

(Ref.L.12). Local agencies began testing to determine property characteristics and potential construction applications.

Non cohesive debris flows and hyper-concentrated flows at Mt. Pinatubo are highly erosive on the basis of their observed ability to scour older deposits and to erode dikes. Likewise, the sandy deposits of flows are significantly more erodible than those either coarser or with more clay. Gravel-size fractions with a diameter of more than 2 mm, which would increase erosion resistance of dike materials, are mainly deposited in the river channel of the Sacobia River as the non cohesive flows lose competence and transform to more dilute flow. Thus, mainly erodible, sand-dominated deposits are locally available for dike construction in the downstream reach where the confinement of flood might be most required (Ref.L.11).

Lahar material test results shows that the aggregate now locally available can be used for the production of roller compacted concrete (RCC) as a construction material for the potential use of slope protection for diking system (Ref.L.12). The average property of materials is also mentioned as follows :

Construction Material Properties					
Property	Unit	Foundation			Embankment Compacted Lahar Material
		Rock	Granular Soil	Lahar Deposit	
Cohesion	kPa	690			
Angle of Internal Friction	degree		36	32	36
True Specific Gravity			2.4	2.4	2.4
Porosity	%		30	34	20
Saturated Unit Weight	kg/m ³		1,890	1,920	1,680
Allowable Bearing Stress	kg/m ²	150,000	50,000	29,000	1,980
Relative Density (Dr)			Dr>70	25<Dr<75	
Permeability	cm/s				10 ⁻⁴

Source : Ref.L.12

4.2 LAHAR-CEMENT MIXTURE TEST

Sampling of lahar materials was carried out in August 1994 at two points; (i) Lahar material which was used for dikes at San Francisco Bridge, and (ii) Lahar material which was used for embankment material of open dikes of sand pocket at immediate upstream of Route 329. Both materials were used for the dike embankment.

A compacted stabilized soil specimen was made in the laboratory on the basis of the following specifications; (i) Standard Practice for Making and Curing Soil-Cement Compression and Flexure Test Specimens in the Laboratory (ASTM D1632-87) and (ii) Standard Method for Making and Curing Soil-Cement Compression and Flexure Test Specimens in the Laboratory (ASTM D1632-63).

Compressive strength of molded cylinders and flexural strength of molded beam tests were carried out under the following conditions;

Items	Cases	Remarks
Water Contents	1 case	natural
Cement Contents	3 cases	10, 15 and 20%
Curing Period	2 cases	3 and 7 days

The results shows that the compressive strength of 28 to 32 kg/cm² and the flexural strength of 13 to 16 kg/cm² for 7 days can be expected under the cement fraction of weight of 10%.

REFERENCES

- | Ref. No. | Title |
|----------|--|
| L.1 | PHIVOLCS/UNESCO, "Lahar Studies", 1994 |
| L.2 | T.C. Pierson, A.S. Daag, P.J.D. Reyes, T. Regalado, R. Solidum, and B. Tubianosa, "Flow and Deposition of Post-eruption Hot Lahars on the East Side of Mt. Pinatubo, July - October, 1991 (DRAFT)", PHIVOLCS |
| L.3 | Major J.J., et al., "Watershed Disturbance and Lahars on the East Side of Mount Pinatubo during the Mid-June 1991 Eruption", USGS/PHIVOLCS, 1992 |
| L.4 | Umbal J.V. and Rodolfo K.S., "The 1991 Lahars of Southwestern Mount Pinatubo and Evolution of the Lahar-Dammed Mapanuepe Lake", USGS/PHIVOLCS, 1992 |
| L.5 | Rodolfo K.S., et al., "Two Years of Lahars on the Western Flank of Mount Pinatubo, Philippine: Initiation, Flow Processes, Deposits, and Attendant Geomorphic and Hydraulic Changes", 1992 |
| L.6 | BSWM, "Physico-Chemical Mineralogical and Hydrological Characterization of Volcanic Ash and Lahar and their Utilization and Management for Agricultural Crops", 1992 |
| L.7 | Tokudome, et al., "Extent and Some Properties of Mt. Pinatubo's ashfall over Agricultural Land (JICA Technical Report on the Soil Research and Development Center Project, BSWM)", 1994 |
| L.8 | PHIVOLCS/USGS, "Serious but Rapidly Diminishing Hazards at Mount Pinatubo", August 1994. |
| L.9 | R. Torres, S. Self, M. Martinez, "Secondary Pyroclastic Flows from the 15 June 1991 Ignimbrite of Mount Pinatubo (DRAFT)", PHIVOLCS |
| L.10 | R.A. Arboleda, A.S. Daag, P.J.D. Reyes, M.L. Martinez, T.M. Regalado, "1993 lahars on the Eastside Drainages of Pinatubo Volcano: An Overview (DRAFT)", PHIVOLCS |
| L.11 | Scott, K.M., "Channel and Sedimentation Responses to Large Volumes of 1991 Volcanic Deposits on the East Flank of Mount Pinatubo", USGS/PHIVOLCS |
| L.12 | USACE, "Mount Pinatubo Recovery Action Plan: Long Term Report: Eight River Basins, Republic of the Philippines, (Volume II-Technical Appendices)", March 1994 |

TABLES

Table L.1 Physical Properties of Lahar Dip Samples

Sample	Unit	Bamban	Sacobia River			Abacan River		
		Low Flow	Lahar (debris)	Lahar (debris)	Lahar (debris)	Lahar (debris)	Lahar (debris)	Lahar (debris)
Sampling date in 1991		Sep.08	Aug.20	Aug.20	Aug.20	Sep.04	Sep.04	Sep.04
Distance from cardela rim	km	37	17	17	28	18	18	27
Wet sample bulk density	g/cm ³	1.08	2.02		1.66	1.75	1.59	
Particle density (whole sample)	g/cm ³	1.93	2.48		2.19	2.45	2.08	
Particle density (8mm < d < 16 mm)	g/cm ³		1.47	1.00	0.96	0.97	1.04	0.92
Sediment concentration (by volume)	%	9	7		55	51	55	
Sediment concentration (by weight)	%	16	85	79	73	72	72	44
Material								
gravel	%	0.0	20.3	17.9	42.0	23.4	10.4	21.2
sand	%	43.8	63.5	65.8	45.1	62.2	74.0	59.7
silt	%	47.5	14.3	14.2	11.4	12.9	13.6	17.1
clay	%	8.7	1.9	2.1	1.5	1.5	2.0	2.0
Slurry temperature	oC		50	50	50	48	48	
Mean grain size (Mz)	mm	5.68	1.18	1.38		0.67	1.71	1.51

Source : "Flow and Deposition of Post-Eruption Hot Lahars on the East Side of Mt. Pinatubo July-October, 1991", Pierson et al, PHIVOLCS

Table L.2 Chemical Properties of Lahar Deposit

LOCATION	pH	OM (%)	EXCHANGEABLE BASES (meq/100g soil)				CEC (meq/ 100g soil)	BSP (%)	P (ppm)	SO ₄ (ppm)	MICRONUTRIENTS (ppm)			
			Ca	Mg	Na	K					Zn	Cu	Fe	Mn
ABACAN RIVER														
1. Sapalibutad, Angeles City	6.4	0.52	1.00	0.18	0.03	0.08	2.39	53.97	13.20	0	0.60	5.60	41.80	4.00
2. Sapalibutad, Angeles City	6.2	0.19	0.85	0.17	0.03	0.05	3.80	28.95	6.00	101	0.20	5.40	17.60	3.20
3. Capaya Is., Angeles City	5.9	0.09	0.70	0.26	0.07	0.06	2.69	40.52	0.50	297	0.20	2.80	6.80	2.00
4. Sapalibutad, Angeles City	6.5	0.14	0.65	0.10	0.03	0.03	1.91	42.40	0.30	0	0.40	2.88	5.60	1.40
5. San Juan, Magalang	6.4	0.02	1.64	0.15	0.07	0.04	1.90	100.00	5.23	0	0.25	2.88	5.28	7.93
6. Purok 4, S. Bato	6.6	T	1.08	0.03	0.05	0.02	1.18	100.00	1.55	0	0.82	2.45	35.91	8.98
SACOBIA-BAMBAN														
1. Bamban River	6.5	0.14	1.05	0.03	0.06	0.05	4.43	26.86	0.10	0	0.20	2.20	4.40	1.00
2. Culatingan	6.4	0.19	0.70	0.26	0.04	0.09	3.25	33.54	4.90	0	0.60	4.80	28.60	0.80
3. Culatingan	6.2	1.46	2.60	1.10	0.11	0.34	6.35	65.35	8.80	0	1.20	15.40	92.40	22.00
4. Dolores, Magalang	5.7	0.02	1.75	0.08	0.14	0.06	3.65	55.62	0.10	830	0.20	2.20	6.00	13.20
5. San Vicente, Concepcion	6.7	0.38	3.56	0.39	0.21	0.26	9.37	47.17	9.71	58	0.27	12.98	142.78	53.53

Table L.3 Physical Properties of Lahar Deposits

LOCATION	PERCENT		TEXTUAL GRADE	BULK DENSITY (gm/cc)	AVAILABLE MOISTURE (%)	HYDRAULIC CONDUCTIVITY (cm/sec)
	Sand	SiH				
ABACAN RIVER						
1. Sapalibutad, Angeles City	86.4	5.6	LS	0.98	11.58	2.6×10^{-2} Very Fast
2. Sapalibutad, Angeles City	86.4	6.6	LS		11.88	
3. Capaya	87.4	4.6	LS	1.83	6.36	9.7×10^{-4} Medium
4. Sapalibutad, Angeles City	95.4	0.6	S	1.40	6.12	6.5×10^{-2} Very Fast
SACOBIA-BAMBAN RIVER						
1. Bamban River	86.4	4.6	LS	1.69	8.04	2.0×10^{-2} Fast
2. Culatingan River	80.4	10.6	SL	1.78	1.89	1.2×10^{-4} Medium
3. Culatingan River	20.4	53.6	SiL			
4. Dolores, Magalang	82.4	9.6	SiL		23.70	

Table L.4 Lahar Material Survey Results

ABACAN RIVER

Diameter (mm)	Cumulative % Passing						Average
	ABA-1	ABA-2	ABA-3	ABA-4	ABA-5	ABA-6	
37.50	100.00	100.00	100.00	100.00	100.00	98.24	99.71
25.00	100.00	100.00	100.00	100.00	100.00	96.28	99.38
19.00	100.00	98.00	99.53	100.00	99.17	95.89	98.77
12.50	100.00	96.00	98.67	98.31	98.48	94.65	97.69
9.50	98.70	93.73	98.22	96.30	97.96	94.27	96.53
4.75	95.56	89.13	94.44	88.67	94.08	92.55	92.41
2.36	88.64	81.04	89.28	77.78	88.54	90.46	85.96
1.18	66.31	65.49	67.40	56.53	71.86	85.91	68.92
0.60	34.00	41.87	30.01	31.42	39.82	71.17	41.38
0.30	14.94	18.32	8.73	15.41	13.90	35.19	17.75
0.15	3.54	5.15	1.05	4.10	2.97	5.81	3.77
0.08	3.32	4.73	0.71	3.60	2.29	5.41	3.34

BAMBAN RIVER

Diameter (mm)	Cumulative % Passing								Average
	BAM-1	BAM-2	BAM-3	BAM-4	BAM-5	BAM-6	BAM-7	BAM-8	
37.50	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
25.00	100.00	100.00	100.00	99.00	100.00	95.00	100.00	100.00	99.25
19.00	100.00	99.00	100.00	95.00	100.00	94.00	100.00	100.00	98.50
12.50	99.45	94.13	100.00	92.00	100.00	92.00	97.00	99.00	96.70
9.50	98.13	89.68	99.75	88.16	99.48	89.70	94.23	96.85	94.50
4.75	95.71	71.73	98.24	77.88	97.58	83.75	82.09	83.66	86.33
2.36	91.89	54.24	92.94	65.56	93.97	73.37	63.01	63.74	74.84
1.18	80.33	39.65	75.99	52.41	82.65	56.88	42.73	44.93	59.45
0.60	45.22	22.88	45.32	44.27	57.34	44.41	28.33	31.10	39.86
0.30	21.61	6.73	19.08	28.21	27.73	25.14	9.76	13.34	18.95
0.15	4.15	1.08	4.37	12.42	5.49	8.40	2.96	1.31	5.02
0.08	4.01	0.56	1.81	10.07	2.89	5.06	1.90	0.99	3.41

