	Dau-Tarlac	537	443	9	471	288	65	1,813
	Tarlac-Dau	566	494	4	479	364	16	1,923
1995/7/18	Dau-Tarlac	558	447	17	439	333	15	1,809
	Tarlac-Dau	625	470	5	499	399	26	2,024
1995/7/19	Dau-Tarlac	541	440	9	491	514	13	2,008
	Tarlac-Dau	550	465	8	506	402	16	1,947
1995/7/20	Dau-Tarlac	520	407	8	486	414	25	1,860
	Tarlac-Dau	568	455	9	515	444	11	2,002
1995/7/21	Dau-Tarlac	445	421	6	516	403	11	1,802
	Tarlac-Dau	530	483	4	499	406	17	1,939
1995/7/22	Dau-Tarlac	585	428	1	535	410	17	1,976
	Tarlac-Dau	684	537	2	621	486	22	2,352
1995/7/23	Dau-Tarlac	628	557	21	624	177	6	2,013
	Tarlac-Dau	709	617	37	987	793	42	3,185
Total Dau-Tarlac		4,430 (6,645)	3,673 (5,510)	75 (113)	4,075 (6,113)	2,976 (4,014)	187 (281)	15,116 (22,674)
Total Tarlac-Dau		4,942 (7,413)	4,074 (6,111)	71 (107)	4,663 (6,995)	3,450 (5,175)	161 (242)	17,361 (25,042)
Daily Ave. Dau-Tarlac		554 (831)	459 (689)	9 (14)	509 (764)	335 (502)	23 (35)	1,890 (2,834)
Daily Ave. Tarlac-Dau		618 (927)	509 (764)	9 (13)	583 (874)	431 (647)	20 (30)	2,170 (3,255)
Daily Average Total		1,172 (1,757)	968 (1,453)	18 (27)	1,092 (1,638)	766 (1,149)	44 (65)	4,060 (6,089)

Note: (i) Traffic volume of 12 hours for the period from July 16 to July 23, 1995.

(ii) Figures in parentheses show the traffic volume converted to 24 hours.

(iii) Points of survey station are shown in Figure \_\_\_\_

Source: JICA Study Team Survey

Table E.6 Summary of Traffic Counting on Magalang-Tarlac Road  
Station No. 2 Magalang

DATE	ROUTE	CAR, TAXI, VAN PICK-UP	JEEPNEY	SMALL BUS	BIG BUS	RIGID TRUCK	ARTICULATED TRUCK	TOTAL
1995/7/16	Dau-Tarlac	1,790	598	1	560	213	16	3,178
	Tarlac-Dau	2,864	856	21	612	342	20	4,715
1995/7/17	Dau-Tarlac	1,426	450	5	455	479	52	2,867
	Tarlac-Dau	1,580	601	7	502	477	44	3,211
1995/7/18	Dau-Tarlac	1,606	468	10	444	503	38	3,069
	Tarlac-Dau	1,531	545	12	488	534	53	3,163
1995/7/19	Dau-Tarlac	1,746	509	11	511	495	39	3,312
	Tarlac-Dau	1,748	618	11	500	502	51	3,430
1995/7/20	Dau-Tarlac	1,632	432	6	466	485	44	3,065
	Tarlac-Dau	1,617	532	5	490	529	53	3,226
1995/7/21	Dau-Tarlac	1,888	529	11	543	517	37	3,525
	Tarlac-Dau	1,645	568	6	472	491	46	3,228
1995/7/22	Dau-Tarlac	2,355	795	10	593	523	46	4,322
	Tarlac-Dau	2,017	690	7	586	591	44	3,935
1995/7/23	Dau-Tarlac	1,932	823	25	636	201	11	3,628
	Tarlac-Dau	2,607	812	22	646	319	15	4,421
	Total Dau-Tarlac	14,375 (21,563)	4,604 (6,906)	79 (119)	4,208 (6,312)	3,416 (5,124)	283 (425)	26,965 (40,448)
	Total Tarlac-Dau	15,609 (23,414)	5,222 (7,833)	91 (137)	4,296 (6,444)	3,785 (5,678)	326 (489)	29,329 (43,994)
	Daily Ave. Dau-Tarlac	1,797 (2,695)	576 (863)	10 (15)	526 (789)	427 (641)	35 (53)	3,371 (5,056)
	Daily Ave. Tarlac-Dau	1,951 (2,927)	653 (979)	11 (17)	537 (806)	473 (710)	41 (61)	3,666 (5,499)
	Daily Average Total	3,748 (5,622)	1,228 (1,842)	21 (32)	1,063 (1,595)	900 (1,350)	76 (116)	7,037 (10,555)

Note: (i) Traffic volume of 12 hours for the period from July 16 to July 23, 1995.

(ii) Figures in parentheses show the traffic volume converted to 24 hours.

(iii) Points of survey station are shown in Figure \_\_\_\_.

Source: JICA Study Team Survey

Table E.6 Summary of Traffic Counting on Magalang-Tarlac Road

Station No. 3 Capas

DATE	ROUTE	CAR, TAXI, VAN PICK-UP	JEEPNEY	SMALL BUS	BIG BUS	RIGID TRUCK	ARTICULATED TRUCK	TOTAL
1995/7/16	Dau-Tarlac	1,306	657	45	622	258	18	2,906
	Tarlac-Dau	4,085	651	44	689	359	20	5,848
1995/7/17	Dau-Tarlac	1,168	702	51	599	553	53	3,126
	Tarlac-Dau	2,257	608	37	549	559	52	4,062
1995/7/18	Dau-Tarlac	1,573	686	42	565	469	50	3,390
	Tarlac-Dau	1,859	543	31	481	627	59	3,600
1995/7/19	Dau-Tarlac	1,578	632	46	540	497	55	3,348
	Tarlac-Dau	1,435	629	24	495	565	51	3,199
1995/7/20	Dau-Tarlac	1,236	744	48	552	486	38	3,104
	Tarlac-Dau	1,450	522	39	474	582	42	3,109
1995/7/21	Dau-Tarlac	1,142	846	46	577	499	39	3,149
	Tarlac-Dau	1,542	505	36	496	548	44	3,171
1995/7/22	Dau-Tarlac	1,662	947	54	585	491	49	3,788
	Tarlac-Dau	1,843	638	43	596	662	46	3,828
1995/7/23	Dau-Tarlac	1,613	846	47	635	199	13	3,353
	Tarlac-Dau	2,916	734	47	669	333	19	4,718
Total Dau-Tarlac		11,283 (16,925)	6,060 (9,090)	379 (569)	4,675 (7,013)	3,452 (5,178)	315 (473)	26,164 (39,246)
Total Tarlac-Dau		17,387 (26,081)	4,830 (7,245)	301 (452)	4,449 (6,674)	4,235 (6,353)	333 (500)	31,535 (47,303)
Daily Ave. Dau-Tarlac		1,410 (2,116)	758 (1,136)	47 (71)	584 (877)	432 (647)	39 (59)	3,271 (4,906)
Daily Ave. Tarlac-Dau		2,173 (3,260)	604 (906)	38 (56)	556 (834)	529 (794)	42 (62)	3,942 (5,913)
Daily Average Total		3,584 (5,376)	1,361 (2,042)	85 (128)	1,141 (1,711)	961 (1,441)	81 (122)	7,212 (10,819)

Note: (i) Traffic volume of 12 hours for the period from July 16 to July 23, 1995.

(ii) Figures in parentheses show the traffic volume converted to 24 hours.

(iii) Points of survey station are shown in Figure \_\_\_\_\_

Source: JICA Study Team Survey

Table E7 Summary of Traffic Data on North Luzon Expressway on July 16-23, 1995

(1) NORTH BOUND TRAFFIC

EXIT	ETA, TRKS	DAU	ANGULUS	SAN PANGAN	SAN BAGO	PULAJAN	ETA BTA	DABONO	BOCAUS	ARICAUAYAN	VALANGURA	MALINTANWAK	TOTAL
ENTRY STA, TRKS													
DAU	(972) 3,755												(972) 3,755
ANGULUS	(80) 699	(229) 2,087											(80) 699
SAN PANGAN	(603) 3,001	(607) 4,894	(603) 3,724										(603) 3,001
SAN BAGO	(102) 825	(130) 814	(130) 1,096	(165) 13,693									(102) 825
PULAJAN	(103) 814	(24) 48	(24) 42	(115) 4,304	(115) 915								(103) 814
ETA BTA	(409) 797	(40) 333	(40) 376	(40) 2,897	(40) 388	(40) 751							(409) 797
BOCAUS	(404) 3,153	(64) 466	(64) 488	(65) 3,380	(64) 79	(64) 988	(64) 4,988	(64) 8,692					(404) 3,153
ARICAUAYAN	(90) 718	(49) 351	(49) 325	(49) 2,481	(49) 69	(49) 541	(49) 3,041	(49) 5,987	(49) 11,785				(90) 718
VALANGURA	(240) 3,276	(68) 477	(68) 567	(68) 2,853	(68) 70	(68) 498	(68) 2,148	(68) 3,479	(68) 6,549	(68) 34,454			(240) 3,276
MALINTANWAK	(289) 34,311	(173) 2,897	(173) 6,378	(173) 40,488	(173) 11,200	(173) 5,490	(173) 34,927	(173) 61,212	(173) 51,402	(173) 37,794	(173) 92,389		(289) 34,311
TOTAL	(3940) 31,519	(640) 23,744	(640) 13,100	(640) 22,296	(640) 14,645	(640) 6,486	(640) 45,924	(640) 91,118	(640) 89,294	(640) 72,241	(640) 93,394	(640) 18,153	(3940) 31,519

Note: (1) Total number of Cars/Trucks/Jeepneys, (2) Total Buses, (3) Total Public Buses and Articulated Trucks.

(4) Traffic volume of 24 lanes for one period from July 16 to 23, 1995.

(5) Figures in parentheses show daily average values.

(6) Figures at the bottom of "Total" show percentage to the total.

Source: FNOC-NLTD Control Center.

Table E-7. Summary of Traffic Data on North Luzon Expressway on July 16-23, 1966

(2) SOUTH ROUND TRAFFIC

	PCBT	STA 3063	DAU	ANGULIS	SAN FERNANDO	SAN EDROK	PULUAN	STA RTA	BOCAIE	MEYCAVAYAN	VALDEZUELA	BALICATAWAK	TOTAL
OPVY STA WES		(140) 3,174	(97) 2,079	(107) 2,372	(91) 2,072	(113) 2,544	(88) 2,014	(87) 2,014	(112) 2,544	(101) 2,372	(140) 3,174	(907) 2,079	(600) 1,365
DAU		(246) 5,679	(205) 4,642	(205) 4,642	(192) 4,362	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642
ANGULIS		(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642
SAN FERNANDO		(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642
SAN EDROK		(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642
PULUAN		(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642
STA RTA		(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642
TABANG		(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642
BOCAIE		(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642
MEYCAVAYAN		(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642
VALDEZUELA		(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642	(205) 4,642
TOTAL		(600) 1,365	(600) 1,365	(600) 1,365	(600) 1,365	(600) 1,365	(600) 1,365	(600) 1,365	(600) 1,365	(600) 1,365	(600) 1,365	(600) 1,365	(600) 1,365

Note: (i) Total number of Caisipriana, Hapara, Tourist Buses, Trucks, Public Buses and Accumulated Trucks.  
 (ii) Traffic volume of 24 hours for the period from July 16 to 23, 1966.  
 (iii) Figures in parentheses show daily average values.  
 (iv) Figures at the bottom of "Total" show percentages to the total.  
 Source: TRACC-NLTD Consultants.

**Table E.8 Traffic Counting Survey at Three Stations at Magalang-Tarlac Road on July 19, 1995**

Unit : Number of vehicles

Station No. 1 (Magalang)	Dau-Tarlac			Tarlac-Dau			Total		
	7:00-19:00	19:00-7:00	Total	7:00-19:00	19:00-7:00	Total	7:00-19:00	19:00-7:00	Total
1) Car, Taxi, Van, Jeep	541	219	760	550	162	712	1091	381	1472
2) Jeepney	440	193	633	465	189	654	905	382	1287
3) Small Bus	9	2	11	8	11	19	17	13	30
4) Big Bus	491	241	732	506	242	748	997	483	1480
5) Rigid Truck	514	240	754	402	265	667	916	505	1421
6) Articulated Truck	13	27	40	16	20	36	29	47	76
7) Total	2008	922	2930	1947	889	2836	3955 100	1811 45.8%	5766 145.8%

Station No. 2 (Magalang)	Dau-Tarlac			Tarlac-Dau			Total		
	7:00-19:00	19:00-7:00	Total	7:00-19:00	19:00-7:00	Total	7:00-19:00	19:00-7:00	Total
1) Car, Taxi, Van, Jeep	1746	679	2425	1748	652	2400	3494	1331	4825
2) Jeepney	509	424	933	618	337	955	1127	761	1888
3) Small Bus	11	8	19	11	12	23	22	20	42
4) Big Bus	511	293	804	500	274	774	1011	567	1578
5) Rigid Truck	495	539	1034	502	463	965	997	1002	1999
6) Articulated Truck	39	83	122	51	53	104	90	136	226
7) Total	3311	2026	5337	3430	1791	5221	6741 100	3817 56.6%	10558 156.6%

Station No. 3 (Capas)	Dau-Tarlac			Tarlac-Dau			Total		
	7:00-19:00	19:00-7:00	Total	7:00-19:00	19:00-7:00	Total	7:00-19:00	19:00-7:00	Total
1) Car, Taxi, Van, Jeep	1578	602	2180	1435	527	1962	3013	1129	4142
2) Jeepney	632	284	916	629	262	891	1261	546	1807
3) Small Bus	46	11	57	24	18	42	70	29	99
4) Big Bus	540	294	834	495	263	758	1035	557	1592
5) Rigid Truck	497	437	934	565	400	965	1062	637	1899
6) Articulated Truck	55	91	146	51	52	103	106	143	249
7) Total	3348	1719	5067	3199	1522	4721	6547 100	3241 49.5%	9788 149.5%

Source : JICA Study Team Survey

Notes : 1) Time of survey: 7:00-19:00 and 19:00-7:00 on July 19, 1995.