SACOBIA RIVER

Diameter (mm)	Cumulative % Passing			Average
	SAC-1	SAC-2	SAC-3	
37.50	100.00	100.00	100.00	100.00
25.00	98.40	100.00	100.00	99.47
19.00	98.03	100.00	100.00	99.34
12.50	97.59	99.82	99.50	98.97
9.50	96.85	99.44	98.23	98.17
4.75	94.26	96.52	95.33	95.37
2.36	89.07	90.44	89.20	89.57
1.18	73.97	70.76	75.88	73.54
0.60	38.60	41.47	51.07	43.71
0.30	9.35	14.63	20.51	14.83
0.15	1.24	2.03	2.49	1.92
0.08	0.72	1.06	0.98	0.92

SUMMARY

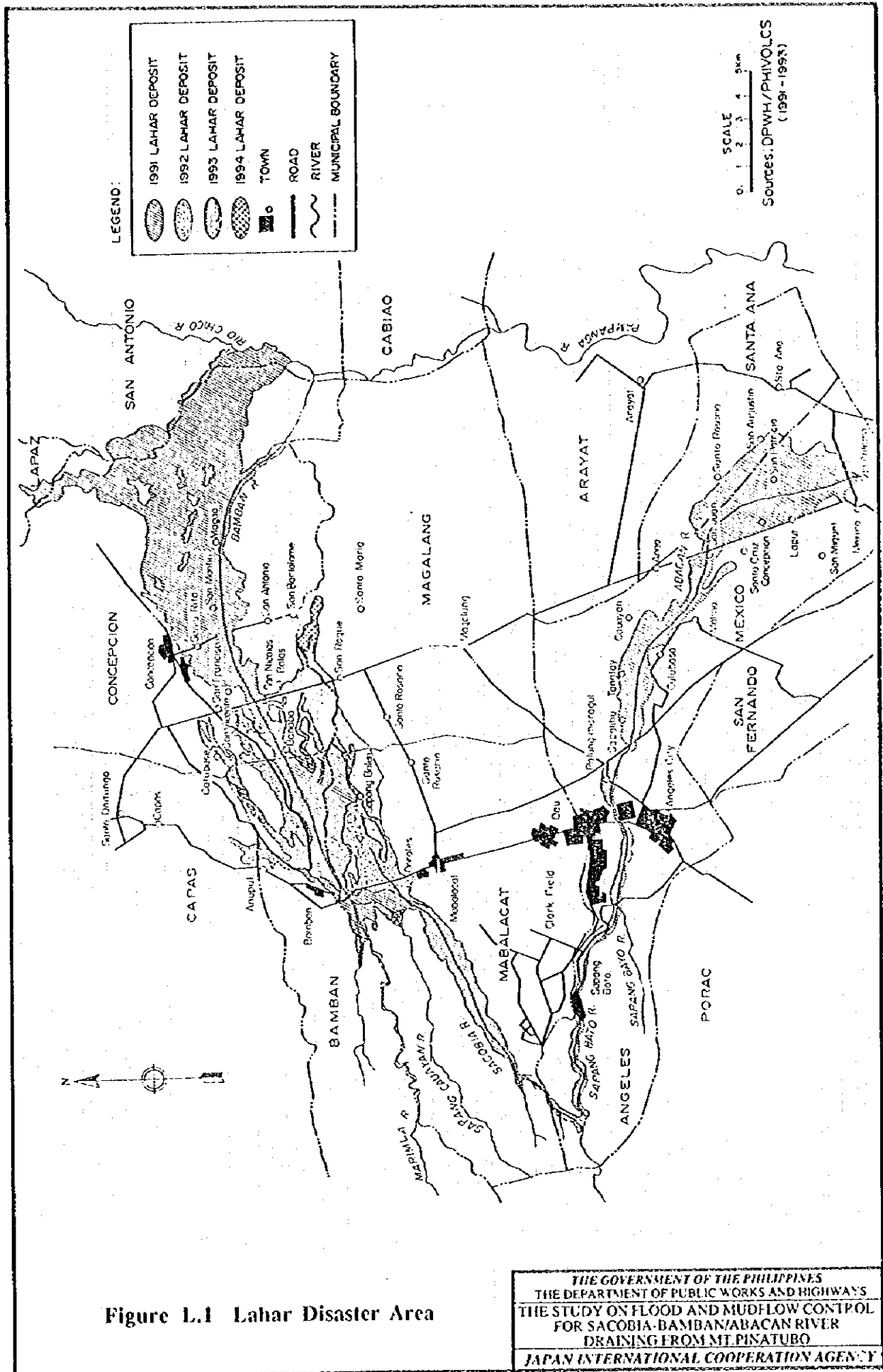
Diameter (mm)	Cumulative % Passing			Total Average
	Abacan	Bamban	Sacobia	
37.50	99.71	100.00	100.00	99.90
25.00	99.38	99.25	99.47	99.37
19.00	98.77	98.50	99.34	98.87
12.50	97.69	96.70	98.97	97.79
9.50	96.53	94.50	98.17	96.40
4.75	92.41	86.33	95.37	91.37
2.36	85.96	74.84	89.57	83.46
1.18	68.92	59.45	73.54	67.30
0.60	41.38	39.86	43.71	41.65
0.30	17.75	18.95	14.83	17.18
0.15	3.77	5.02	1.92	3.57
0.08	3.34	3.41	0.92	2.56

Table L.5 Lahar-Cement Mixture Test

(Unit:kg/cm²)

Lahar-Cement fraction by weight	Sampling Site			
	Sand Pocket		San Francisco Bridge	
	3 days	7 days	3 days	7 days
Compressive Strength of Molded Lahar-Cement Cylinders				
10 %	13	28	25	32
15 %	33	44	21	23
20 %	40	51	28	44
Flexural Strength of Molded Lahar-Cement Beam				
10 %	10	13	10	16
15 %	16	23	28	38
20 %	21	26	26	28

FIGURES



Flood Discharge during Breakout of Mapanuepe Lake

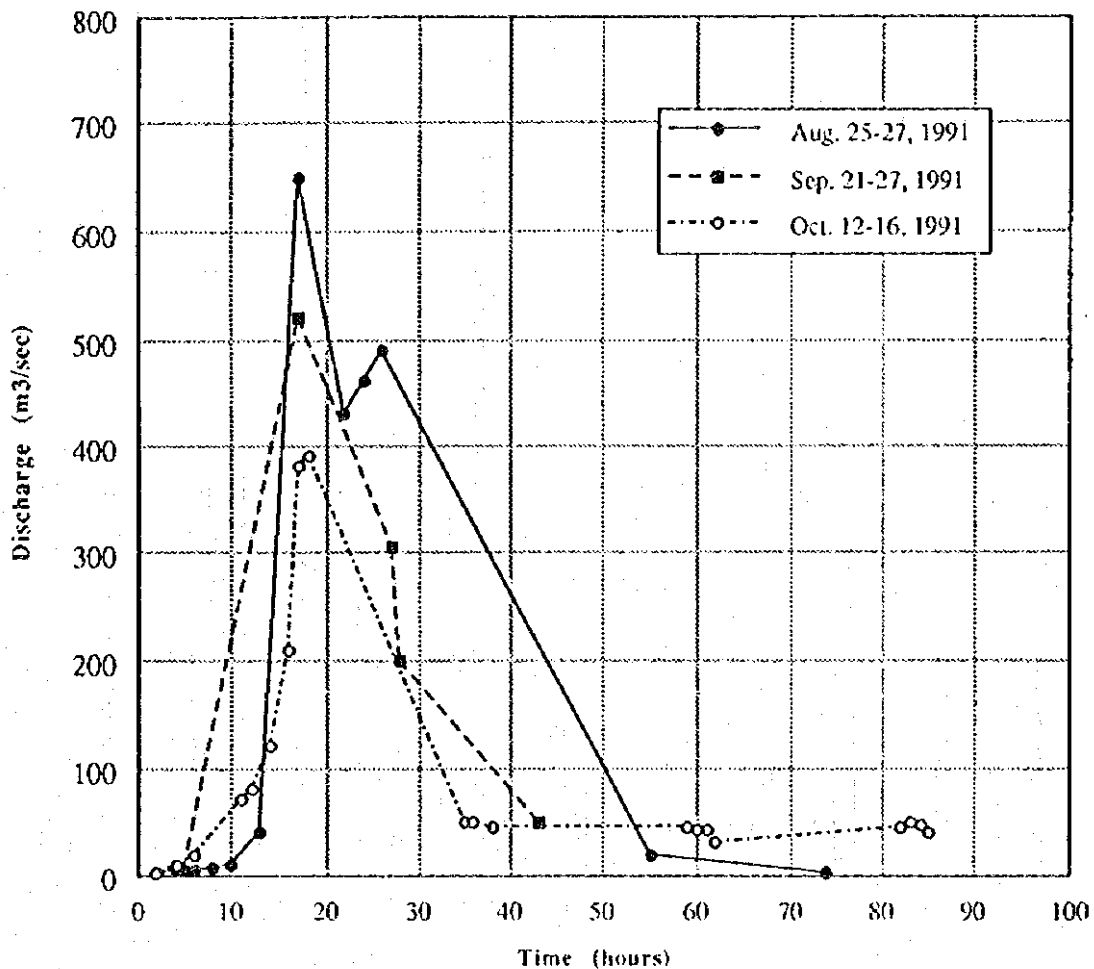
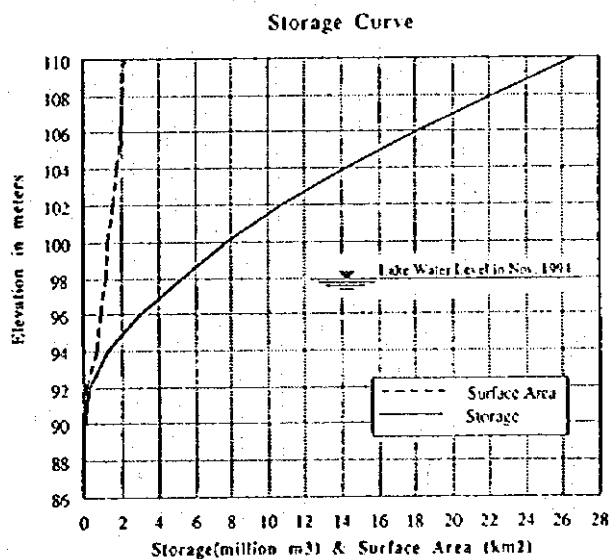
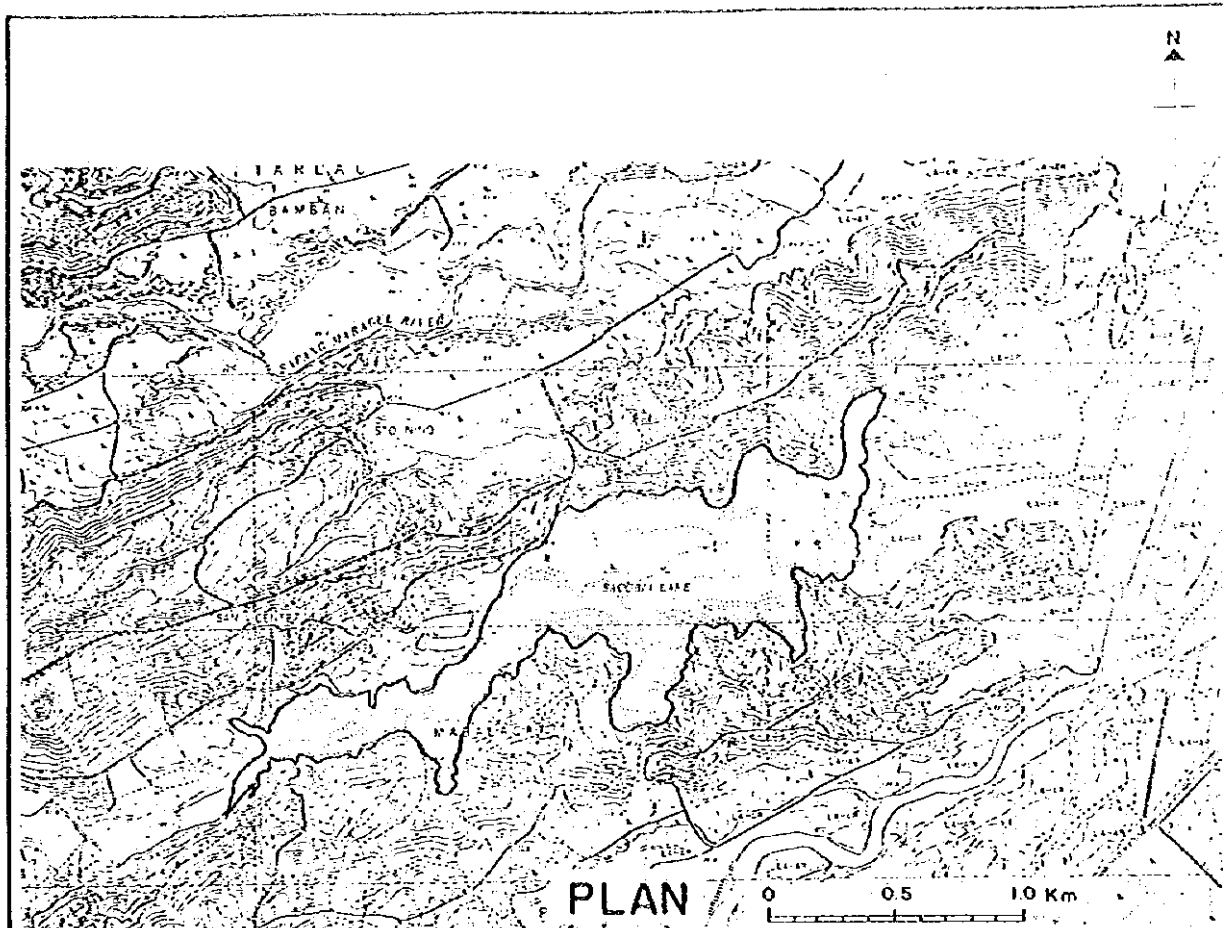