2) Site of survey : Three Stations shown in Figure ---.



Table E.9 Traffic Data in the Study Area

Road Section	Data Source	A Node	B Node	Car	Jeepney	Bus	Truck	Total	PCU	Others
1) CLDP Data										
Mabalacat-Bamban(MNR)	LISR	3401	3535	6554	1874	1807	1629	11854	16237	0 1992
San Fernando-Angeles(MNR)	NTCP87	3428	3429	6793	6577	3900	1973	21243	31405	0 1987
Bamban-Capas	NTCP87	3532	3535	3855	1291	1755	1269	8170	11840	105 1937
Angeles-San Fernando	ALT93	3437	3439	8197	0	2090	3094	13381	18565	0 1993
2) LISR Data										
San Fernando-Mabalacat(NLE)				11340	5873	2280	3096	22589		1992
Mabalacat-Capas				5066	1467	1104	2010	9647		1992
3) DPWH Data										
Mabalacat-Bamban	DPWH Angeles			1231	728	117	922	2998		225 Nov.19,94
Mabalacat-Concepcion	ditto			2401	4223	839	684	8197*		Nov.7-13,94
								(10929)		Daily average
4) Angeles-San Fernando(MNR)										
	Kampear In'it			12909	638	163	1379	15089		213 Nov.14,92
ditto				13225	685	190	1562	15562		249 Nov.13,92
5) San Francisco Bridge(#329)										
	JICA			3603	1805	1196	1080	7684*		Aug 21-28,94
								(10245)		Daily average

Note :

- \* : 12 hrs survey data which was adjusted to 24 hrs data and is shown in the parentheses of the down column.
- LISR: Luzon Island Strategic Road Development Study, JICA, July 1993
- NTCP: National Traffic Count Program, DPWH
- ALT93: Feasibility Study of the Proposed Alternate Arterial Roads in Central Luzon, 1994

**Table E.10 DPWH Traffic Counting Survey In November 1994**

	Unit : Number of vehicles							Total	Daily Aver.
	Mon. Nov 7	Tue. Nov 8	Wed. Nov 9	Thu. Nov 10*	Fri. Nov 11	Sat. Nov 12	Sun. Nov 13		
1) Car, Taxi, Van, Jeep	2623 (34.8)	2151 (27.5)	2292 (27.6)	2450 (28.3)	2373 (27.7)	2416 (28.5)	2504 (31.3)	16309 (29.3)	2401
2) Jeepney	3542 (47.0)	4248 (54.2)	4419 (53.3)	4487 (51.8)	4457 (52.0)	4436 (52.3)	3974 (49.7)	29563 (51.5)	4223
3) Small Bus	115 (1.5)	72 (0.9)	61 (0.7)	84 (1.0)	83 (1.0)	79 (0.9)	91 (1.1)	585 (1.0)	84
4) Big Bus	711 (9.4)	764 (9.8)	848 (10.2)	868 (10.0)	664 (10.1)	833 (9.8)	745 (9.3)	5833 (9.8)	805
5) Rigid Truck	442 (5.9)	536 (6.8)	607 (7.3)	692 (8.0)	708 (8.3)	635 (7.5)	598 (7.5)	4218 (7.4)	603
6) Articulated Truck	107 (1.4)	63 (0.8)	69 (0.8)	74 (0.9)	87 (1.0)	77 (0.9)	92 (1.1)	569 (1.0)	81
7) Total	7540 (100)	7834 (100)	8296 (100)	8655 (100)	8572 (100)	8478 (100)	8004 (100)	57377 (100)	8197 (100)

Source : DPWH-PDES0 Angeles

Notes: 1) Time of survey: 7:00 a.m. - 19:00 p.m. from November 7 to November 13, 1994.

2) Site of survey: Station No. 021 in Mababacal Municipality in Pampanga.

3) \*: Original data covering 24 hrs. was adjusted to 12 hrs. survey in this table.

Table E.11 Detour Cost Computation

Unit : Peso thousand

Normal Route		Dry/Rainy Season : 11 months				Flooding Period : 30 days in total			
Route	Vehicle Bridg (km)	Route	Vehicle Bridg (km)	Detour Cost	Route	Vehicle Hwy (km)	Detour Cost		
N.1	MLL-N-B-TLC 6000 B	87.6 D.1 MLL-N-S-TLC 6000 S	91.3	24952	R.1 MLL-F-TLC 6000 F	112.0	14959		
N.2	MLL-B-TLC 2500 B	86.5 D.2 MLL-F-TLC 2500 F	111.6	70530	R.2 MLL-F-TLC 2500 F	111.6	6412		
N.3	S/F-B-TLC 2000 B	57.5 D.3 S/F-S-TLC 2000 S	62.3	10790	R.3.1 S/F-F-TLC 1500 F	136.6	16165		
N.4	S/F-S-CC 500 S	44.3 D.4 S/F-S-CC 500 S	44.3	0	R.3.2 S/F-F-LPZ-CC-CPS 500 F	147.8	4613		
N.5	AGL-B-TLC 2000 B	39.7 D.5.1 AGL-S-TLC 1500 S	44.5	8093	R.4 S/F-F-CC 500 F	149.0	5349		
		D.5.2 AGL-S-CC-CPS-BB 500 S	39	15399	R.5.1 AGL-F-TLC 1500 F	154.4	23440		
					R.5.2 AGL-F-LPZ-CC-BB 500 F	153.8	5829		
<b>Total</b>	<b>13000</b>		<b>13000</b>	<b>129764</b>		<b>13000</b>	<b>76768.3</b>		
Detour Cost by 2010 :									
Bamban Bridge=	201183			129764			71419		
San Francisco Bridge=	5349			0			5349		
<b>Grand Total=</b>	<b>206532</b>								
Detour Cost after 2011 :									
Bamban Bridge=	161272			104812			56460		
San Francisco Bridge=	5349			0			5349		
<b>Grand Total=</b>	<b>166621</b>								

Abbreviations:

- B : Bamban Bridge
- S : San Francisco Bridge
- N : North Luzon Expressway
- MLL : Malolos
- TLC : Tarlac
- S/F : San Fernando
- AGL : Angeles
- AGL : Angeles
- Friendship Highway
- BB : Bamban
- CC : Concepcion
- LPZ : Lapaz
- CPS : Capas

Note :

- 1) The impassable period of access roads to San Francisco Bridge in typhoon season was assumed 30 days in total ; ten times of each three days. In this period, it was assumed that vehicles make a detour via Santa Rita in stead of taking a route of Mexico-Arayat to avoid the flood prone areas.
- 2) It was assumed that some vehicles bound to Tarlac from Manila make a detour and take the Friendship Highway to avoid the congestion near the San Francisco Bridge in all the seasons except the above 30 days.
- 3) The new North Luzon Expressway was assumed to be opened in 2010, thereafter it was assumed that all the traffic in the current NLE will shift to the new NLE.

**Table E.12 Data for Additional Transportation Cost**

(1) Computation Formula :  $SCF = CFw/o - CFw/$   
 $CF = TDC * DF$   
 $TDC = (\sum_{i=1}^4 VOci * ADTi) * DL$

where , SCF = Cost saving by reduction of risk for road unserviceability caused by flood(P)  
 CF = Cost by flood(P)  
 TDC = Total traffic diversion cost(P)  
 DF =Duration of unserviceability(days)  
 VOci = Vehicle operation cost of vehicle type i(P / vehicle-km)  
 ADTi = Average daily traffic volume of vehicle type i (vehicle / day)  
 DL = Detouring length (km)

(2) Vehicle Operating Cost(VOC)

	Car/van	Jeepney	Bus	Truck	
Vehicle Mix	0.469	0.235	0.156	0.141	
Running Cost(P/km)	2.29	1.61	3.65	4.93	
Fixed Cost(P/min.)	0.123	0.593	0.835	0.937	
ditto (P/km)	0.185	0.89	1.253	1.406	
Total Cost for Modal Mix(P/km)	1.161	0.587	0.765	0.893	3.406

(3) Average Average speed assumed : 40km / hr

(4) Assumed Detour Routes, Distance and Duration of Unserviceability

Season/Duration	Route Code	Distance (km)		Bridge / Highway	No. of Vehicle	Route Alternatives
		Detour	Normal			
Normal Condition (through the year)	N.1 :	-	87.6	B	6000	MLL-N-B-TLC
	N.2 :	-	86.5	B	2500	MLL-B-TLC
	N.3 :	-	57.5	B	2000	S/F-B-TLC
	N.4 :	-	44.3	S	500	S/F-S-CC
	N.5 :	-	39.7	B	2000	AGL-B-TLC
	Total					13000
For Dry/Rainy Season (11 months)	D.1 :	3.7	91.3	S	6000	MLL-N-S-TLC
	D.2 :	25.1	111.6	F	2500	MLL-F-TLC
	D.3 :	4.8	62.3	S	2000	S/F-S-TLC
	D.4 :	0	44.3	S	500	S/F-S-CC
	D.5.1 :	4.8	44.5	S	1500	AGL-S-TLC
	D.5.2 :	27.4	39.0	S	500	AGL-S-CC-CPS-BB
Total					13000	
For Typhoon Season (30 Days)	R.1 :	24.4	112.0	F	6000	MLL-F-TLC
	R.2 :	25.1	111.6	F	2500	MLL-F-TLC
	R.3.1 :	79.1	136.6	F	1500	S/F-F-TLC
	R.3.2 :	90.3	147.8	F	500	S/F-F-LPZ-CC-CPS
	R.4 :	104.7	149.0	F	500	S/F-F-CC
	R.5.1 :	114.7	154.4	F	1500	AGL-F-TLC
R.5.2 :	114.1	153.8	F	500	AGL-F-LPZ-CC-BB	
Total					13000	

Note : 1) "Vehicle Mix" was derived from the Traffic Survey conducted by JICA Study Team in August 1994.  
 2) Abbreviations : AGL: Angeles BB: Bamban CC: Concepcion MLL: Maklos  
 S/F: San Fernando LPZ: Lapaz TLC: Tarlac  
 CPS: Capas F: Friendship Highway  
 B: Bamban Bridge S: San Francisco Bridge

**Table E.13 Basic Data for Estimate of GRDP Loss by Interruption of Economic Activities caused by Flood**

**(1) GRDP of Region 3 in 1990 and Projection in 2010 (by CLDP Study)**

	(Peso 10 <sup>6</sup> , at 1990 price)		
	1990	2010	Growth(%p.a.)
Agriculture	21,468	51,700	4.49
Industry	36,910	214,300	9.19
Services	35,780	192,100	8.77
Total	94,158	458,100	8.23

**(2) Per Capita GRDP of Region 3 (Peso)**

	1990	2010	Growth(%p.a.)	1994(estimated)
Population Region 3	6,199,016	10,501,000	2.67	6,888,061
Per capita GRDP(1990 price)	15,189	43,624	5.42	18,760
Per capita GRDP(1994 price)				26,710

**(3) Per Capita GRDP of non-agricultural sector in Region 3 (Peso)**

	(Peso 10 <sup>6</sup> , at 1990 price)			1994
	1990	2010	Growth(%p.a.)	
GRDP: Industry	36,910	214,300	9.19	
Services	35,780	192,100	8.77	
Total	72,690	406,400	8.99	
Urban Population in Region 3	3733797	8034000	3.91	
Per cap. GRDP of NAS(Peso 1990 price)	19468	50585	4.89	
Oitto (Peso 1994 price)	27719	72023	4.89	33551

**(4) Urbanization Ratio in Study Area in 1994: 54.80%**

**(5) Assumed Duration of Interruption of Economic Activities: 10 Days in a Year**

**(6) Loss of GRDP caused by the Interruption of Economic Activities**

= Number of affected Population \* Urbanization Ratio \* Per Capita GRDP of Non-agricultural Sector \* 10 Days

**(6) GDP Deflator(IFS data)**

	1989	1990	1991	1992	1993	1994(est.)
GDP(P 10 <sup>9</sup> )	925.4	1073.1	1244.4	1351.6	1466.3	
GDP 1990price	1045.3	1073.1	1067.7	1074.4	1095.6	
GDP Deflator	88.53	100.00	116.55	125.80	133.84	142.38

**Table E.14 Probable Indirect Damage for each Flood Return Period  
in Sacobia / Bamban River Basin**

Unit: Pesos million

Flood Return Period	Evacuation & Clean-up Costs	Loss of GRDP	Total
2 years	0.70	8.18	17.83
5	9.89	8.30	18.19
10	10.16	8.53	18.69
20	10.89	9.14	20.03
50	12.29	10.31	22.60
100	19.53	18.45	36.04

**Table E.15 Average Annual Indirect Damage in Sacobia / Bamban River Basin**

(A) Return Period	(B) Average Annual Probability of Exceedance for Return Period	(C) Events within Intervals	(D) Evacuation and Clean-up Costs up to indicated Return Period (Pesos 10 <sup>6</sup> )	(E) Estimated Loss of GRDP up to indicated Return Period (Pesos 10 <sup>6</sup> )	(F) Average Value (Pesos 10 <sup>6</sup> )	(G) Average Value within Intervals (Pesos 10 <sup>6</sup> )	(H) Average Annual Value up to indicated Return Period (Pesos 10 <sup>6</sup> )
2	0.5	0.3	0.70	8.18	26.88	8.09	0.00
5	0.2	0.1	19.53	16.48	45.42	4.54	8.09
10	0.1	0.05	29.75	25.01	64.78	3.24	12.63
20	0.05	0.03	40.64	34.15	86.09	2.58	15.87
50	0.02	0.01	52.83	44.48	115.41	1.15	18.45
100	0.01		72.52	60.91			19.61

Table E.16 Cost-Benefit Analysis of Sacobia/Bamban Flood/Mudflow Control Project

Unit: Peso million

No	Year	Economic Cost			Benefit			Benefit Total	B - C
		Capital	O & M	Cost Total	Flood Control	Detour Cost	Indirect Damage		
1	1996	266.41	71.98	338.39	0.00	0.00	0.00	0.00	-338.39
2	1997	322.89	72.81	395.70	0.00	0.00	0.00	0.00	-395.70
3	1998	832.48	73.94	906.42	0.00	82.77	0.00	82.77	-823.65
4	1999	755.71	77.40	833.11	0.00	84.34	0.00	84.34	-748.77
5	2000		80.53	80.53	140.06	231.22	18.59	389.87	309.34
6	2001		80.53	80.53	151.58	235.62	19.08	406.28	325.75
7	2002		80.53	80.53	164.06	240.09	19.59	423.75	343.22
8	2003		80.53	80.53	177.56	244.66	20.12	442.33	361.80
9	2004		80.53	80.53	192.17	249.30	20.65	462.13	381.60
10	2005		8.55	8.55	207.99	254.04	21.21	483.24	474.69
11	2006		8.55	8.55	225.11	258.87	21.77	505.75	497.20
12	2007		8.55	8.55	243.63	263.79	22.35	529.77	521.22
13	2008		8.55	8.55	263.68	268.60	22.95	555.43	546.88
14	2009		8.55	8.55	285.39	273.91	23.56	582.85	574.30
15	2010		8.55	8.55	308.87	279.11	24.19	612.17	603.62
16	2011		8.55	8.55	334.29	284.45	24.84	648.58	640.03
17	2012		8.55	8.55	361.81	289.81	25.50	681.12	672.57
18	2013		8.55	8.55	391.58	295.25	26.18	719.98	711.43
19	2014		8.55	8.55	423.81	242.78	26.88	693.47	684.92
20	2015		8.55	8.55	458.69	247.39	27.60	733.68	725.13
21	2016		8.55	8.55	496.44	252.09	28.34	776.97	768.32
22	2017		8.55	8.55	537.30	256.88	29.09	823.27	814.72
23	2018		8.55	8.55	581.52	261.76	29.87	873.15	864.60
24	2019		8.55	8.55	629.37	266.74	30.67	926.78	918.23
25	2020		8.55	8.55	681.17	271.81	31.49	984.46	975.91
26	2021		8.55	8.55	737.23	276.97	32.33	1046.53	1037.98
27	2022		8.55	8.55	797.91	282.23	33.19	1113.33	1104.78
28	2023		8.55	8.55	863.57	287.59	34.08	1185.24	1176.69
29	2024		8.55	8.55	934.65	293.06	34.99	1262.69	1254.14
30	2025		8.55	8.55	1011.57	298.63	35.92	1346.11	1337.56
		1568	432	2000	1392	1367	113	2873	873
					(48.5%)	(47.6%)	(3.9%)	(100)	
								EIRR=	16.43%
								NPV(12%)	873

Table E.17 Sensitivity Analysis of Sacobia / Bamban Flood / Mudflow Control Project

Benefit	(% )				
	-20%	-10%	Normal	+10%	+20%
Cost					
-20%	16.43	18.10	19.72	21.28	22.81
-10%	14.88	16.43	17.92	19.36	20.77
Normal	13.59	15.04	16.43	17.77	19.06
+10%	12.48	13.86	15.17	16.43	17.65
+20%	11.53	12.83	14.06	15.27	16.43

**Table E.18 Analysis of Economic Benefit in Sacobia/Bamban River Basin**  
**Table E.18-1 Probable Flood Damage for each Flood Return Period for**  
**Sacobia/Bamban Rivers**

Unit: Pesos 10<sup>3</sup>

Return Period	Crops &			Evacuation & Cleanup Cost	Loss of GRDP	Total
	Buildings	Livestock	Infrastructure			
2 years	55,215	21,356	19,334	9,700	8,180	113,785
5	60,264	21,776	18,758	9,899	8,300	119,999
10	63,541	22,680	19,284	10,180	8,530	124,196
20	72,255	23,615	19,893	10,890	9,140	135,793
50	75,912	24,678	21,647	12,290	10,310	146,237
100	119,069	35,813	21,803	19,580	18,459	212,826

Return Period	Crops &			Evacuation & Cleanup Cost	Loss of GRDP	Total
	Buildings	Livestock	Infrastructure			
2 years	48.53%	18.77%	16.89%	8.52%	7.13%	100
5	50.22%	18.15%	16.47%	8.24%	6.92%	100
10	51.16%	18.28%	15.53%	8.16%	6.87%	100
20	53.21%	17.35%	14.65%	8.02%	6.73%	100
50	51.61%	18.24%	14.39%	8.40%	7.05%	100
100	55.85%	18.87%	10.24%	9.20%	7.73%	100

Return Period	No of Affected Buildings	Affected Agricultural Land(sq.m)	Total Affected Area(sq.km)	Affected Household	Affected Urban Population
5	2,973			3,496	9,775
10	3,063			3,604	10,071
20	3,300	28.07	58.16	3,882	10,650
50	3,768			4,454	12,448
100	5,993		134.06	7,051	19,705

Note: (1) "Affected Household" is computed as "No. of Affected Buildings" divided by 0.85.  
 (2) "Affected Urban Population" = "Affected Household" \* Urbanization Ratio \* Family Size

**Average Annual Damage for 20-Year Return Period (Pesos million)**

Building	Crops &		Evacuation & Cleanup Cost	Loss of GRDP	Detour Cost	Total
	Livestock	Infrastructure				
51.09	19.00	17.06	8.62	7.25	78.77	179.79
26%	11%	9%	5%	4%	43%	100%



Table E.18-2 Average Annual Damage of each Asset in Sacobia / Bamban River Basin

(1) Buildings						
(A)	(B)	(C)	(D)	(E)	(F)	(G)
Return Period	Average Annual Probability of Exceedance for Return Period	Events within Intervals	Flood Damage up to Indicated Return Period (Pesos 10 <sup>6</sup> )	Average Flood Damage (Pesos 10 <sup>6</sup> )	Flood Damage within Intervals (Pesos 10 <sup>6</sup> )	Average Annual Flood Damage up to Indicated Return Period (Pesos 10 <sup>6</sup> )
2	0.5		55.22			0.00
5	0.2	0.3	115.43	65.35	25.60	25.60
10	0.1	0.1	179.02	147.25	14.72	40.33
20	0.05	0.05	251.28	215.15	10.76	51.69
50	0.02	0.03	327.19	289.23	8.68	59.76
100	0.01	0.01	446.26	386.72	3.87	63.63
(2) Crops and Livestock						
(A)	(B)	(C)	(D)	(E)	(F)	(G)
2	0.5		21.36			0.00
5	0.2	0.3	43.13	32.24	9.67	9.67
10	0.1	0.1	65.81	54.47	5.45	15.12
20	0.05	0.05	89.43	77.62	3.88	18.03
50	0.02	0.03	116.11	102.77	3.08	22.08
100	0.01	0.01	152.02	134.06	1.34	23.42
(3) Infrastructures						
(A)	(B)	(C)	(D)	(E)	(F)	(G)
2	0.5		19.33			0.00
5	0.2	0.3	39.09	29.21	8.76	8.76
10	0.1	0.1	58.38	48.74	4.87	13.64
20	0.05	0.05	78.27	68.32	3.42	17.65
50	0.02	0.03	99.32	88.79	2.68	19.72
100	0.01	0.01	121.12	110.22	1.10	20.82
(4) Evacuation and Clean-up Costs						
(A)	(B)	(C)	(D)	(E)	(F)	(G)
2	0.5		9.70			0.00
5	0.2	0.3	19.59	14.65	4.39	4.39
10	0.1	0.1	29.75	24.67	2.47	6.86
20	0.05	0.05	40.64	35.20	1.76	8.52
50	0.02	0.03	52.93	46.79	1.40	10.02
100	0.01	0.01	72.52	62.73	0.63	10.65
(5) Loss of GRDP						
(A)	(B)	(C)	(D)	(E)	(F)	(G)
2	0.5		8.18			0.00
5	0.2	0.3	16.48	12.33	3.70	3.70
10	0.1	0.1	25.01	20.75	2.07	5.77
20	0.05	0.05	34.15	29.58	1.48	7.25
50	0.02	0.03	44.46	39.31	1.18	8.43
100	0.01	0.01	60.91	52.69	0.53	8.96
(6) Total						
(A)	(B)	(C)	(D)	(E)	(F)	(G)
2	0.5		113.79			0.00
5	0.2	0.3	233.78	173.78	52.13	52.13
10	0.1	0.1	357.97	295.87	29.59	81.72
20	0.05	0.05	433.76	425.87	21.29	101.01
50	0.02	0.03	640.00	566.88	17.01	120.02
100	0.01	0.01	852.83	746.41	7.46	127.49