Figure L.2 Flood Hydrograph during Breakout of Mapanuepe Lake

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
 JAPAN INTERNATIONAL COOPERATION AGENCY



Water Level (El,m)	Surface Area (km ²)	Storage (million m ³)
110	2.229	26.819
108	2.132	22.338
106	2.002	18.254
104	1.847	14.405
102	1.679	10.879
100	1.336	7.864
98	1.225	5.303
96	1.001	3.077
94	0.737	1.339
92	0.210	0.392
90	0.077	0.105
88	0.014	0.014
86	0.000	0.000

Figure L.3 Dammed Lake in Sapang Cauayan River

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
 JAPAN INTERNATIONAL COOPERATION AGENCY

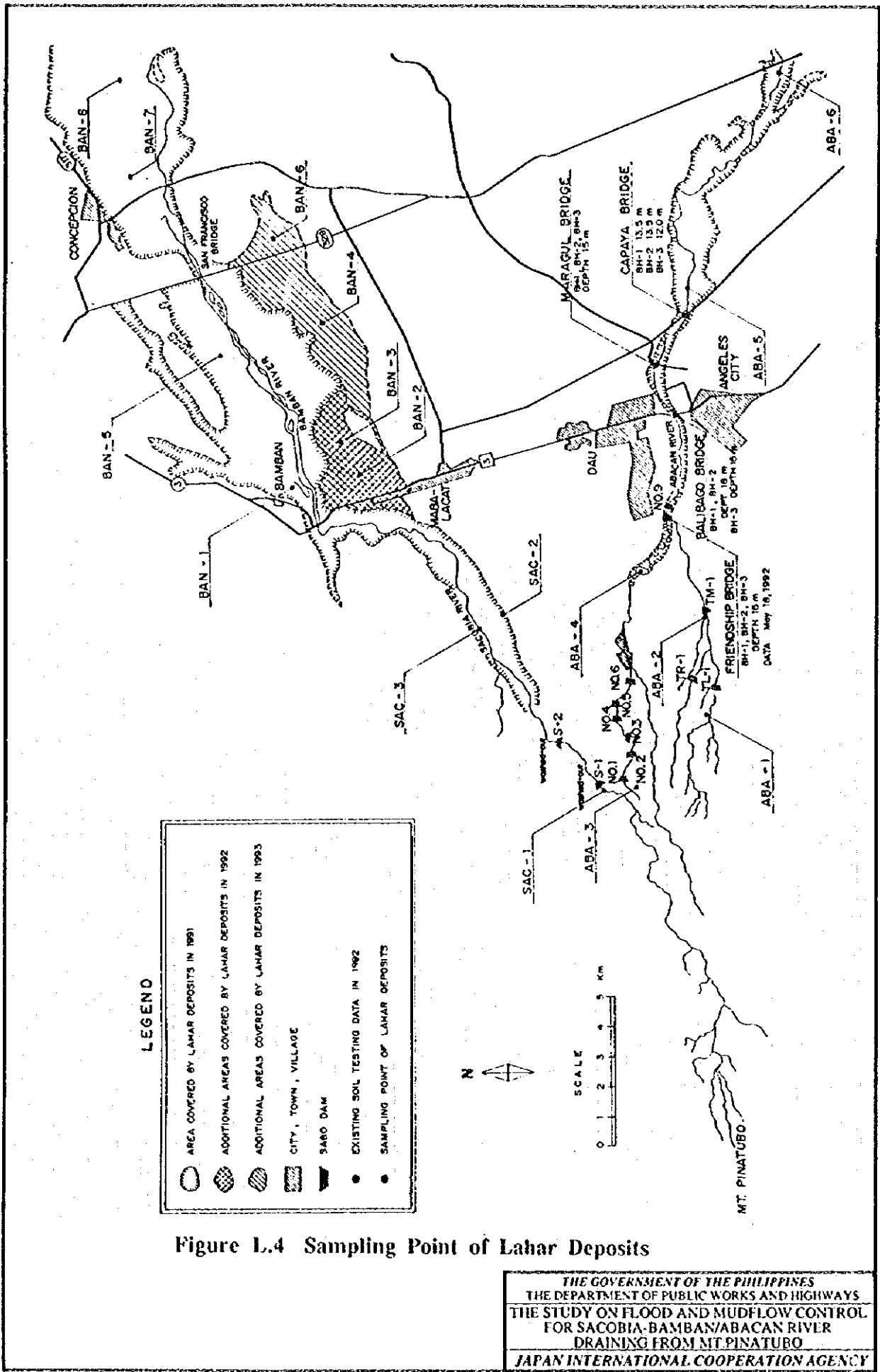


Figure L.4 Sampling Point of Lahar Deposits

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
 JAPAN INTERNATIONAL COOPERATION AGENCY

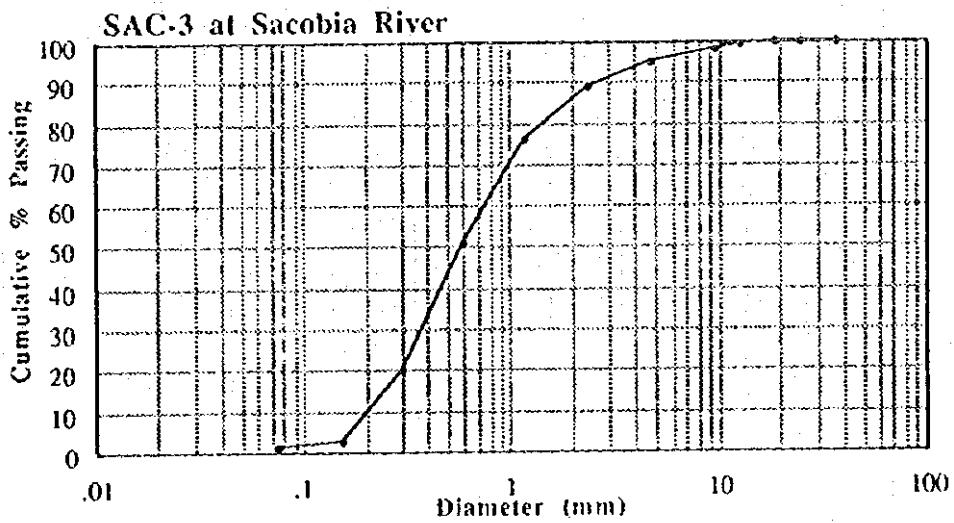
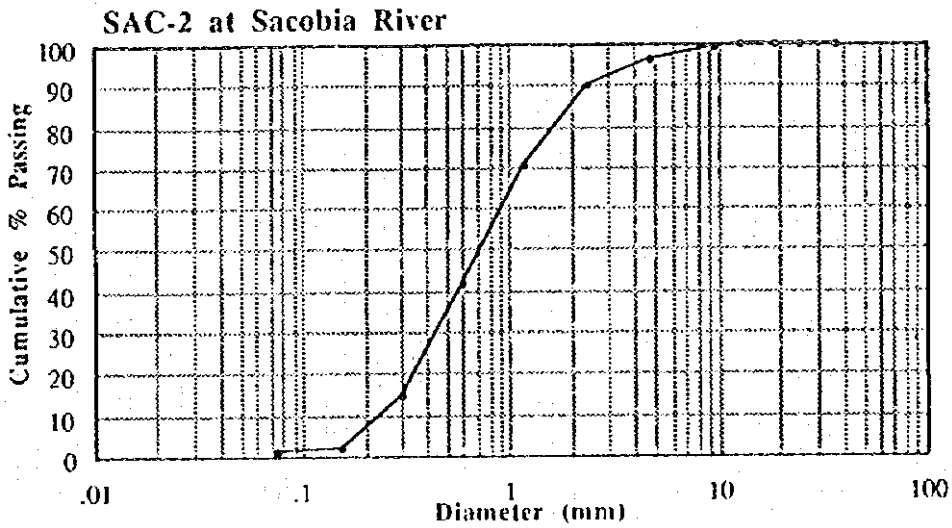
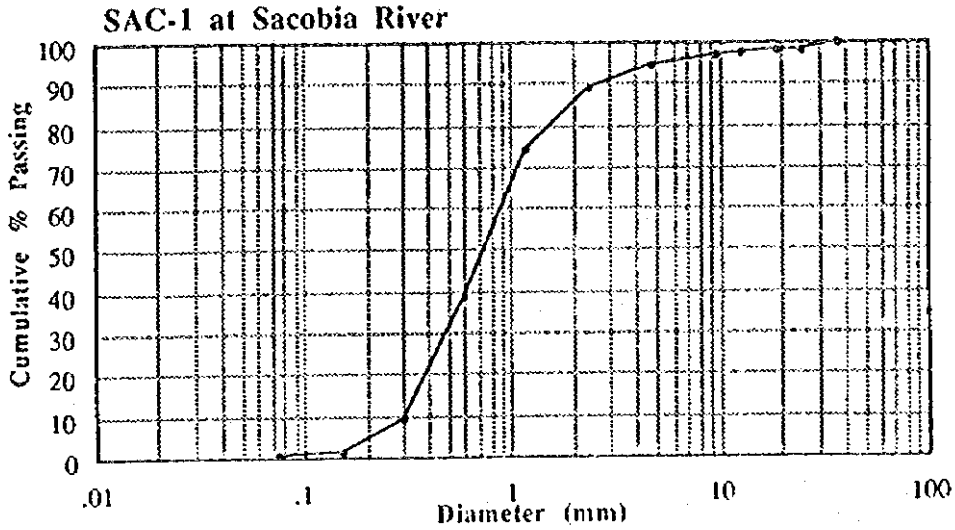


Figure L.5
Grain Size Distribution of Lahar Deposits
in Sacobia River

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
 JAPAN INTERNATIONAL COOPERATION AGENCY

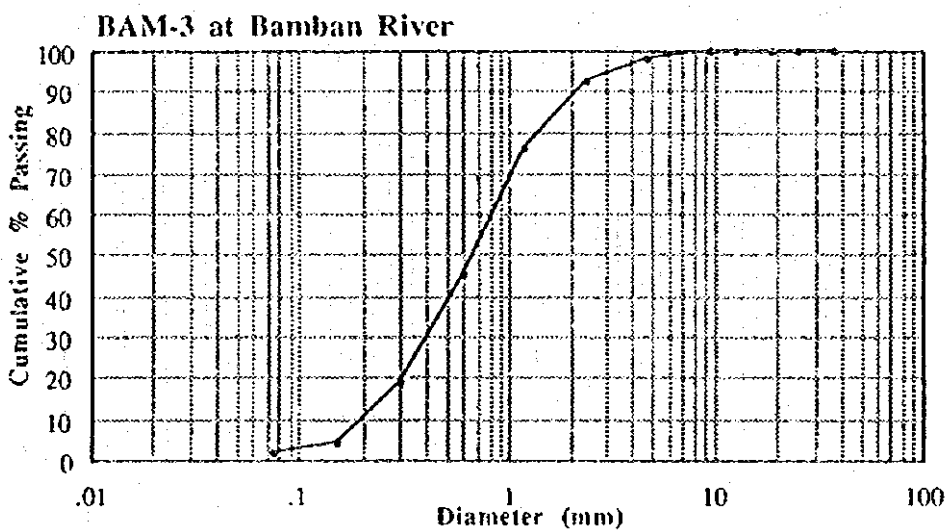
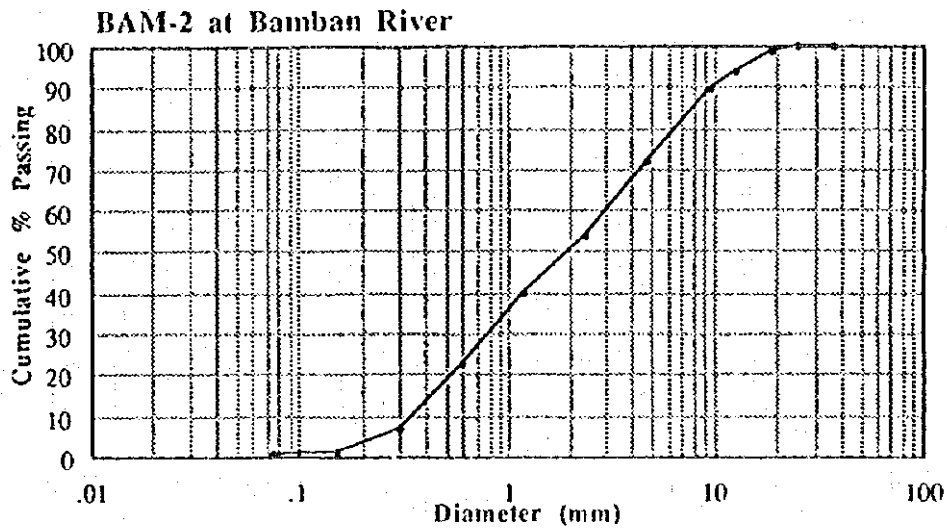
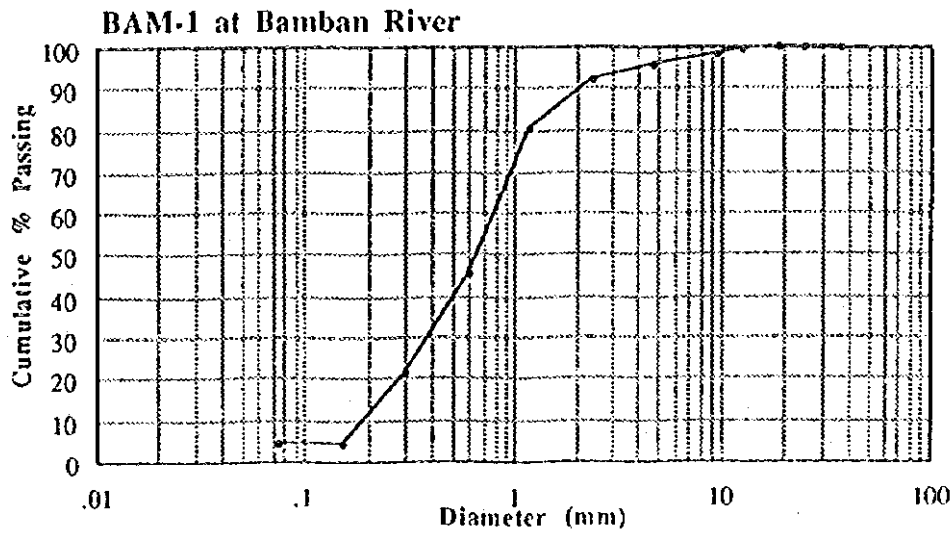


Figure L.6
Grain Size Distribution of Lahar Deposits
in Bamban River (1/3)

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
 JAPAN INTERNATIONAL COOPERATION AGENCY

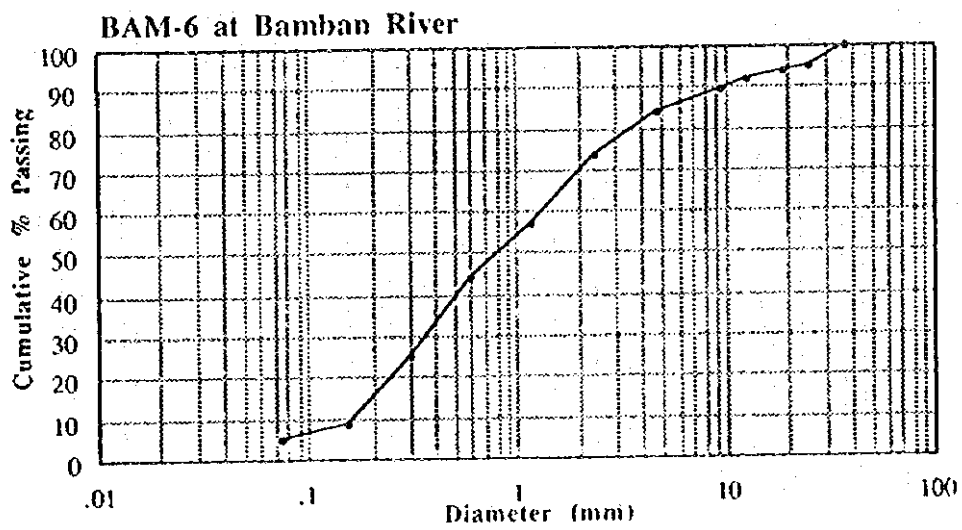
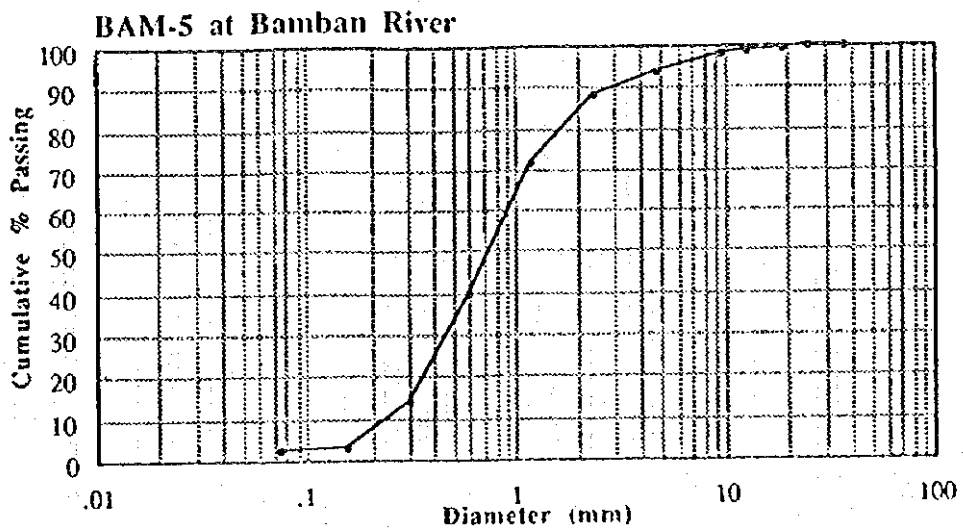
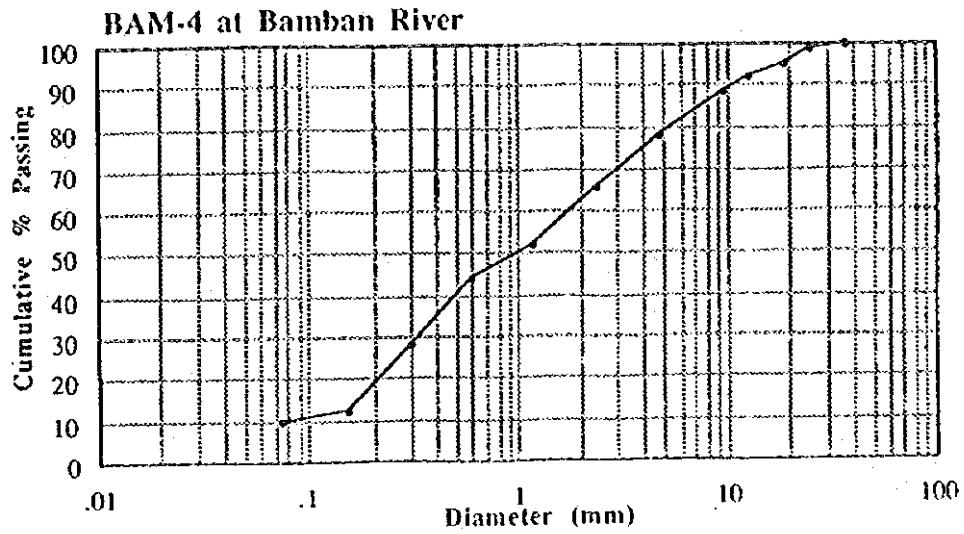


Figure L.6
Grain Size Distribution of Lahar Deposits
in Bamban River (2/3)

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
 JAPAN INTERNATIONAL COOPERATION AGENCY

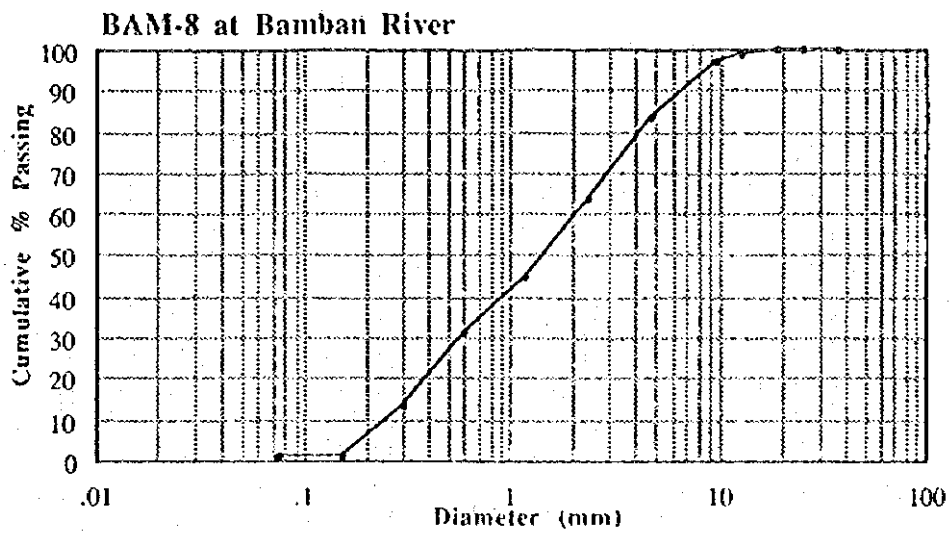
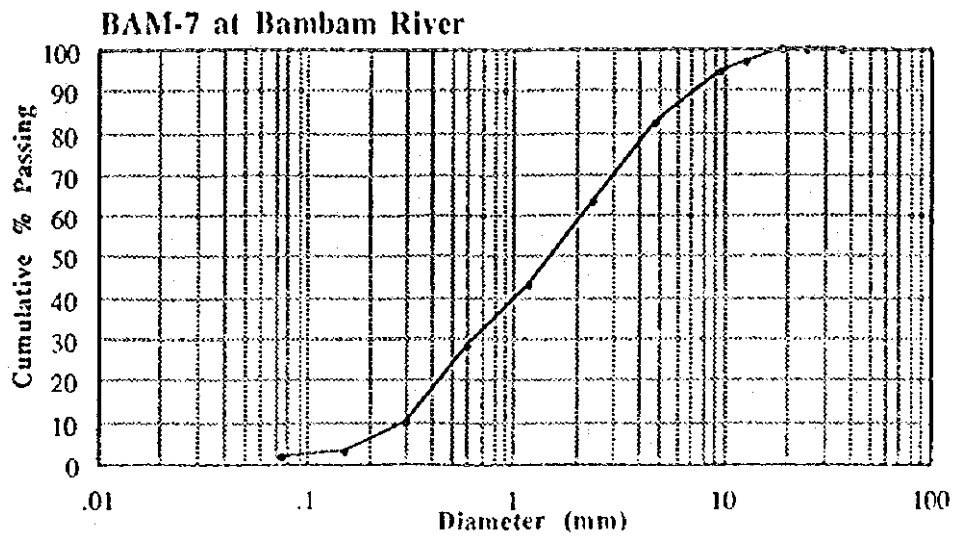


Figure L.6
Grain Size Distribution of Lahar Deposits
in Bamban River (3/3)

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
 JAPAN INTERNATIONAL COOPERATION AGENCY