Table E.19 Summary of Barangay Data Base in Abacan River Basin

Province	Municipality	Barangay	Area In sq.km	Population 1974	Homes 1974	Buildings	Population 1974	Buildings	Land Cultivable Area (Ha)	Road Length (km)	No. of Bridges	Irrigation Scheme (ha)	Value of Assets (x 1000 pesos)					
													Buildings	Land				
PAMPANGA	ANGELES CITY	CAPAYA	1.66	4,095	815	693	0	143.13	4,940	0.0	0	0	23,180	2,488.05	4,979			
		PANDAN	0.97	7,992	1,590	1,352	14	0	0.00	3,076	1.0	0	0	36,502	0.00	2,550		
		PULONG MARAGUL	1.21	6,120	1,640	1,421	0	0	14.74	24,299	0.0	0	0	59,469	254.36	28,107		
		SALAPINGAN	2.89	5,122	988	848	68	0	22.07	56,419	0.0	0	0	56,828	245.09	77,550		
		SAPALUBUTAD	2.17	2,900	540	459	0	0	103.67	7,075	0.0	0	0	20,513	2,985.21	9,145		
		TIABUN	1.06	1,341	258	219	0	0	76.79	8,981	1.0	0	0	6,803	1,215.25	7,982		
		ANGELES	9.47	29,570	5,861	4,982	82	0	420,596.66	104,784	2.0	0	0	248,296	6,718	130,263		
		ARAYAT	3.68	2,520	400	340	49	0	343.49	3,490	0.0	0	0	17,340	5,007.04	4,836		
		LACMET	5.15	3,440	620	527	0	0	452.56	0	0.0	0	0	9,250	26,877	5,303.26	5,920	
		SAN ANTONIO	5.23	1,900	340	289	0	0	449.18	6,532	0.0	0	0	14,719	8,274.64	9,221		
		MEXICO	14.25	7,460	1,340	1,164	0	0	1,245	10,023	0.0	0	0	54,156	11,595	20,028		
		MEXICO	SANTANA	ANAO	1.08	1,972	355	302	0	82.70	1,843	0.0	0	0	1,440	15,389	1,407.03	3,502
				BALAS	2.65	1,420	320	272	4	97.78	5,807	1.0	0	0	812	1,040.86	477	
				BUENAVISTA	3.95	911	137	116	1	380.70	0	0.0	0	0	1,065	6,121	5,107.42	677
				CAMUNING	1.84	1,374	220	187	0	169.45	1,879	0.0	0	0	7,474	9,337	2,252.23	7,414
CAWANGAN	3.18			743	135	128	1	297.21	1,940	0.0	0	0	0	5,546	4,134.69	2,798		
CONCEPCION	0.67			1,400	260	221	1	30.18	0	0.0	0	0	0	6,320	323.51	0		
CULUBSA	1.57			1,693	280	218	4	127.72	130	0.0	0	0	0	2,867	1,447.88	40		
DIVISORIA	2.20			1,125	193	164	2	171.75	2,836	0.0	0	0	12,275	5,783	1,828.63	7756		
DOLORES (PIRING)	2.67			1,222	194	165	1	166.77	3,415	1.0	0	0	0	4,218	1,931.94	2,604		
EDEN	2.23			490	90	77	0	215.66	2,691	0.0	0	0	0	3,474	2,680.12	3,355		
GANDUS	3.24			440	85	72	0	298.50	8,501	0.0	0	0	0	3,595	5,040.17	11,605		
LAGUNDI	2.63			2,340	460	408	14	212.63	1,920	0.0	0	0	0	23,902	2,350.90	2,687		
LAPUT	1.18			1,451	234	199	0	23.30	0	0.0	0	0	0	0	248.11	0		
LAOG	1.59			1,980	340	289	0	151.07	442	0.0	0	0	1,084	14,739	1,614.46	13,112		
MASAMAT	2.58			650	140	119	0	238.06	54	0	0	0	0	6,089	3,046.26	75		
MASANSANG	2.76	1,797	338	287	16	191.63	11,989	1.0	0	0	367	18,256	2,002.32	17,570				
PANGALAN	5.90	1,281	201	171	1	519.75	2,192	0.0	0	0	11,790	5,302	6,874.26	6,296				
MEXICO	SANTANA	PARIAN (POB.)	0.39	4,680	820	697	67	38.67	0	0.0	0	0	0	50,639	461.51	0		
		SABANILLA	1.23	900	200	170	1	102.94	0	0.0	0	0	0	8,895	1,255.98	0		
		SAN ANTONIO	0.28	4,160	740	629	13	22.15	0	0.0	0	0	0	27,611	235.81	0		
		SAN CARLOS	0.84	1,974	400	340	8	81.95	0	0.0	0	0	19,142	975.03	0			
		SAN JOSE MALINO	2.39	3,532	585	497	5	234.29	3,966	0.0	0	0	0	25,548	2,848.30	5,364		
		SAN JOSE MATULLID	2.22	2,380	360	306	0	119.91	5,238	3.0	0	0	1,215	12,287	1,276.74	7,685		
		SAN JUAN	1.01	2,351	458	389	0	96.19	0	0.0	0	0	0	10,200	1,024.21	0		
		SAN ROQUE	1.54	660	120	102	1	140.44	0	0.0	0	0	0	5,427	1,846.22	1,100		
		SAN VICENTE	2.19	2,677	425	361	0	211.90	0	0.0	0	0	0	18,424	2,257.43	0		
		STA. CRUZ	1.21	1,569	274	231	1	207.62	4,647	3.0	0	0	0	6,055	2,210.34	5,428		
		STA. MARIA	1.73	1,778	353	302	3	134.62	439	0.0	0	0	0	16,065	1,681.60	614		
		STA. DOMINGO	1.85	1,253	255	217	13	150.33	2,923	1.0	0	0	0	13,983	1,694.23	4,092		
		STO. ROSARIO	3.24	2,020	408	340	5	220.18	546	1.0	0	0	0	746	2,344.27	53		
		SUCLANAY	3.14	622	102	87	0	272.54	37	0.0	0	0	0	2,005	4,269.89	24		
		TANGLAY (TANGLE)	2.25	779	140	119	0	213.76	0	0.0	0	0	0	4,591	3,413.48	0		
MEXICO	SANTANA	MEXICO	68.88	51,694	9,653	8,203	162	5,614	63,433	12.8	0	0	36,709	353,705	71,246	92,524		
		SAN AGUSTIN	3.50	1,931	339	288	1	64.74	5,908	0.0	0	0	0	8,754	484,192	4,652		
		SAN BARTOLOME	2.71	1,242	224	190	0	221.66	0	0.0	0	0	0	10,837	2,360.10	0		
		SAN ISIDRO	3.00	4,780	800	680	3	276.28	0	0.0	0	0	260	38,356	3,018.04	166		
		SAN JOAQUIN (POB.)	2.63	2,196	368	313	66	163.75	0	1.0	0	0	0	30,819	1,743.46	550		
		SAN JUAN	1.40	1,440	259	220	3	91.27	245	0.0	0	0	0	11,903	971.76	343		
		SAN PABLO	3.96	3,080	580	493	0	372.69	4,565	0.0	0	0	0	25,143	53,992.32	6,391		
		SAN PEDRO	1.66	1,047	160	136	0	105.03	1,222	0.0	0	0	1,212	6,936	1,316.10	2,486		
		SAN ROQUE	5.29	2,412	393	334	1	397.89	6,468	0.0	0	0	0	11,005	4,236.44	6,387		
		SANTIAGO	3.11	2,047	471	400	0	270.75	0	0.0	0	0	0	20,418	3,039.47	0		
		SANTO ROSARIO	4.04	603	96	417	389.07	0	0	0.0	0	0	0	53,325	96,828	42,541.51	3,408	
		SANTA ANA	32.62	21,404	3,107	3,151	496	2,745	18,408	1.0	0	0	0	260,688	30,981	24,583		
		Total	125.22	112,528	20,379	17,492	740	18,043	196,647	15.00	53,335	0	0	840,645	127,610	267,840		

Table E.19 Summary of Barangay Data Base in Abacan River Basin

Province	Municipality	Barangay	Flood Damages by Return Period (X1000 pesos)			Flood Damages by Return Period (X1000 pesos)			Flood Damages by Return Period (X1000 pesos)					
			2 years	5 years	10 years	2 years	5 years	10 years	2 years	5 years	10 years			
			Buildings	Land	Infra-structure	Buildings	Land	Infra-structure	Buildings	Land	Infra-structure			
PAMPANGA	ANGELES CITY	CAPIYA	0.00	1,133.69	0.00	0.00	1,330.66	0.00	0.00	0.00	1,380.15	0.00		
		PANBAN	0.00	765.06	0.00	0.00	714.06	0.00	0.00	0.00	484.54	0.00		
		PULONG MARAGUL	764.40	1,666.39	904.80	0.00	1,686.39	1,053.00	0.00	0.00	1,686.39	0.00		
		SALAPONGAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		SAPALBUHAY	70.20	548.70	107.25	0.00	640.15	107.25	0.00	0.00	731.60	0.00		
		TABUN	294.00	5,212.15	245.70	0.00	3,911.26	253.50	0.00	0.00	4,150.73	0.00		
			1,068.60	7,665.99	1,257.75	0.00	8,276.71	1,413.75	0.00	0.00	8,433.40	0.00		
		ANGELLES ARAYAT	AENAS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			LACBAT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			SAN ANTONIO	0.00	740.22	276.68	0.00	822.46	276.68	0.00	0.00	822.46	276.68	
				0.00	740.22	276.68	0.00	822.46	276.68	0.00	0.00	822.46	276.68	
			MEXICO	ANAO	7,494.10	0.00	430.25	79,977.00	0.00	420.25	9,394.00	0.00	353.31	0.00
				BALAS	0.00	156.13	23.84	0.00	187.36	23.84	0.00	0.00	187.36	23.84
				BUENAVISTA	0.00	715.04	20.31	0.00	766.11	27.07	0.00	0.00	868.26	33.84
				CAMUNING	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CAYAYAN	771.45			0.00	335.78	1,065.79	0.00	343.76	1,218.05	0.00	419.73	0.00		
CONCEPCION	0.00			42.06	0.00	0.00	16.18	0.00	0.00	0.00	42.06	0.00		
CULIBASA	0.00			0.00	8.39	0.00	0.00	0.00	0.00	0.00	0.00	12.19		
DIVISORIA	0.00			164.58	135.12	0.00	164.58	155.12	0.00	0.00	164.58	155.12		
DOLORES (PRING)	0.00			19.32	0.00	0.00	19.32	0.00	0.00	0.00	19.32	0.00		
EDEN	0.00			0.00	100.64	0.00	100.64	0.00	0.00	0.00	194.19	0.00		
GANDUS	0.00			0.00	1.65	0.00	116.05	0.00	0.00	0.00	232.10	0.00		
LAGUNDI	3,705.15	1,034.40		241.87	3,969.81	1,034.40	241.87	4,703.77	1,034.41	295.61	0.00			
LAPUT	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
LAUD	0.00	306.52		78.72	0.00	366.82	78.72	0.00	0.00	366.82	78.72			
MASAMAC	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
MANGSANG	30,754.03	1,258.14	2,637.44	33,119.72	1,278.76	2,811.14	39,221.88	1,320.01	3,162.53	0.00				
PANGALIAN	0.00	3,693.41	1,196.51	0.00	3,162.15	1,196.51	0.00	0.00	3,230.90	1,522.34				
PARIAN (POB.)	0.00	258.45	0.00	0.00	258.45	0.00	0.00	0.00	263.06	0.00				
SABANILLA	155.90	0.00	226.08	0.00	238.64	0.00	0.00	0.00	226.08	0.00				
SAN ANTONIO	0.00	77.82	0.00	0.00	164.04	0.00	0.00	0.00	633.28	0.00				
SAN CARLOS	633.78	0.00	0.00	0.00	692.28	0.00	0.00	0.00	633.28	0.00				
SAN JOSE	205.24	0.00	730.97	197.03	1,196.29	750.97	277.08	1,567.19	858.26	0.00				
SAN JOSE MATULID	4,928.62	497.93	768.49	5,914.35	510.70	843.34	7,722.00	336.23	1,152.74	0.00				
SAN JUAN	0.00	146.36	0.00	0.00	153.43	0.00	0.00	0.00	174.12	0.00				
SAN VICENTE	25.62	320.56	44.00	25.62	320.56	44.00	25.62	320.56	44.00	44.00				
STA. CRUZ	0.00	309.40	271.38	0.00	331.58	271.38	0.00	0.00	309.40	271.38				
STA. MARIA	164.10	613.38	49.15	164.10	655.82	49.15	164.10	655.82	49.15	49.15				
STO. DOMINGO	524.17	465.23	327.36	645.72	497.31	327.36	615.33	481.27	327.36	2.65				
STO. ROSARIO	1,549.16	445.42	2.65	2,020.42	1,684.86	3.18	1,836.73	445.42	2.65	0.00				
SUCLABAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
TANGLAY (TRIANGLE)	50,267.04	12,654.43	75,509.77	55,203.61	12,977.09	7,845.87	65,701.68	13,547.71	3,112.05	0.00				
MEXICO	SANTIAANA	SAN AGUSTIN	277.98	671.35	280.14	305.76	919.97	291.14	250.18	871.55	291.14			
		SAN BARTOLOME	0.00	1,132.85	0.00	0.00	1,156.45	0.00	0.00	1,274.45	0.00			
		SAN ISIDRO	0.00	362.17	4.99	0.00	392.55	6.63	0.00	422.53	6.63			
		SAN JOAQUIN (POB.)	0.00	801.99	71.50	0.00	871.73	77.00	0.00	950.90	88.00			
		SAN JUAN	0.00	301.24	24.00	0.00	242.94	20.57	0.00	291.53	27.43			
		SAN PABLO	1,684.80	2,213.72	766.86	2,359.50	2,321.71	830.77	2,854.80	2,483.69	958.58			
		SAN PEDRO	0.00	100.45	49.73	0.00	66.97	24.86	0.00	66.97	24.86			
		SAN ROQUE	6,390.86	1,694.57	702.55	7,131.55	1,736.94	766.42	12,264.57	2,033.49	1,788.32			
		SANTIAGO	0.00	1,428.55	0.00	0.00	1,367.76	0.00	0.00	1,550.13	0.00			
		SANTO DOMINGO	907.59	1,744.20	374.56	866.54	1,744.20	340.78	928.22	1,871.83	374.56			
			9,255.24	10,651.29	2,393.63	10,651.29	10,651.29	2,393.63	16,297.77	11,665.95	3,539.45			
			60,586.89	24,046.14	17,757.37	67,134.33	24,640.53	18,763.46	83,414.13	25,995.23	21,381.96			

Table E.19 Summary of Barangay Data Base in Abocan River Basin

Province	Municipality	Barangay	Flood Damages by Return Period (P1000 pesos)			Flood Damages by Return Period (P20000 pesos)			Flood Damages by Return Period (P100000 pesos)			Affected Area (sq.km)				
			Buildings	Land	Infra-structure	Buildings	Land	Infra-structure	Buildings	Land	Infra-structure	20 years	100 years			
PANGASINAN	ANGELIS CITY	CAPAYA	0.00	0.00	1,330.86	0.00	0.00	1,330.86	0.00	0.00	1,281.57	0.04	0.66			
		PANDAN	394.66	0.00	561.04	576.57	0.00	0.00	576.57	0.00	0.00	789.56	0.17	0.70		
		PULONG MARAGUT	2,324.40	0.00	1,686.39	4,436.25	0.00	0.00	1,967.46	0.00	0.00	2,248.52	0.32	0.68		
		SALUNGAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		SAPALBUTAD	215.47	0.00	914.50	508.85	0.00	0.00	1,897.46	0.00	0.00	1,005.95	0.36	0.78		
		TABUN	265.26	0.00	4,250.55	2,257.25	0.00	0.00	4,900.19	0.00	0.00	4,944.94	0.76	1.01		
		MEDINA	ANGRIFES	ARAYAT	3,199.73	0.00	7,774.62	7,774.62	0.00	9,521.64	0.00	0.00	19,224.53	1.48	3.90	
				LAGMIT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		MEDINA	ARAYAT	SAN ANTONIO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				SAN ANTONIO	822.46	0.00	276.68	5.85	740.22	276.68	2,081.63	1,612.75	3,683.91	0.05	1.47	
		MEDINA	MEDINA	ANAPO	9,822.13	0.00	490.29	9,029.47	0.00	453.27	15,779.40	0.00	735.44	0.59	0.90	
				BALAS	0.00	166.54	21.84	694.55	269.21	42.91	270.63	33.38	0.01	0.46	0.01	0.46
				BUENAVISTA	0.00	868.26	33.54	0.00	1,072.56	60.92	0.00	1,174.70	54.15	0.69	1.35	
				CAMUNING	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				CAYAYAN	2,914.18	0.00	475.69	4,157.60	0.00	0.00	3,603.47	0.00	1,007.54	1.36	2.81	
				CONCEPCION	0.00	45.29	0.00	0.00	16.18	0.00	0.00	19.41	0.00	0.00	0.00	
				CULIBASA	191.99	0.00	15.19	1,064.52	0.00	17.19	9,902.41	0.00	23.58	0.66	1.27	
				DIVISORIA	0.00	182.86	153.12	0.00	337.72	232.69	46.66	274.29	155.12	0.19	0.59	
				DOLORES (PDRNG)	0.00	193.22	0.00	0.00	193.22	0.00	0.00	193.22	0.00	0.00	0.00	
				EDEN	0.00	0.00	134.19	0.00	0.00	134.19	0.00	0.00	137.73	0.00	0.24	
				GANDUS	0.00	232.10	0.00	0.00	116.05	0.00	116.05	0.00	0.00	0.00	0.00	
				LAGUNDI	5,293.07	1,151.94	322.49	10,056.84	1,504.57	644.98	5,577.73	1,198.96	322.49	1.75	2.15	
				LAPUT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				LAUG	0.00	306.82	78.72	0.00	339.12	78.72	0.00	397.50	78.72	0.02	1.16	
MASAMAT	0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
MASANGANG	0.00			1,443.76	5270.88	1,815.02	11,947.32	1,711.89	78,183.35	1,711.89	9,838.97	2.48	2.71			
PANGATLAN	0.00			3,437.13	1,209.28	4,599.55	2,003.73	1,692.26	4,262.04	1,574.09	2.26	4.50				
PARAN (POB.)	0.00			783.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
SABANILLA	48.24			238.64	0.00	144.73	461.91	0.00	906.39	501.44	0.00	0.24	0.54			
SAN ANTONIO	172.67			91.96	0.00	232.53	110.83	0.00	349.85	120.26	0.00	0.12	0.23			
SAN CARLOS	0.00			663.03	0.00	916.54	0.00	0.00	926.29	0.00	0.00	0.00	0.00			
SAN JOSE MALINO	496.34			1,566.37	1,019.18	130.18	1,338.70	750.97	4,669.30	1,593.05	894.01	0.31	1.67			
SAN JOSE MATULID	11,204.70			600.97	1,690.68	22,474.73	727.74	2,459.17	31,783.75	753.28	1,948.08	0.95	1.75			
SAN JUAN	225.33			339.52	44.00	122.99	0.00	0.00	352.67	215.08	0.00	0.00	0.16			
SAN ROQUE	20.50	35.87	396.11	44.00	452.69	44.00	44.00	44.00	44.00	0.00	0.29					
SAN VICENTE	669.51	0.00	89.70	812.67	0.00	0.00	1,158.50	948.12	0.00	0.00	0.51					
STA. CRUZ	353.69	271.38	464.21	484.20	744.76	390.55	271.38	271.38	0.00	1.08	1.88					
STA. MARIA	1,641.10	753.09	49.15	184.62	807.17	49.15	164.10	857.62	49.15	1.01	1.46					
STO. DOMINGO	11,231.11	545.44	368.28	2,033.39	641.69	368.28	3,692.01	834.20	368.28	0.36	1.75					
STO. ROSARIO	203,615	468.66	3.18	4,297.96	699.51	849	4,502.64	632.96	10.08	0.79	0.98					
SUCLABAN	0.00	0.00	7.07	0.00	684	0.00	0.00	0.00	8.72	1.45	2.55					
TANGLAY (PANGLE)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.84					
MEDINA	SANTAANA		89,450.28	14,310.49	11,844.55	145,757.15	17,378.83	20,462.68	17,987.02	17,809.45	17.39	35.61				
MEDINA	SANTAANA	SAN AGUSTIN	337.55	939.97	339.67	943.15	1,307.52	776.38	1,536.84	1,307.32	339.67	0.35	2.13			
		SAN BARTOLOME	0.00	1,439.46	0.00	0.00	1,345.26	0.00	1,746.47	0.00	0.00	0.66	1.66			
		SAN ISIDRO	0.00	472.71	6.65	0.00	392.35	4.99	784.33	6.65	0.18	0.94				
		SAN JOAQUIN (POB.)	0.00	1,063.51	99.00	1,046.08	0.00	0.00	1,394.77	121.00	0.83	1.87				
		SAN JUAN	233.22	0.00	29.57	35.50	339.55	30.85	187.95	388.70	39.85	0.14	0.44			
		SAN PABLO	4,554.23	2,699.66	1,046.39	5,056.85	2,645.67	800.77	10,998.00	2,044.97	2.06	3.09				
		SAN PEDRO	0.00	111.61	49.73	0.00	78.13	24.86	100.45	24.86	0.01	0.19				
		SAN ROQUE	15,565.43	2,302.95	2,171.53	9,597.64	1,993.13	894.16	14,890.00	2,457.13	1,277.37	2.27	3.96			
		SANTIAGO	0.00	1,762.89	0.00	0.00	1,762.89	0.00	1,975.65	0.00	0.00	1.24	2.08			
		SANTO ROSARIO	1,237.63	2,084.53	477.10	1,732.68	763.40	1,360.11	4,771.00	1,360.11	477.10	2.18	3.02			
				21,694.83	15,270.71	42,500.62	17,335.62	13,371.47	1,033.81	28,974.19	16,968.53	4,372.46	9.92	20.18		
				106,344.84	24,103.96	25,193.34	168,672.84	31,490.52	30,746.81	233,627.63	35,668.90	32,725.56	29.21	61.15		

Table E.19 Summary of Barangay Data Base in Abacan River Basin

Province	Municipality	Barangay	Evacuation and Clean-up Costs										Loss of CRDP						
			2 years	5 years	10 years	20 years	50 years	100 years	100 years	50 years	20 years	10 years	5 years	10 years	20 years	50 years	100 years		
PAMPANGA	ANGELES CITY	CAPIVA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	
		PANDAN	0.00	0.00	0.00	0.04	0.06	0.04	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.70	
		PULONGMARGUL	0.40	0.42	0.49	1.07	1.44	2.11	3.34	4.41	5.35	6.41	7.77	9.41	10.90	12.38	13.88	15.77	
		SALARINGAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		SABALBUHAD	0.00	0.04	0.04	0.06	0.10	0.14	0.20	0.25	0.33	0.41	0.50	0.60	0.71	0.82	0.93	1.05	
		TABUN	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.12
		ARENAS	0.45	0.47	0.54	1.19	1.52	1.92	2.37	2.87	3.42	3.99	4.58	5.19	5.81	6.44	7.09	7.74	
		LACMIT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		SAN ANTONIO	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	
		ANAO	1.45	1.46	1.44	1.58	1.59	1.71	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	
		BALAS	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		BUENAVISTA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		CAMUNING	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		CAYAYAN	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	
CONCEPCION	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
CULBASA	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
DIVISORIA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
DOLORES (TRUNG)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
EDEN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
GANDUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
LAGUNDI	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			
LAPUT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
LAUG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
MASANGANG	3.42	3.42	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44			
PANGATLAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
PANDAN (P.O.B.)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
SABANILLA	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02			
SAN ANTONIO	0.06	0.07	0.07	0.07	0.09	0.11	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13			
SAN CARLOS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
SAN JOSE MALINO	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04			
SAN JOSE MATULED	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21			
SAN JUAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
SAN ROQUE	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02			
SAN VICENTE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
STA. CRUZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
STA. MARIA	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07			
STO. DOMINGO	0.17	0.18	0.19	0.29	0.33	0.37	0.44	0.50	0.55	0.60	0.66	0.73	0.80	0.87	0.94	1.00			
STO. ROSARIO	0.59	0.63	0.63	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70			
SUCLIANAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
TANGLAY (JANGLE)	8.00	8.18	8.24	9.02	10.25	11.49	12.72	13.95	15.18	16.41	17.64	18.87	20.10	21.33	22.56	23.79			
SAN AGUSTIN	0.10	0.10	0.10	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12			
SAN BARTOLOME	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
SAN ISIDRO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
SAN JOAQUIN (P.O.B.)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
SAN JUAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
SAN PABLO	0.15	0.44	0.44	0.62	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81			
SAN PEDRO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
SAN ROQUE	1.36	1.36	1.36	1.45	1.66	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75			
SANTIAGO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
SANTO ROSARIO	1.45	1.54	1.54	2.24	2.78	3.30	3.59	3.87	4.15	4.42	4.69	4.95	5.21	5.47	5.73	5.99			
SANTA ANA	10.36	10.55	10.76	12.45	14.39	16.27	17.84	19.20	20.27	21.07	21.58	21.87	22.05	22.15	22.18	22.19			
Total																			

**Table E.20 Number of Buildings Located in Probable Flood Areas in Abacan River  
Abacan River (1/4)**

Sheet No.	Barangays	Return Period of Flood					
		2 Years	5 years	10 years	20 years	50 years	100 years
<b>ANGELES CITY</b>							
20	Pulong Maragul 2009020	112	4	19	163	157	131
			116	135	298	455	586
	Sapang Libutad 2009026	0	3	0	6	12	11
			3	3	9	21	32
	Pandan 2009018	0	0	0	12	5	215
			0	0	12	17	232
	Tabun 2009032	4	0	0	0	29	85
			4	4	4	33	118
	Capaya 2009005	0	0	0	0	0	113
			0	0	0	0	113
	<b>Total</b>	<b>116</b>	<b>7</b>	<b>19</b>	<b>181</b>	<b>203</b>	<b>555</b>
			123	142	323	526	1,081
<b>MEXICO</b>							
21	Culubasa 2021008	0	0	0	3	13	8
			0	0	3	16	24
	Cawayan 2021006	40	10	0	49	29	26
			50	50	99	128	154
	Sapang Libutad A.C. 2009026	8	0	0	0	0	0
			8	8	8	8	8
	<b>Total</b>	<b>48</b>	<b>10</b>	<b>0</b>	<b>52</b>	<b>42</b>	<b>34</b>
			58	58	110	152	186
<b>MEXICO</b>							
22	San Agustín, Sta. Ana 2022001	0	0	0	1	14	19
			0	0	1	15	34
	San Antonio, Arayat 2012020	0	0	0	0	2	303
			0	0	0	2	305
	Anao 2021002	0	0	0	28	0	30
			0	0	28	28	58
	Cawayan 2021006	0	0	0	0	0	9
			0	0	0	0	9
	Pangatlan, Sn Jose, Mal. 2021026	4	0	0	0	0	0
			4	4	4	4	4
	<b>Total</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>29</b>	<b>16</b>	<b>361</b>
			4	4	33	49	410

Table E.20 Number of Buildings Located in Probable Flood Areas in Abacan River  
Abacan River (2/4)

Sheet No.	Barangays	Return Period of Flood					
		2 Years	5 years	10 years	20 years	50 years	100 years
<b>MEXICO</b>							
28	Pangatlan Sn Jose, Mal. 2021026	4	0	1	2	1	170
			4	5	7	8	178
	Culubasa 2021008	0	0	0	0	0	105
			0	0	0	0	105
	<b>Total</b>	4	0	1	2	1	275
			4	5	7	8	283
<b>MEXICO</b>							
29	Sio. Rosario 2021041	9	0	0	19	1	0
			9	9	28	29	29
	San Vicente 2021036	0	0	0	0	4	62
			0	0	0	4	66
	Balas 2021003	0	0	0	0	36	107
			0	0	0	36	143
	Sia. Cruz 2021038	0	0	0	0	0	83
			0	0	0	0	83
	Pangatlan 2021020	0	0	0	0	0	28
			0	0	0	0	28
	Anao 2021002	404	2	4	0	3	5
			406	410	410	413	418
	<b>Sub-Total</b>	413	2	4	19	44	285
			415	419	438	482	767
<b>STA. ANA</b>							
	San Pablo 2022008	96	25	1	51	73	36
			121	122	173	246	282
	San Roque 2022010	379	0	8	16	58	24
			379	387	403	461	485
	San Agustin 2022001	0	0	0	5	2	60
			0	0	5	7	67
	<b>Sub-Total</b>	475	25	9	72	133	120
			500	509	581	714	834
	<b>Total</b>	858	27	13	91	177	405
			915	928	1,019	1,196	1,601