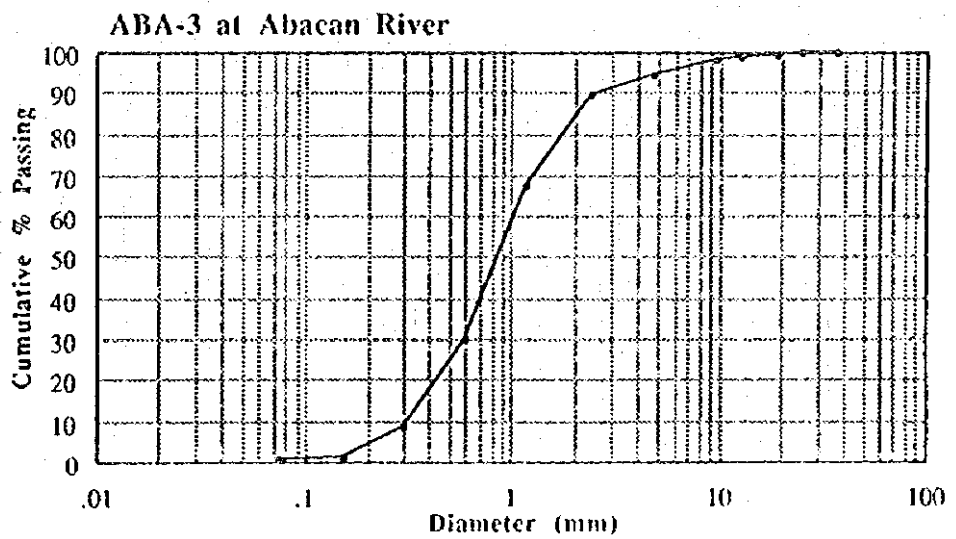
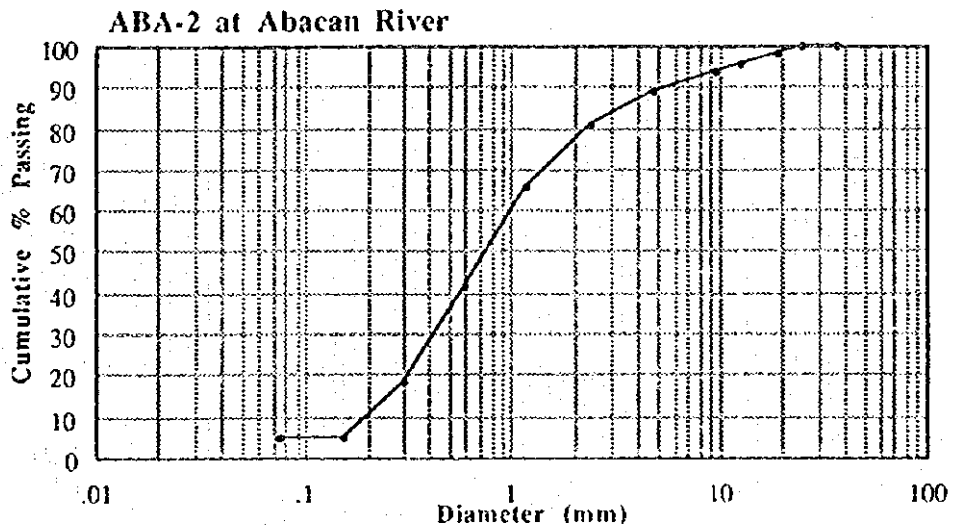
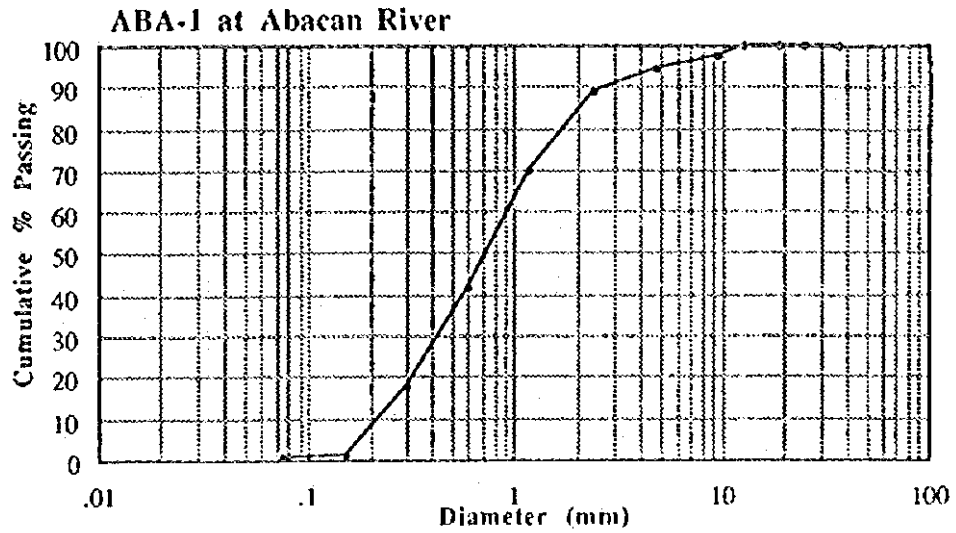


Figure L.7
Grain Size Distribution of Lahar Deposits
in Abacan River (1/2)

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
 JAPAN INTERNATIONAL COOPERATION AGENCY

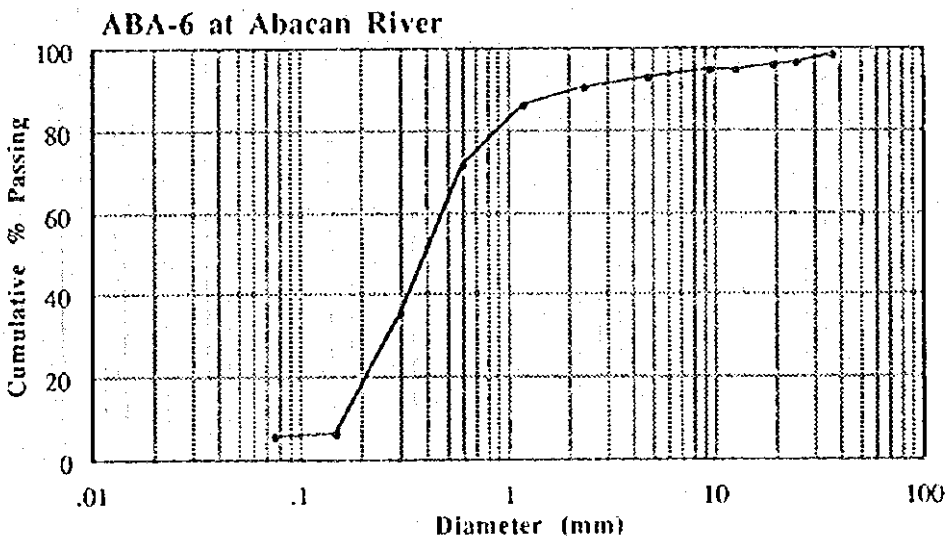
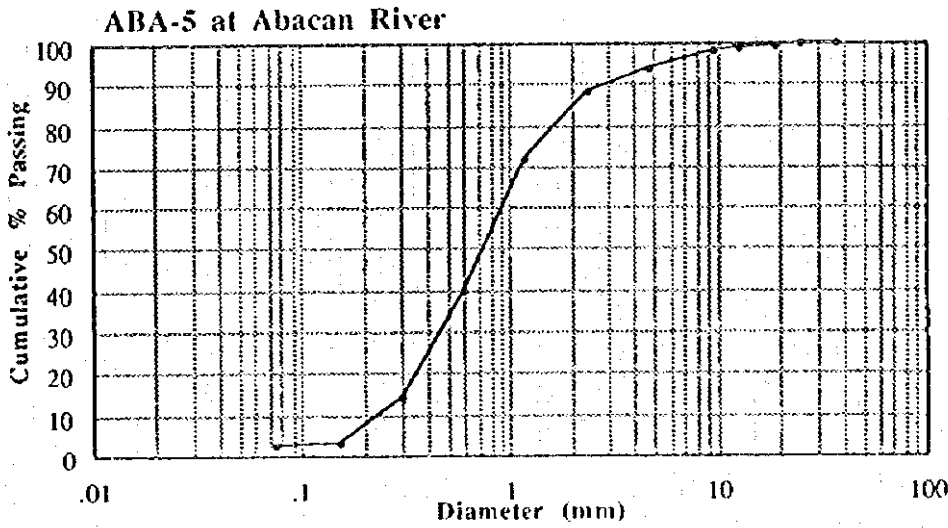
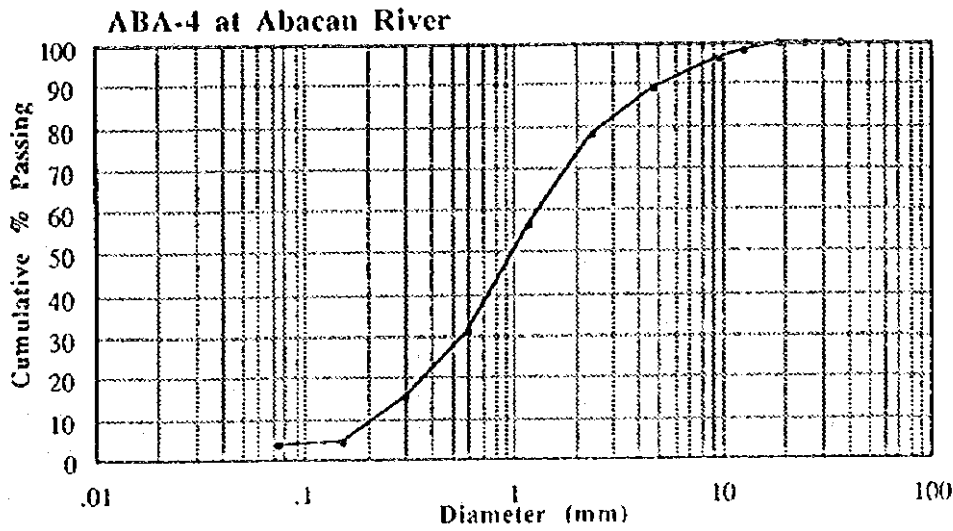
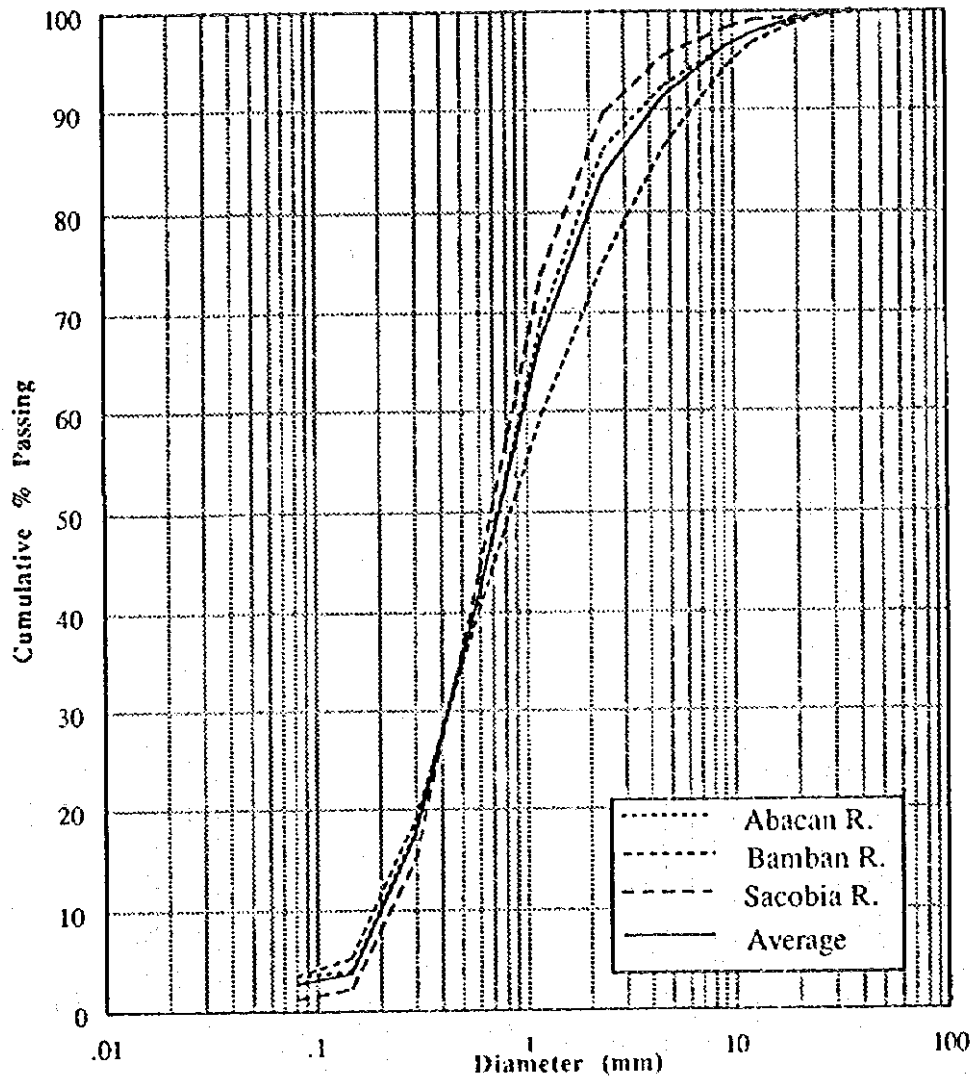