**Table E.20 Number of Buildings Located in Probable Flood Areas in Abacan River**  
Abacan River (3/4)

Sheet No.	Barangays	Return Period of Flood					
		2 Years	5 years	10 years	20 years	50 years	100 years
<b>STA. ANA</b>							
30	San Agustin	28	0	0	0	0	0
	2022001		28	28	28	28	28
	Sto. Rosario	11	1	0	0	0	0
	2022013		12	12	12	12	12
	<b>Total</b>	<b>39</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
			40	40	40	40	40
<b>MEXICO</b>							
31	Sabanilla	0	0	0	6	0	76
	2021023		0	0	6	6	82
	Masamat	0	0	0	0	0	5
	2021016		0	0	0	0	5
	Lagundi	231	0	0	0	0	0
	2021013		231	231	231	231	231
	Masangsang	949	0	7	0	9	0
	2021017		949	956	956	965	965
	Divisoria	0	0	0	0	0	15
	2021009		0	0	0	0	15
	San Jose Matubid	337	0	23	82	181	367
	2021027		337	360	442	623	990
	San Antonio	18	1	0	1	6	10
	2021024		19	19	20	26	36
	Sto. Rosario	155	11	0	0	0	0
	2021041		166	166	166	166	166
	<b>Total</b>	<b>1,690</b>	<b>12</b>	<b>30</b>	<b>89</b>	<b>196</b>	<b>473</b>
			1,702	1,732	1,821	2,017	2,490



**Table E.20 Number of Buildings Located in Probable Flood Areas in Abacan River (4/4)**

Sheet No.	Barangays	Return Period of Flood					
		2 Years	5 years	10 years	20 years	50 years	100 years
<b>MEXICO</b>							
32	San Juan, Sta. Ana 2022006	0	0	0	0	2	8
	San Roque 2021035	5	0	0	0	2	0
	Sta. Maria 2021039	20	0	0	0	0	0
	Sto. Domingo 2021040	46	5	3	27	65	97
	Dolores (Piring) 2021010	0	0	0	0	0	78
	<b>Total</b>	<b>71</b>	<b>5</b>	<b>3</b>	<b>27</b>	<b>69</b>	<b>183</b>
	<b>Grand Total</b>	<b>2,860</b>	<b>62</b>	<b>66</b>	<b>471</b>	<b>704</b>	<b>2,286</b>
			<b>2,922</b>	<b>2,988</b>	<b>3,459</b>	<b>4,163</b>	<b>6,449</b>

**Table E.21 Probable Flood Damage for each Flood Return Period in Abacan River Basin**

Unit: Pesos 10<sup>3</sup>

Value of Assets	Buildings	Crops & Livestock	Infrastructure	Total
Return Period				
2 years	60,587	25,729	17,759	104,076
5	67,125	28,505	18,763	114,393
10	83,414	27,815	21,382	132,611
20	108,345	30,071	25,195	163,611
50	168,873	33,695	33,675	236,242
100	233,827	38,165	32,726	304,718

**Table E.22 Estimated Average Annual Damage under without-Project Condition in Abacan River Basin**

(A) Return Period	(B) Average Annual Probability of Exceedance for Return Period	(C) Events within Intervals	(D) Flood Damage up to Indicated Return Period (Pesos 10 <sup>6</sup> )	(E) Average Flood Damage (Pesos 10 <sup>6</sup> )	(F) Flood Damage within Intervals (Pesos 10 <sup>6</sup> )	(G) Average Annual Flood Damage up to Indicated Return Period (Pesos 10 <sup>6</sup> )
2	0.5		104.08			0.00
5	0.2	0.3	216.33	160.20	48.06	48.06
10	0.1	0.1	348.94	282.63	28.26	76.32
20	0.05	0.05	512.55	430.75	21.54	97.86
50	0.02	0.03	748.79	630.67	18.92	116.78
100	0.01	0.01	1053.51	901.15	9.01	125.79

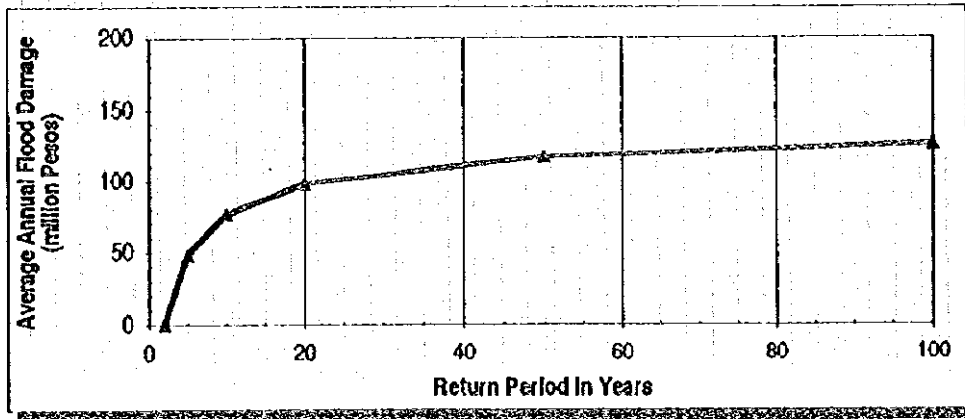


Table E.23 Probable Indirect Damage for Flood Return Period in Abacan River Basin

Unit: Pesos million			
Flood Return Period	Evacuation & Clean-up Costs	Loss of GDP	Total
2 years	10.30	8.64	18.94
5	10.52	8.83	19.35
10	10.72	9.03	19.75
20	12.45	10.45	22.90
50	14.99	12.58	27.57
100	23.22	19.43	42.71

Table E.24 Average Annual Indirect Damage in Abacan River Basin

(A) Return Period	(B) Average Annual Probability of Exceedance for Return Period	(C) Events within Intervals	(D) Evacuation and Clean-up Costs up to indicated Return Period (Pesos 10 <sup>6</sup> )	(E) Estimated Loss of GDP up to indicated Return Period (Pesos 10 <sup>6</sup> )	(F) Average Value (Pesos 10 <sup>6</sup> )	(G) Average Value within Intervals (Pesos 10 <sup>6</sup> )	(H) Average Annual Value up to indicated Return Period (Pesos 10 <sup>6</sup> )
2	0.5		10.30	8.64			0.00
5	0.2	0.3	20.82	17.47	41.18	13.25	13.25
10	0.1	0.1	31.54	26.50	74.35	7.43	20.69
20	0.05	0.05	43.99	36.95	107.26	5.36	26.05
50	0.02	0.03	58.08	49.53	146.21	4.39	30.44
100	0.01	0.01	82.20	68.02	200.46	2.00	32.44

**Table E.25 Cost-Benefit Analysis of Abacan Flood/Mudflow Control Project**

Unit: Pesos million

No	Year	Economic Cost			Benefit		Benefit Total	B - C
		Capital	O & M	Cost Total	Flood Control	Indirect Damage		
1	1996	73.04	23.99	97.03	0.00	0.00	0.00	-97.03
2	1997	115.90	24.18	140.08	0.00	0.00	0.00	-140.08
3	1998	328.81	24.62	353.43	0.00	0.00	0.00	-353.43
4	1999	245.45	25.95	271.44	0.00	0.00	0.00	-271.44
5	2000		3.00	3.00	157.29	30.51	187.80	184.80
6	2001		3.00	3.00	170.23	32.00	202.23	199.23
7	2002		3.00	3.00	184.24	33.57	217.81	214.81
8	2003		3.00	3.00	199.40	35.21	234.61	231.61
9	2004		3.00	3.00	215.82	36.93	252.75	249.75
10	2005		3.00	3.00	233.58	38.74	272.31	269.31
11	2006		3.00	3.00	252.80	40.63	293.43	290.43
12	2007		3.00	3.00	273.61	42.62	316.22	313.22
13	2008		3.00	3.00	296.12	44.70	340.83	337.83
14	2009		3.00	3.00	320.49	46.89	367.38	364.38
15	2010		3.00	3.00	346.87	49.18	396.05	393.05
16	2011		3.00	3.00	375.42	51.59	427.01	424.01
17	2012		3.00	3.00	406.32	54.11	460.43	457.43
18	2013		3.00	3.00	439.75	56.76	496.51	493.51
19	2014		3.00	3.00	475.95	59.53	535.48	532.48
20	2015		3.00	3.00	515.12	62.44	577.56	574.56
21	2016		3.00	3.00	557.51	65.50	623.01	620.01
22	2017		3.00	3.00	603.39	68.70	672.09	669.09
23	2018		3.00	3.00	653.05	72.06	725.11	722.11
24	2019		3.00	3.00	706.80	75.58	782.38	779.38
25	2020		3.00	3.00	764.97	79.28	844.25	841.25
26	2021		3.00	3.00	827.93	83.15	911.08	908.08
27	2022		3.00	3.00	896.07	87.22	983.29	980.29
28	2023		3.00	3.00	969.81	91.49	1061.30	1058.30
29	2024		3.00	3.00	1049.63	95.96	1145.59	1142.59
30	2025		3.00	3.00	1136.01	100.65	1236.66	1233.66
		548	90	637	1563	223	1786	1149
					(87.5%)	(12.5%)	(100)	
							EIRR=	24.05%
							NPV(12%)=	1149

**Table E.26 Sensitivity Analysis of Abacan Flood/Mudflow Control Project**

Benefit	( % )				
	-20%	-10%	Normal	+10%	+20%
Cost					
-20%	24.05	25.90	27.67	29.38	31.02
-10%	22.31	24.05	25.70	27.29	28.82
Normal	20.86	22.49	24.05	25.54	26.97
+10%	19.62	21.16	22.64	24.05	25.40
+20%	18.53	20.01	21.41	22.76	24.05

Table E 27 Analysis of Economic Benefit in Abacan River Basin

Table 27-1 Probable Flood Damage for each Flood Return Period in Abacan River Basin

Return Period	Crops & Livestock		Evacuation & Loss of			Total
	Buildings	Infrastructure	Cleanup Cost	GRDP		
2 years	60,587	25,729	17,759	10,300	8,840	123,016
5	67,125	28,505	18,763	10,520	8,830	133,743
10	83,414	27,815	21,382	10,720	9,030	152,361
20	108,345	30,071	25,195	12,450	10,450	198,511
50	168,873	33,695	30,875	14,990	12,580	263,812
100	233,827	38,165	32,728	23,220	19,490	347,428

Return Period	Crops & Livestock		Evacuation & Loss of			Total
	Buildings	Infrastructure	Cleanup Cost	GRDP		
2 years	49.95%	20.32%	14.44%	8.37%	7.02%	100
5	50.19%	21.31%	14.03%	7.87%	8.60%	100
10	54.75%	14.28%	14.63%	7.04%	5.83%	100
20	58.09%	16.12%	13.51%	6.68%	5.60%	100
50	64.01%	12.77%	12.76%	5.68%	4.77%	100
100	67.30%	10.99%	9.42%	6.58%	5.61%	100

Return Period	No. of Affected Buildings	Affected Agricultural Land (sq.m)	Total Affected Area (sq km)	Affected Household	Affected Urban Population
	2 years	2,860			3,365
5	2,922			3,438	9,608
10	2,968			3,515	9,825
20	3,459	15.40	29.21	4,099	11,373
50	4,163			4,998	13,585
100	6,449		61.15	7,587	21,204

Note: (1) 'Affected Household' is computed as 'No. of Affected Buildings' divided by 0.85.  
 (2) 'Affected Urban Population' = 'Affected Household' \* Urbanization Ratio \* Family Size