Figure L.7
Grain Size Distribution of Lahar Deposits
in Abacan River (2/2)

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
 JAPAN INTERNATIONAL COOPERATION AGENCY

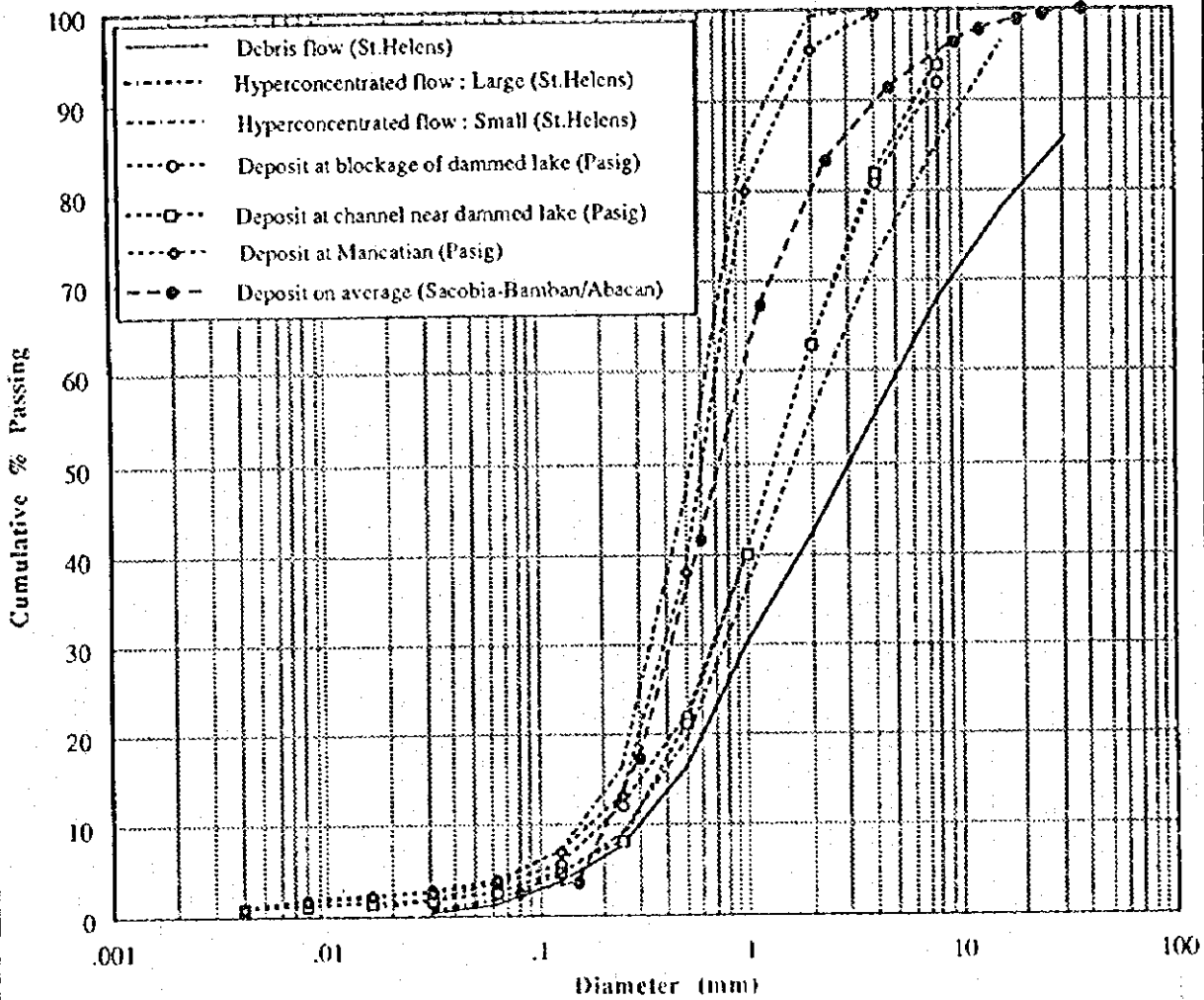


Cumulative % Passing			Total
Abacan	Bamban	Sacobia	Average
99.71	100.00	100.00	99.90
99.38	99.25	99.47	99.37
98.77	98.50	99.34	98.87
97.69	96.70	98.97	97.79
96.53	94.50	98.17	96.40
92.41	86.33	95.37	91.37
85.96	74.84	89.57	83.46
68.92	59.45	73.54	67.30
41.38	39.86	43.71	41.65
17.75	18.95	14.83	17.18
3.77	5.02	1.92	3.57
3.34	3.41	0.92	2.56

Figure L.8
Average Grain Size Distribution of Lahar
Deposits in Sacobia-Bamban / Abacan Rivers

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
 JAPAN INTERNATIONAL COOPERATION AGENCY

Grain Size Distribution



Source : Mount St. Helens (USGS)
 Pasig River in 1992 (PHIVOLCS)
 Sacobia-Bamban/Abacan River in 1994 (JICA)

Figure L.9 Grain Size Distribution at Mt. St. Helens and Mt. Pinatubo

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
 JAPAN INTERNATIONAL COOPERATION AGENCY

APPENDIX M

RESETTLEMENT/EVACUATION



APPENDIX A
RESETTLEMENT / EVACUATION
TABLE OF CONTENTS

		<i>Page</i>
M.1	RESETTLEMENT PROGRAM	M-1
1.1	Background	M-1
1.1.1	Displaced Families	M-1
1.1.2	Resettlement Program	M-1
1.2	Study Area	M-2
1.3	Affected and Threatened Populations	M-3
1.4	Affected and Threatened Municipalities	M-3
1.4.1	Aetas	M-3
1.4.2	Population and Household Profile	M-6
1.4.3	Population Growth	M-6
1.4.4	Population Mobility	M-6
1.4.5	Household Size	M-6
1.4.6	Age Composition	M-6
1.4.7	Income, Employment and Skills	M-7
1.4.8	Urban and Rural Barangays	M-7
1.4.9	Housing Profile	M-7
1.4.10	Community Services	M-8
1.5	Planning and Implementation Issues for Resettlement	M-8
1.5.1	Needs and Aspirations	M-8
1.5.2	Resource Limitation	M-8
1.5.3	Location	M-9
1.5.4	Political	M-9
1.5.5	Sustainability	M-9
1.5.6	Lack of Livelihood Opportunities	M-9
1.6	Program Considerations	M-9
1.7	Related Programs and Projects	M-10
1.8	Recommended Resettlement Program	M-11
1.8.1	Site Section	M-11
1.8.2	Resettlement Services	M-17
1.8.3	Livelihood	M-17
1.8.4	Community Organization	M-19
1.8.5	Implementation	M-20

	<i>Page</i>
M.2 EVACUATION	M-24
2.1 Affected and Threatened Households	M-24
2.2 Disaster-Preparedness and Relocation Plan	M-24
2.2.1 Disaster Preparedness	M-24
2.2.2 Evacuation	M-25
2.2.3 Process	M-25
2.2.4 Local Government Preparedness	M-26
2.3 Evacuation Routes	M-26
2.4 Pick-up Point	M-27
2.5 Development Plan of Evacuation Site	M-27
2.6 Evacuation Sites	M-28
2.6.1 Red Cross Villages and Tent Cities	M-28
2.6.2 Proposed Sites	M-28
2.7 Relife Operations	M-28
2.8 Organization	M-29
2.9 Operating Requirement	M-30
2.10 Operational Procedures	M-31
2.11 Phases of Operation	M-31
2.12 Coordinating Guideline	M-32
2.13 Funding	M-32

LIST OF TABLES

<i>Table No.</i>	<i>Title</i>	<i>Page</i>
M.1	Families Served in Permanent Evacuation Centers	M-33
M.2	Government Resettlement Program for Aetas	M-34
M.3	Number of Households Affected by Flood Flow in Sacobia-Bamban and Abacan River Basin	M-35
M.4	Number of Aeta Families in Tarlac and Pampanga	M-36
M.5	Characteristics of Aetas in Resettlement Sites in 1992	M-37
M.6	Population and Household in the Study Area	M-39
M.7	Number of Households by Residence in the Study Area (May 1990).....	M-40
M.8	Household Migration Profile.....	M-41
M.9	Number of Households by Size	M-42
M.10	Population by Age Group in the Study Area	M-43
M.11	Number of Households by Annual Income	M-44
M.12	Household Population by Employment Status in 1994	M-45
M.13	Unemployed Population by Type of Skills	M-46
M.14	Employment Persons at Least 15 Years Old by Major Occupation	M-47
M.15	Number of Households by Area Classification	M-48
M.16	Profile of Existing Resettlement Sites in Pampanga and Tarlac Study Area: September 30, 1994	M-49
M.17	Summary of Facilities in Existing Resettlement Sites in Pampanga and Tarlac Study Area as of September 30, 1994	M-51
M.18	Examples of Resettlement Services.....	M-53
M.19	Total Number of Evacuees and Capacity of Evacuation Sites.....	M-54
M.20	Evacuation Sites by Philippine National Red Cross.....	M-55
M.21	Proposed Permanent Evacuation Sites	M-56

LIST OF FIGURES

<i>Figure No.</i>	<i>Title</i>	<i>Page</i>
M.1	Resettlement Sites in the Study Area	M-57
M.2	Threatened, Affected and Unaffected Barangays by Municipality.....	M-58
M.3	Location Map of Resettlement Sites	M-67
M.4	Conceptual Resettlement Site Plan.....	M-68
M.5	Improved Traditional House	M-71
M.6	Magalang Settlement Project Plan	M-74
M.7	Proposed Road in Resettlement Site.....	M-75
M.8	Resettlement Process.....	M-77
M.9	Evacuation Route	M-80

M.1 RESETTLEMENT PROGRAM

1.1 BACKGROUND

1.1.1 Displaced Families

More than 26,000 families have been displaced as a result of the first two rainy seasons after the eruptions of Mt. Pinatubo in 1991 and 1992 (Lahars I and II) as given in Table M.1. Another 7,400, who are victims of Lahar III (1993 lahar and flooding), have sought temporary shelter in the evacuation areas, and are still to be permanently resettled. In 1994 (Lahar IV), 2,492 families from the Municipalities of Bacolor and Porac and living within the Pasig Potrero river basin were affected and subsequently relocated to the evacuation and resettlement sites of San Fernando and Angeles.

1.1.2 Resettlement Program

The government resettlement program as of 1994, covers the resettlement of 33,096 families including 8,732 proposed in 1994 program by the MPC, of which some 10,000 come from an upland ethnic minority group (the Aetas) as given in Table M.2. The dislocated lowland families, on the other hand, generally come from the river banks of the low-lying plains of Pampanga and Tarlac. For the past two to three years, they have been occupying the evacuation centers, it is not possible to send them back to their original settlements which are now covered with lahar. The government aims to relocate them as close as possible to their original settlement sites and within the same political jurisdiction if at all possible.

The numbers of dislocated and resettled families are enumerated below;

Families	Numbers of Families			Total
	1991 & 1992	1993	1994	
Displaced	26,787	7,400	2,492	36,679
Resettled	21,004	3,360	8,732	33,096
Cumulative Balance	5,733	9,823	3,583	3,583

Note: The above figures shows total numbers in Region III (Tarlac, Pampanga and Zambales).
Source: CABCOM for displaced families and MPC for resettled families.

The priority targets for past resettlement programs were the victims of Lahar I (1991) and II (1992). In 1991, the Mount Pinatubo Commission (MPC) administered 9 lowland and 10 upland sites. Six sites started by local governments were eventually assisted by the MPC. The rest are administered by other national and local government agencies, such as the Department of Agrarian Reform, the Provincial and City governments, and Non Government Organizations (NGOs) such as the Social Action Centers of Pampanga (SACOP) and Tarlac (SACOT), The Philippine National Red Cross (PNRC), the Philippine Bureau for Social Progress and Talet Kong Panulong Kapangpangan, Inc. and the Tribal Filipino Apostolate. In total, 21,004 units were prepared as of 1992.

Additional 3,360 units were started under the 1993 program. With the 1994 lahar flow, the resettlement sites intended for 1991 to 1993 lahar victims were made to accommodate new victims from Porac and Bacolor. The 1994 Resettlement Program as proposed by the MPC aimed to provide 8,732 additional housing units.

In 1994, there are 34 resettlement sites and 73 evacuation sites distributed in the following provinces as shown in Figure M.1:

Nos. of Resettlement Site and Evacuation Center		
	Resettlement Site	Evacuation Centers
Pampanga	15	37
Tarlac	6	20
Zambales	8	16
Nueva Ecija	3	-
Off-site	2	-
Total	34	73

Since majority of the dislocated families are tillers, some of whom are tilling their own land, they expressed dissatisfaction on the land given them. Because of the inadequacy of land for the entire affected population, most of the relocation sites merely provided homelots. Only the upland resettlements sites provided farm sites.