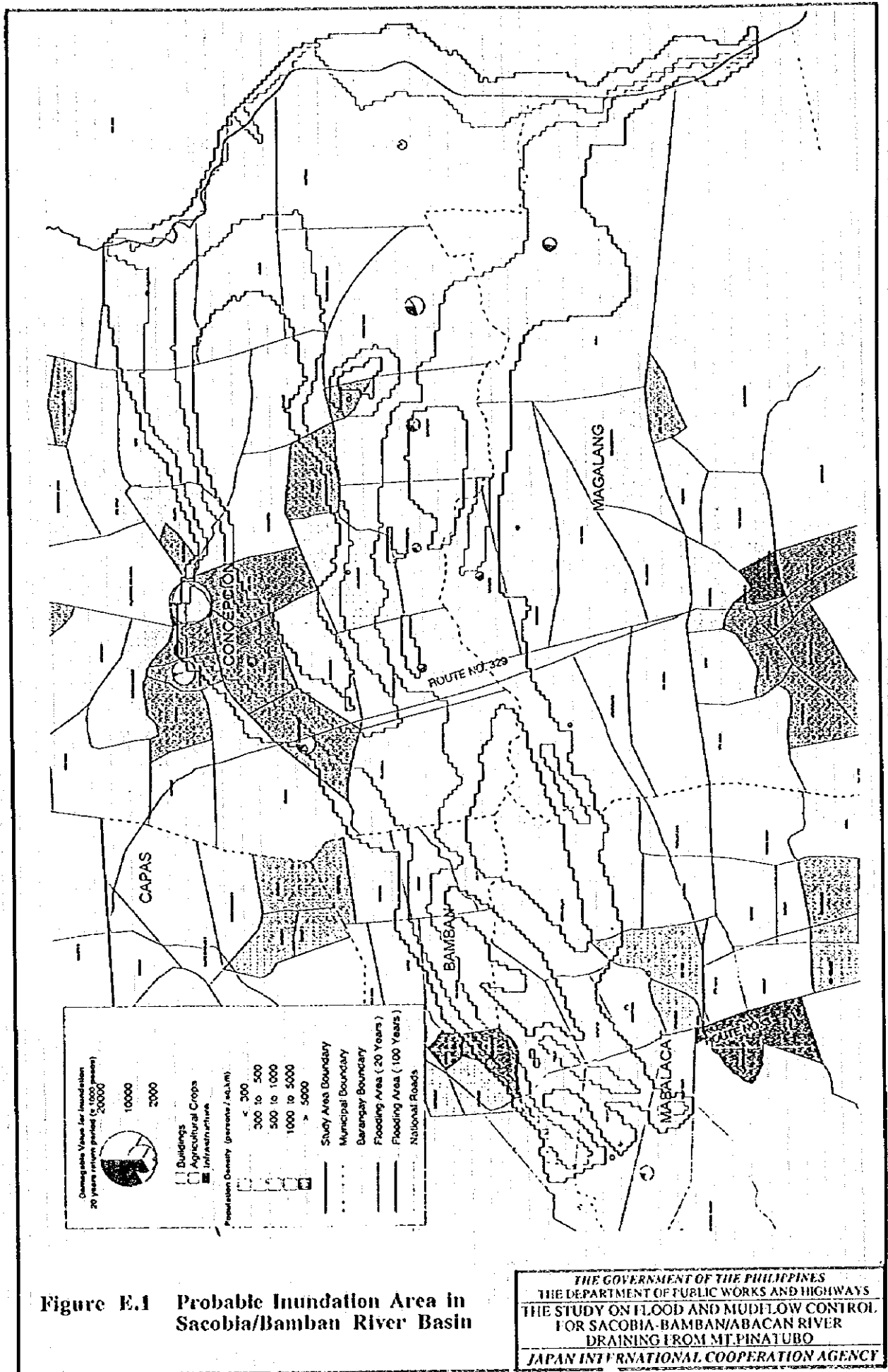
Average Annual Damage for 20-Year Return Period (Pesos million)

Building	Crops & Livestock		Evacuation & Loss of		Total
	Infrastructure	Cleanup Cost	GRDP		
58.45	23.68	16.39	9.17	7.70	115.37
51%	21%	14%	8%	7%	100%

Table E.27-2 Estimated Average Annual Damage of each Asset in Abacan River Basin

(1) Buildings							
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
Return Period	Average Annual Probability of Exceedence for Return Period	Events within Intervals	Flood Damage up to Indicated Return Period (Pesos 10 <sup>6</sup> )	Average Flood Damage (Pesos 10 <sup>6</sup> )	Flood Damage within Intervals (Pesos 10 <sup>6</sup> )	Average Annual Flood Damage up to Indicated Return Period (Pesos 10 <sup>6</sup> )	
2	0.5		60.59			0.00	
		0.3		94.15	28.24		
5	0.2		127.71			28.24	
		0.1		163.42	16.94		
10	0.1		211.13			45.19	
		0.05		265.90	13.26		
20	0.05		319.47			58.45	
		0.03		403.91	12.12		
50	0.02		488.34			70.57	
		0.01		605.26	6.05		
100	0.01		722.17			76.62	
(2) Agricultural Crops & Livestock							
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
2	0.5		25.73			0.00	
		0.3		39.98	11.99		
5	0.2		54.23			11.99	
		0.1		68.14	6.81		
10	0.1		82.05			18.81	
		0.05		97.08	4.85		
20	0.05		112.12			23.62	
		0.03		128.97	3.87		
50	0.02		145.82			27.53	
		0.01		164.90	1.65		
100	0.01		183.98			29.18	
(3) Infrastructures							
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
2	0.5		17.76			0.00	
		0.3		27.14	8.14		
5	0.2		36.52			8.14	
		0.1		47.21	4.72		
10	0.1		57.90			12.86	
		0.05		70.50	3.53		
20	0.05		83.10			18.81	
		0.03		99.34	3.00		
50	0.02		116.77			19.39	
		0.01		133.14	1.33		
100	0.01		149.50			20.72	
(4) Evacuation and Clean-up Costs							
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
2	0.5		10.30			0.00	
		0.3		15.56	4.67		
5	0.2		20.82			4.67	
		0.1		26.18	2.62		
10	0.1		31.54			7.29	
		0.05		37.77	1.89		
20	0.05		43.99			9.12	
		0.03		51.49	1.54		
50	0.02		58.98			10.72	
		0.01		70.59	0.71		
100	0.01		82.20			11.42	
(5) Loss of GDP							
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
2	0.5		8.64			0.00	
		0.3		13.06	3.92		
5	0.2		17.47			3.92	
		0.1		21.99	2.20		
10	0.1		26.50			6.12	
		0.05		31.73	1.59		
20	0.05		36.95			7.70	
		0.03		43.24	1.30		
50	0.02		49.53			9.00	
		0.01		59.28	0.59		
100	0.01		69.02			9.59	
(6) Total							
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
2	0.5		123.02			0.00	
		0.3		189.89	56.97		
5	0.2		266.76			56.97	
		0.1		332.94	33.29		
10	0.1		409.12			90.26	
		0.05		502.38	25.12		
20	0.05		585.63			115.59	
		0.03		727.54	21.83		
50	0.02		859.44			137.21	
		0.01		1033.16	10.33		
100	0.01		1206.87			147.54	

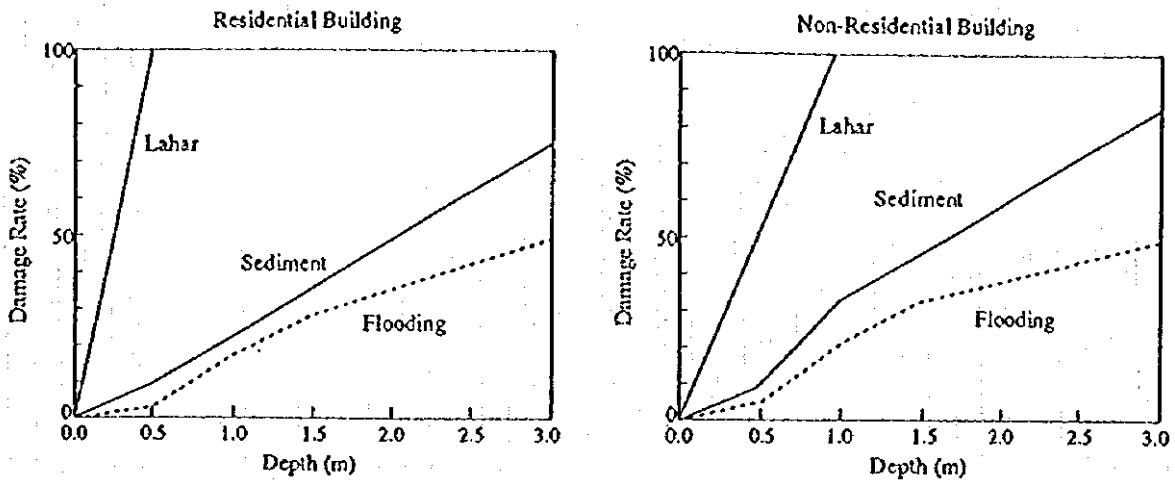
# ***FIGURES***



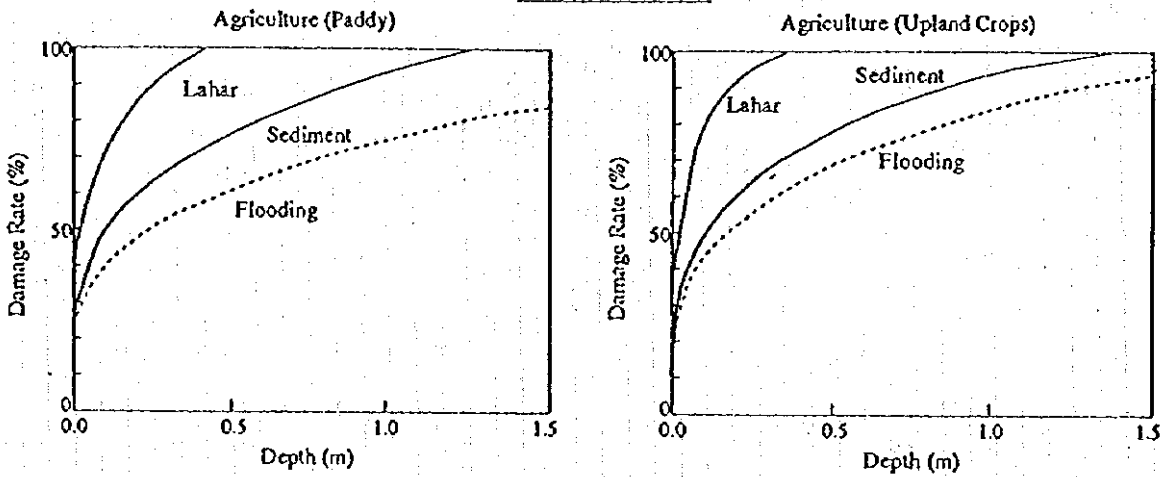
**Figure E.1 Probable Inundation Area in Sacobia/Bamban River Basin**



### Building



### Agriculture



### Infrastructure

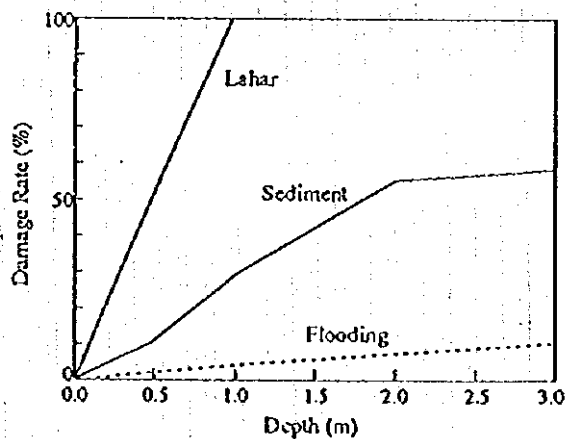
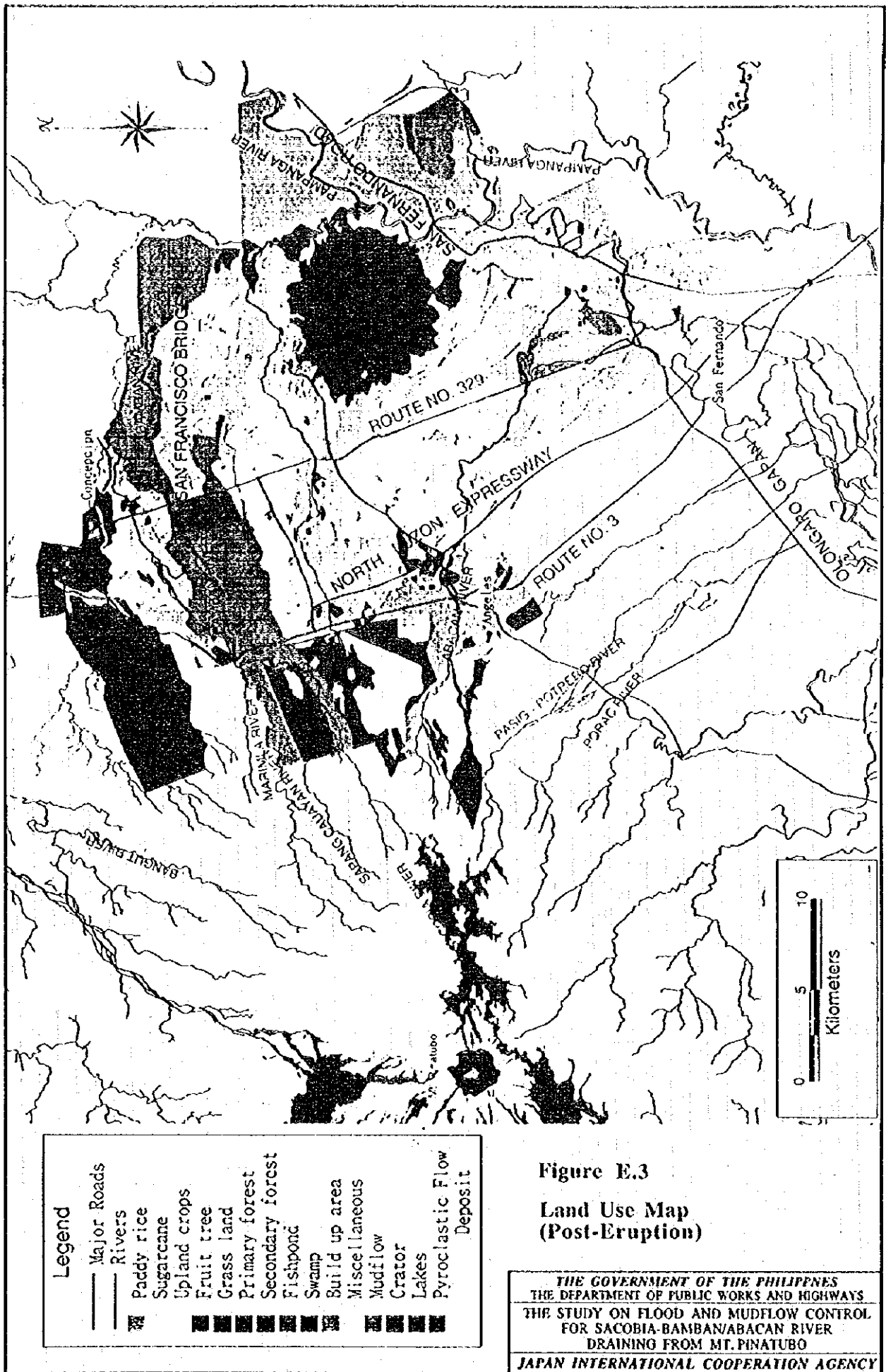
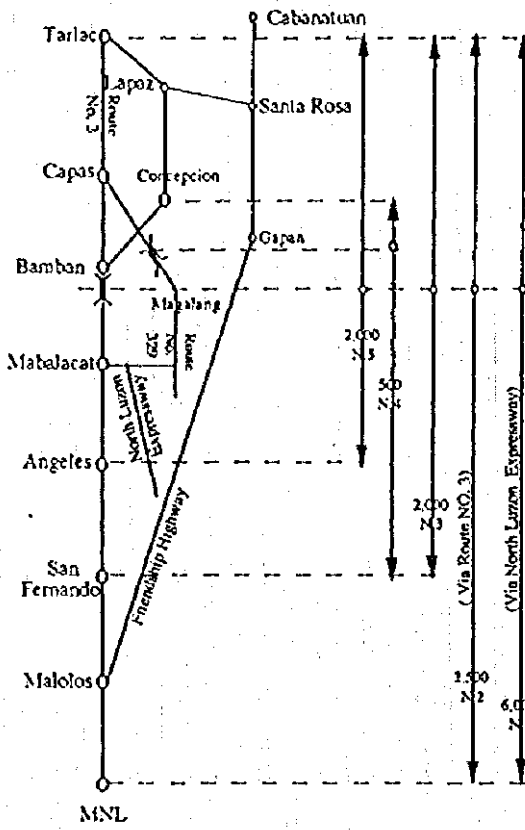