Productivity centers were proposed to attract domestic and foreign investors to invest within the resettlement sites and provide employment for settlers. Factory buildings and the required amenities have been introduced. The vital power and water supply needed, however, have not been installed. There are two successful productivity centers, both near Angeles City where garments, furniture and ceramics industries have been set up. The rest are temporarily used as evacuation sites.

In livelihood development, the Department of Agriculture (DA) started a program for farm rehabilitation, called O-Plan Sagip-Bukid. The program provides assistance in scraping off excess ashfall together with the plowing and harrowing of the residual ash and soil for cultivation using hired bulldozers and tractors. The cost of land rehabilitation work varied from P1,000 to P2,000/ha depending on the depth of the ash. The DA also provides the affected farmers free certified seeds, fertilizers and pesticides worth about P1,000/ha of farm land. The program aims to rehabilitate some 87,000 ha of farm land, which are relatively free from lahar risk. By the end of October 1991, a total of 55,000 ha in the four affected provinces of Bataan, Pampanga, Tarlac and Zambales were scraped and plowed. The rehabilitated areas have been planted to rice, vegetables and root crops.

Under a similar assistance program called Sagip-Hayop, the DA has set up livestock feeding centers outside the lahar-affected areas to provide shelter, food and veterinary services to animals. The DA is also monitoring soil and water chemistry changes caused by the volcanic ash, undertaking research to determine suitable crops for the affected areas and advising farmers on land preparation, cropping pattern and the use of farm inputs.

The Asian Development Bank's (ADB) assistance has been requested for the rehabilitation of about 9,000 ha in Pampanga that are relatively safe from future lahar flow; the improvement of post-harvest facilities in that province; and funding of farm-based livelihood program. Short gestation enterprises are needed to generate immediate and quick incomes for the victims of calamity.

There are eight (8) municipalities within the river basin of the Abacan and Sacobia-Bamban rivers which are either affected or threatened by lahar and flooding. 5% of their respective municipal budgets have been earmarked for relief and rehabilitation. The national government, on the other hand, allocates some P200,000 to P400,000 to the same cause, but these are not sufficient to implement effective disaster control programs.

1.2 STUDY AREA

For the planning of resettlement and evacuation, the planning area covered the areas within the administrative boundaries of the affected and threatened city and municipalities, i.e., Angeles City, Magalang, Mabalacat, Mexico, Sta. Ana, Arayat, Bamban, Concepcion and Capas, all within the Sacobia, Bamban and Abacan River Basins as shown in Figure M.2.

The evacuation and resettlement plans are premised on the following principles:

- 1) Protection of lives and properties
- 2) Restoration to normalcy
- 3) Self-sufficiency or independence from external assistance
- 4) Improved well-being

In studying the situation of the Aetas who formerly resided within the provinces of Zambales, Pampanga and Tarlac, and have now been resettled, published anthropological studies and secondary reports on Aeta resettlement sites were consulted.

Inasmuch as resettlement programs require livelihood for their success, the entire Region III, specifically the provinces of Tarlac and Pampanga, comprised the study area for identifying appropriate livelihood programs.

1.3 AFFECTED AND THREATENED POPULATIONS

This study covered victims of Lahars I, II and III who have since returned to their original areas, as well as those who reside in areas threatened by future lahar and flood flows. The basis for determining the threatened areas are those indicated in the 1994 study of the PHIVOLCS. The survey indicates that other municipalities not identified in the PHIVOLCS study have already been affected. The numbers of households affected by flood flows in Sacobia-Bamban and Abacan river basins are given Table M.3.

Lahar IV did not affect the planning area for resettlement, although the affected families from Bacolor and Porac have been accommodated in the resettlement and evacuation sites within the study area.

Those who have been affected by Lahars I, II and III have been provided resettlement sites in the resettlement program of the government and were therefore, initially excluded from the interview survey under the Study. However, in the event of future lahar and flood flows, it will be very difficult for humanitarian reasons to exclude those who have been programmed for resettlement and have not yet resettled. PHIVOLCS's study showed that the event of lahar flow into the study area has lessened. But for planning purposes, the worst case scenario has been adopted.

Among the affected and threatened population, some households are scheduled to be resettled in completed sites: these area, 234 sites in Pampanga and 146 sites in Tarlac (380 sites in total). On the other hand, the number of households who had plans of relocating are 781 in Pampanga and 1,397 in Tarlac (2,178 in total).

The targets of evacuation and resettlement are as follows:

- 1) Those who are settled in the path of lahar flow and cannot be reasonably protected by engineering works, and
- 2) Those who are settled within the right-of-way of flood/lahar control structures and sand pocket areas.

1.4 AFFECTED AND THREATENED MUNICIPALITIES

1.4.1 Aetas

The survey conducted by the Philippine Business for Social Progress (PBSP), showed the capacities and vulnerabilities of the Aetas affected by the initial eruptions as follows:

(1) Habitat

The Aetas, although of one origin, is comprised of two different groups; the Nomadic and the Acculturated Aetas. The nomadic Aeta population lives within the mountainous and forested areas of Mt. Pinatubo in Zambales, Tarlac and Pampanga and stays in one place only for as long as they are able to farm, hunt and gather.

Many Aetas have settled in the lowland areas at Barangay Macapagal and Marcos, located near the perimeter of the former Clark Air Base, where they are sustained by their scavenging activities. They have also been engaged by then US and now Philippine military authorities for the jungle survival training of military personnel and for eco-tourism activities.

The Aeta group who have been previously resettled by the government in Macapagal and Marcos Villages were affected by lahar and are now relocated to the resettlement and evacuation sites. As reported by the Office of Northern Cultural Communities, there are 5,575 Aeta families and 1,521 of these are resettlement and evacuation sites within Pampanga and Tarlac.

The rest of the population in the off-site settlements, numbering 1,550 are in Pampanga: 91 are in Angeles City; the municipality of Floridablanca, 339; Mabalacat, 251; and Porac, 578. In the province of Tarlac, there are 2,504. They are found in the municipalities of Bamban, 303, San Clemente, 271, Capas, 980, San Jose, 852 and Tarlac, 98 as given in Table M.4.

(2) Social grouping

Aeta's households are generally small, averaging three to four members. Each community is composed of three to four ancestral families and their descendants. The authority is vested on the elders who are respected leaders of each family.

The Aetas live a communal life, and the spirit of cooperation is very evident in both social and economic activities. There are leaders in particular activities but no one has absolute power and authority over all aspects of their social life.

The population number is fluid. In the dry season, the Aetas usually spend days visiting friends and relatives in other villages or they themselves are being visited by relatives or friends. Marriages and family conflicts also affect the family grouping. Inter tribal marriages are encouraged but not marriages between first degree cousins. There exists some hostility between groups which is usually characterized by distrust and/or avoidance. Thus, in resettlement areas, the different tribes would rather be segregated from each other, but most specially from the lowlanders. The mainstay of their religion is their belief in anitos, and though, they have been introduced to Christian ways. They continue to practice their own culture while assimilating some Christian practices.

(3) Education

Few are willing to send their children to school. Those who do so understand that if their children are literate, they can help in their transactions with the lowlanders. Most of them drop out within the year, finding it either difficult to keep up with the lessons or simply suffer being cooped up in a classroom, especially the hunting season which is between September to November.

The educational profile of Aetas in San Josefa, Kalangitan, Bagong Buhay and Dueg shows that 14.8% have no formal schooling and 41.4% have completed some elementary and 16.1% for high school as given in Table M.5.

Traditional values hold the separation of the sexes, outside of the family grouping. However, schools provide a socialization opportunity for members of different tribes, which would normally have avoided each other.

(4) Sustenance

The Aetas basically derive their sustenance from shifting cultivation which they supplement by hunting and gathering. The Aetas use bows and arrows for hunting. Bladed instruments are used for clearing and are valued for gifts as part of the bride price and as offerings to the spirits and during rituals. For fishing, they use goggles and iron spears. Households utensils consist of bamboo, coconut shells and baskets.

The Aetas practice shifting cultivation, multi-and intercropping in secondary forests which they have cleared. The crops planted are basically root crops, such as sweet potatoes, yams, taros, beans, corn and recently rice. They gather birds, bats, frogs and insects (beetles), wild bananas and mushrooms for food. Sweet potatoes, cassava, banana (saba), wild fruits, venison and wild boars are part of the produce which they sell to lowlanders. Smelting of weapons, especially the native bolos, and making bows and arrows provide the Aetas with additional income. A number of women are engaged in making baskets and beads. The uncultured Aeta use beaten barks as their clothes but many who have had frequent contact with the lowlanders have shifted to modern wear.

Within the family grouping, there is mutual cooperation. All farming activities are shared among the members of the household, both males and females. The women are responsible for harvesting the produce. During the hunting season, the women plow the fields and tend the crops. Beyond the family grouping, there is labor exchange. One who seeks help from the other tribes are expected to return the service when needed. Thus, assistance extended to them by governments and non government organizations are viewed as philanthropic acts or sharing.

(5) Health

For their medical needs, they mix herbal with modern medicine availed from health centers. They also utilize mediums to contact their anitos to diagnose their serious ailments.

(6) Dwellings

Their traditional dwelling are simple in construction and are temporary, as they do not stay in one place for more than a year. The materials are made of tree branches, bamboos, leaves and trunks of wild bananas and cogon. The types are lean-to, stilts and tents.

(7) Acculturation

The frequent contacts with the lowlanders have influenced and change their traditional way of life. Some practices are assimilated into their culture, e.g., wearing of modern clothes, canned sardines and rice in their diets, use of health facilities for their health needs, sedentary plowing for their livelihood. They have learned to use guns in hunting and to trade with the lowlanders. However, they have retained much of their traditional beliefs and practices and modified whatever they have borrowed from the outside to suit their own ways of doing, believing and thinking.

Their knowledge of the habits and habitat of the various flora and fauna in the forested areas should be tapped.

(8) Identified Community Needs

In an intensive survey of various resettlement sites : Dueg, Kalangitan, Ayala, Planas and Nabuklod undertaken by the JV Foundation, the Aetas expressed that they are worse off in the resettlement areas for lack of food, work, farmland and income. However, many enjoyed the daily food rations.

As to their needs, they have identified and would welcome assistance in job and business opportunities primarily in farming and livestock raising. There are a few who prefer crafts and construction works.

Health services, such as supplies and doctor, were identified as the second. Other welcomed assistance are food ration, water and electricity.

1.4.2 Population and Household Profile

In August 1994, the estimated population of the project area is 678,910 or 132,898 households, showing a decline of -1.74% per year between 1990 and 1994, compared to a 2.70% annual growth rate in the previous decade as given in Table M.6.

1.4.3 Population Growth

In the affected and threatened areas, the total population has been estimated at 123,880 (23,820 households) and 179,097 (33,758 households), respectively, for a total of 302,977 (57,578 households). Population decreased by 0.62% annually, between 1990 and 1994 for the affected population, and 4.44% for the threatened population. Because of the eruption of Mt. Pinatubo, the unaffected barangays showed a 0.93% increase, which was far below their 2.94% increase of the previous decade.

1.4.4 Population Mobility

In the entire project area, 6,365 households are in resettlement and evacuation and staging areas, while 4,913 emigrated outside the project area.

Between 1990 and 1994, 322 (0.6%) new households were formed and 6,722 moved into the barangay. 2,767 (4.9%) came from another place within the same barangay, while 2,198 (3.9%) came from a different barangay, but within the same municipality. The rest came from another municipality of the same province (900), another province (281) and a foreign country (33) as given in Tables M.7 and M.8.

1.4.5 Household Size

The average household size is 5.11. Pampanga has an average of 5.09, while Tarlac has 5.20. On the other hand, the affected population has an average size of 5.20, while the threatened population has a slightly higher average family size of 5.32 as given in Table M.9.

Households with one to two members number 4,570 (7.94%), while those with three to four members are 18,274, (31.74%), five to six members, 20,228 (35.13%) and seven to eight, 9,671, (16.80%), and more than eight members, 4,835 (6.8%).

1.4.6 Age Composition

The population by age group shows a very young population, with 109,781 (36.2%) under 15, and 184,836 (60.9%) between 15 to 64. Of the school going age, an estimated 60,264, (48.8%) are in the 5 to 12 elementary age group, 29,675 (24.0%) in the 13 to 16 or secondary level age group and 33,623 (27.2%) in the 17 to 21 or tertiary level age group as given in Table M.10.

1.4.7 Income, Employment and Skills

1,552 (2.7%) of households earned an annual income of less than P5,000, while the median income ranged from P30,000 to 40,000 as given in Table M.11.