Figure E.2 Damage Curves for Properties

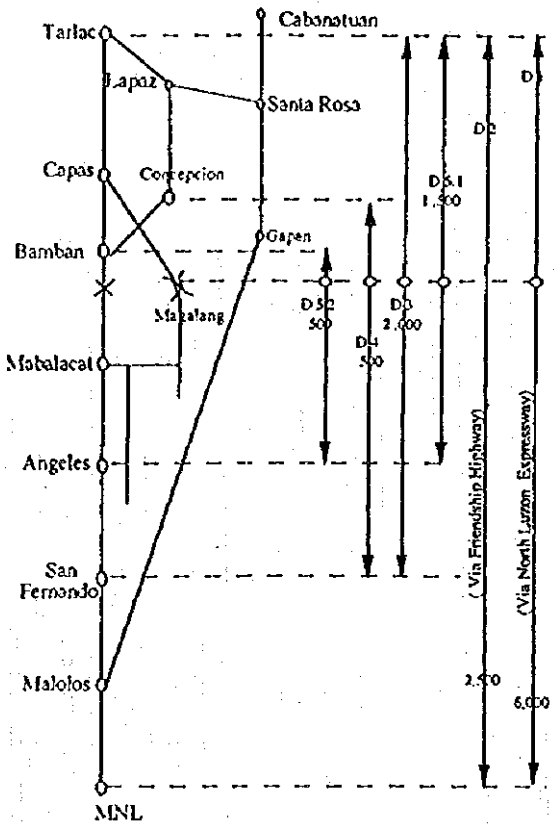
THE GOVERNMENT OF THE PHILIPPINES  
 THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS  
 THE STUDY ON FLOOD AND MUDFLOW CONTROL  
 FOR SACOBIA-BAMBAN/ABACAN RIVER  
 DRAINING FROM MT. PINATUBO  
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(1) "With Project" Conditions



(2) "Without Project" Conditions (11 months)



(3) "Without Project" Conditions (Flooding Period: 30 days)

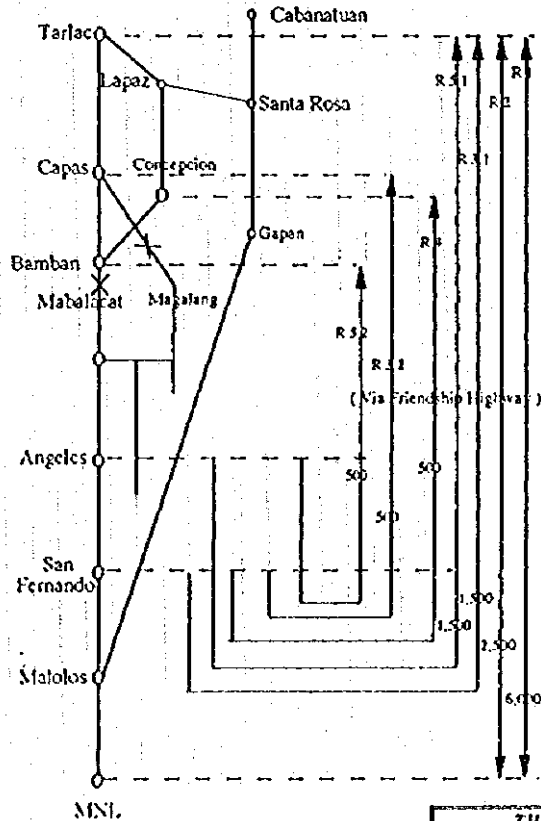
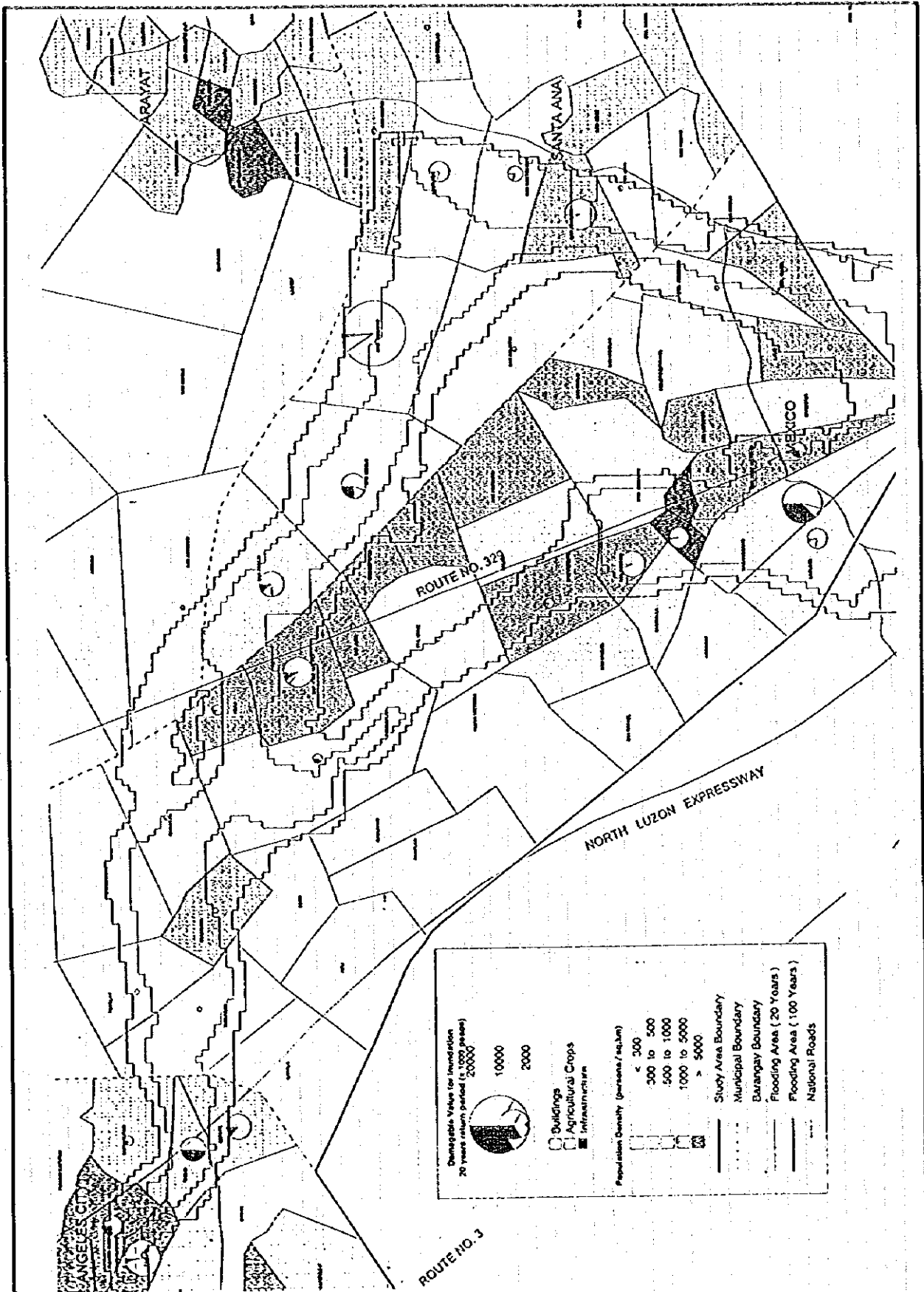


Figure E.4 Schematics of Detour Alternative Routes

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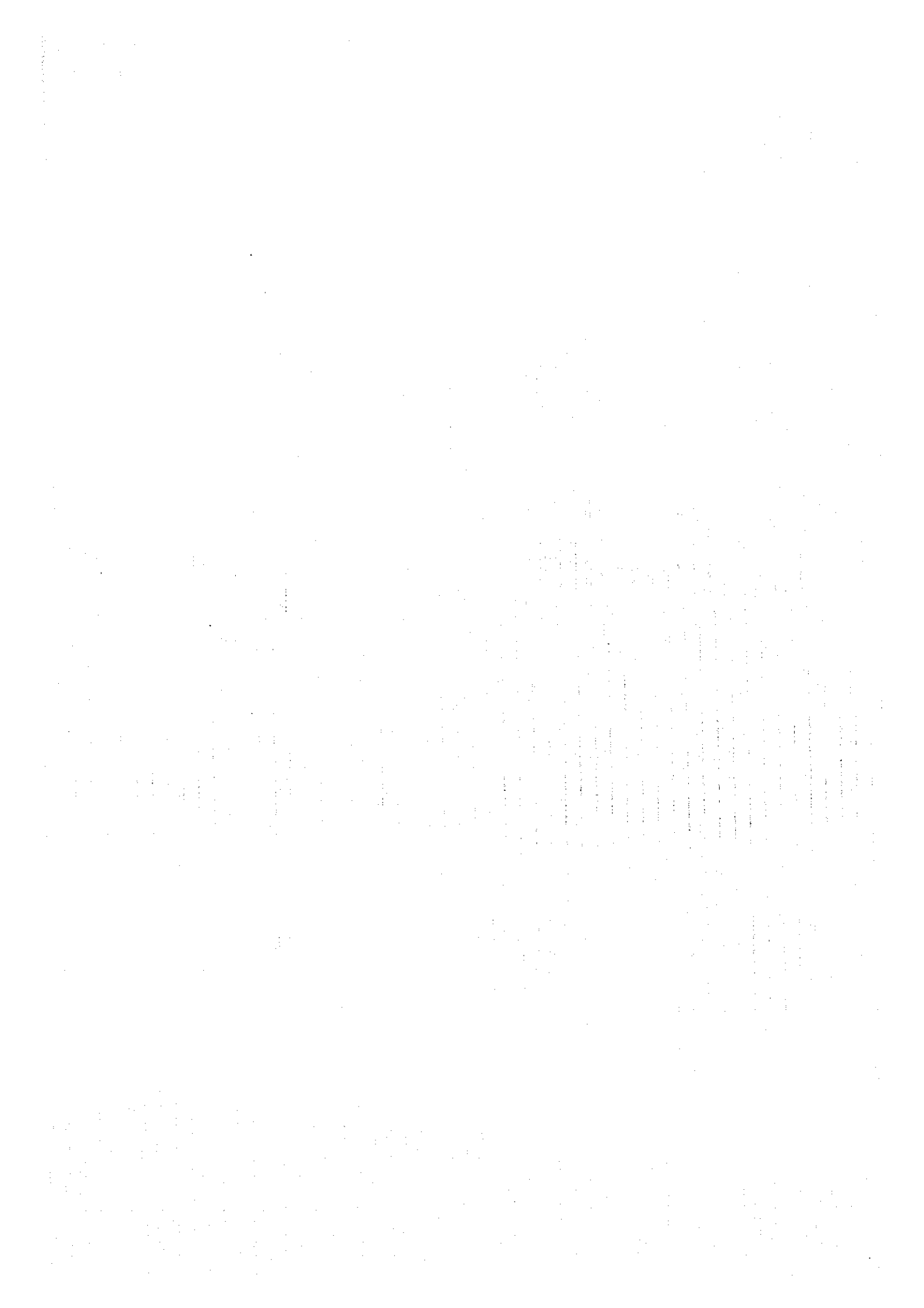
**Figure E.5 Probable Inundation Area in Abacan River Basin**

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