43,007 (22.2%) of the labor force are unemployed. Their skills included baking and cooking 3,704, farming, 1,134, dress making, 1,481 and driving, 1,017 as given in Tables M.12 and M.13.

Of the employed, 12,581 are farmers and fishermen, 10,047 are sales workers, and 8,063 are motor vehicle drivers. 71,035 (73.1%) are employed within the same locality where they reside, while 6,056 (6.2%) are employed in a foreign country as given in Table M.14.

1.4.8 Urban and Rural Barangays

14,146 (24.6%) reside in urban barangays, 2,593 (4.5%) in upland rural barangays, and 39,547 (68.7%) in lowland rural barangays as given in Table M.15.

1.4.9 Housing Profile

Within the threatened barangays, 30,215 (89.5%) houses are single-detached, 2,049 (6.1%) are shanties and 888 (2.6%) are duplex units. 253 apartment dwellings are found in Angeles (138), Capas (79) and Concepcion (73). Only 5,726 (16.9%) have roofs made of temporary materials, i.e., cogon, nipa or makeshift materials. Majority (21,944 or 65%) are made of galvanized iron sheets or aluminum roofing. 6,050 (20.20%) have exterior walls made of temporary materials, such as bamboo, sawali, cogon, nipa and makeshift materials. The rest used permanent materials such as lumber and concrete hollow blocks. The predominant types of materials used for flooring are plain cement (58.4%) and bamboo (18.8%). 46.8% do not have ceiling materials at all. The rest used plywood, 27.3% and bamboo (sawali), 12.1%.

The most common types of houses are one bedroom houses (40.8%) and two-bedroom houses (31%). Only 8.9% have no separate bedroom at all, while 11.6% have more than two. Other rooms which are typical of a house include a living room, dining room, kitchen. 7,780 (23%) do not have private toilets and only 1,744 (5.2%) have garages. Below is the result of the survey:

	Yes (%)	No (%)
Separate living room	67.5	31.7
Separate dining room	55.6	43.9
Separate kitchen	64.3	34.9

The area of the house and lots are as follows:

Area (m ²)	House (%)	Lot (%)
Less than 20	26.5	31.2
20 to 49	36.5	34.0
50 to 89	18.1	20.2
90 to 119	12.8	13.0
More than 120	4.7	1.6
Total	100.0	100.0

24,404 (81.0%) own the house and lot they occupy, while 5,724 (17%) own the house only, and 1,914 (5.7%) rent or lease the house and land.

Majority (33.1%) estimated the selling price of their housing unit to be between P50,000 to P150,000 and (29.6%) between P10,000 to P50,000. 91.1% used electricity for light

and 3.2% for cooking. The rest used liquefied petroleum gas (45.9%), and wood or charcoal for cooking (25.9%). 61.7% have their own water-sealed toilet. 38.5% have their own deep well and 27.9% are served by piped water systems. The rest depend on communal well and springs.

1.4.10 Community Services

41.7% seldom visit the health center, while 26.8% visit the health center at least once a week and 23.8% at least once a month. Those who do, avail of the health center within the same barangay. While, 68.2% visit public markets or talipapa (flea markets) at least once a week and 14.2% once a month. 34.7% frequent them within their barangays, while 45.3% have to go outside of their barangays for their recreational pursuits.

75.7% go to places of worship once a week and 43.3% do not need to go outside of their respective barangays, while 36.5% do.

37.1% never frequent recreational centers, while 22.5% do once a month. 35.7% go within the same barangay, while 24.4% go to another barangay.

1.5 PLANNING AND IMPLEMENTATION ISSUES FOR RESETTLEMENT

1.5.1 Needs and Aspirations

The major issues are the conflicts arising as a result of differences between the settlers, perceived needs and aspirations and the government solutions and policies on evacuation and resettlement. Resettlements are urban in design and character, while the people to be resettled are mostly agricultural. The indigenous communities are hunters, gatherers, marginal livestock raisers and shifting cultivators. The urban-type community services and facilities were not perceived to address an immediate need rather than livelihood and shelter.

The absence of livelihood in resettlement sites caused many families (estimated at 21,700) to return to their original barangays which are still prone to future lahar and flood flows and to move elsewhere without government or NGO assistance. During the time of the survey they have already returned to their original barangays. The affected families who resettled but returned to their original barangays are equivalent to about 12% total affected families; namely, 1,017 families(11.8%) in Pampanga and 1,014 families in Tarlac.

The eruption affected the Aeta populations, both the nomadic upland and the lowland acculturated tribes living off the boundary of the former Clark Air Base. Relief and rehabilitation did little to improve their well-being. At least 25 reportedly died during their stay at the Planas Evacuation site due to dehydration and broncho pneumonia. Morbidity rates ranged from 86 to 3,921 per 1000 population. Many have to adjust to life in the resettlement areas and to new types of livelihood for which they were not prepared.

1.5.2 Resource Limitation

The sheer number of families who have to be evacuated and resettled continue to strain the resources of the government and non-government organizations.

As of 1994, 7,200 families displaced by Lahar I and II and over 14,000 displaced by Lahar III remain in evacuation centers and staging areas. Lahar IV has displaced an additional 2,492 families from Porac and Bacolor. These families were resettled CABCOM way ahead of those who have been staying in the evacuation centers.

Many resettlement areas still have incomplete houses, infrastructures and utilities. A number of houses and productivity centers are not yet occupied for each of electricity.

1.5.3 Location

Due to the urgency, some sites used for evacuation and resettlement, were threatened by lahar and flood flows, i.e., Nabuklod, Villa Maria and Camias. O'Donnell and San Vicente can become inaccessible or isolated from the rest of the province during the rainy season.

1.5.4 Political

The population of the resettlement areas exceeded those in the barangay; thus, threatening the local leadership as well as the social and political structures of the host communities. The transfers from the political jurisdiction to another did not change the "residence" of the settlers. Many associated themselves to the original place of residence. Resettlement areas were formed into blocks according to the place of origin and retained their identities as in their original barangays.

1.5.5 Sustainability

Private sector-initiated resettlement areas were not recognized by the Mount Pinatubo Commission. Instead of supporting these efforts, these communities were left to fend for themselves. Resettlements within privately-owned lands were similarly left on their own. Infrastructures and utilities have not been installed in these areas pending the transfer of ownership to the settlers. Local governments especially were worried about the continued assistance needed by the resettled families.

1.5.6 Lack of Livelihood Opportunities

In spite of the many livelihood financing programs available, there were few takers. Business planning and employment preparation were lacking. Those who needed capital could not avail of them due to the loan requirements. They have to work for the daily sustenance.

Unemployment rate is still very high among the affected and resettled families. First, the closure of the US Military Bases resulted in 42,617 lost jobs. Secondly, the loss of agricultural lands due to lahar, caused many more farmers to lose their traditional source of livelihood. Finally, daily food rations resulted to dependence on external material assistance and less initiative to work.

1.6 PROGRAM CONSIDERATIONS

- 1) Choice of site. The site selected should provide similar opportunities for the livelihood of the settlers. It should be safe from future lahar and flood flows and be accessible even during the rainy season. The site should preferably be in or adjacent to the original habitat.
- 2) Community and local government participation in planning and implementation of resettlement sites. Both should move toward self-management.
- 3) Integration of the population into the socio-economic system the barangay and its neighboring barangays instead of designing self-reliant community designs which promote enclaves within the municipality,
- 4) Unified program control for better coordination; and
- 5) Effective site management to ensure smooth transition during turn over of administration.

- 6) Balance in the provision of housing, livelihood and community services and facilities.
- 7) Provision of options and flexibility for livelihood and housing appropriate to the skills level and income of the individuals.
- 8) Integration of self-initiated and privately-initiated evacuation and resettlement areas into the overall government assistance program.

1.7 RELATED PROGRAMS AND PROJECTS

The resettlement program might be developed within the greater development context of the region, the province, the municipality and special regions where they are situated. National policies should be considered as well.

Among these are: the Urban Development and Housing Act, RA 7279, which provides for the development of socialized housing as a component of private land development projects. This makes private sector involvement in socialized housing mandatory and prerequisite to land development applications. This law is appropriate to cities and urbanizing municipalities with large scale residential subdivisions going on, such as Angeles City, Mabalacat and Mexico.

A second program is the establishment of regional agro-processing centers and industrial estates, including export processing zones and special economic zones. The proposed development of Clark and Subic into special economic zones will provide employment opportunities to displaced persons. The resettlement sites and these livelihood centers can be co-located, as in the Export Processing Zone (EPZA) of Angeles City and Angeles Livelihood Center under the administration of Livelihood Corporation.

Priority sites of various sectoral programs being implemented by various government agencies and non-government agencies can be introduced into the site, or vice versa. The resettlement projects can be located near these planned developments which are sure to attract investments and jobs.

The Agrarian Reform Law provides resettlement areas to agrarian reform beneficiaries. One agrarian reform site, Maligaya Settlement, Barangay Bamban has become the commercial area and resettlement of evacuees from Bamban and Concepcion. The proposed development of the Magalang and Sta. Ana settlement areas and six other agrarian reform communities may be able to accommodate the victims. Two off-sites have also been developed within the DAR resettlement program: Mindoro and Talakag, Bukidnon.

The land development program of Sacobia Development Authority (SDA) is the original site of the resettlement of 20 Aeta families who were relocated to the resettlement in Dueg, San Clemente, Tarlac, and has since returned to San Vicente. At the same time, the rest of the area under the jurisdiction of SDA is planned to be planted to various crops and fruit trees. The SDA has proposed resettlement for 2,000 which can be employed as farm workers.

The Social Forestry Program of the Department of Environment and Natural Resources (DENR) is also a potential program framework for the upland areas and can employ the upland Aetas. Similarly, the Sloping Agricultural Land Technology, an upland cultivation technology have been adopted by most NGOs operating in the upland areas.

Finally, the development of Mount Arayat as a national park and Capas and Mt. Pinatubo as a tourist destinations are projects that are expected to enhance the livelihood opportunities of the areas. Recently, the Department of Tourism (DOT) has proposed on Aeta Village within Clark Air Base.

1.8 RECOMMENDED RESETTLEMENT PROGRAM

1.8.1 Site Section

(1) Types of Resettlement Sites or Resettlement Prototypes

The MPC has drawn up two types of resettlement approaches:

- a) Upland settlements for the Aetas who have expressed preferences to return to a mountainous environment where they can farm, hunt, gather forest products and raise livestock; and
- b) Lowland settlements for the lowland communities who have signified willingness to be relocated to similar vast plains where they can apply their farming and other acquired income-generating skills.

The Department of Social Welfare and Development (DSWD) and the Philippine National Red Cross (PNRC) have adopted similar types of resettlement projects. Tables M.16 and M.17 shows the profile of resettlement sites.

As previously discussed livelihood and shelter are the immediate needs of affected families. In this light, a shelter cum livelihood approach should be adopted. The varied skills (tillers, livestock raisers, hunters, craftsmen construction workers) of the affected families should become the focus of the resettlement prototype.

In order to ensure the provision of livelihood to the settlers, the following resettlement prototypes are proposed:

- a) Residential communities to be located near the poblaciones and urban areas
- b) Agrarian reform communities which are comprised of orchard villages, livestock villages and rice farms.
- c) Agro-forestry villages
- d) Industrial estates
- e) Craft production villages

Residential resettlements are located near the major poblaciones where jobs opportunities are available within commuting distance. All municipalities, except for Magalang, have to provide residential settlements, within the planned expansion of their urban areas.

Agrarian reform resettlements are proposed within flat, arable and irrigable areas for farmer-beneficiaries. They are also the priority areas for major irrigation systems. Lots are provided for the production of non-traditional, high value crops, livestock raising and fruit orchards.

Agro-forestry villages are planned in national parks or forest reserves where the community members can participate in reforestation and forest security management programs and activities.

Certain sites in mountainous areas proposed for contract reforestation are : O'Donnell, Kalangitan, Dapdap, Bamban, Dueg, Mainang and Balaybay.

Industrial estates in the area include Clark Development Corporation (CDC), Angeles Livelihood Center and the Hacienda Luisita, in San Miguel. The Clark Field Special Economic and Free Port Zone is expected to generate employment for 1,250 in its industrial, commercial and aviation projects within five years, and an additional 4,000 workers in the tourism estate project within 2.5 years. The industrial estate management should be requested by Mt. Pinatubo Commission to accommodate Mt. Pinatubo victims

and to provide workers' housing within the estate itself or its the immediate vicinity. At least 94.5 ha of residential housing units are required for this work force.

Angeles Livelihood Village at Pulung Cacutud, operated by the Livelihood Corporation is expected to generate 500 jobs. Residential areas needed by these workers total 9 has. Hacienda Luisita will generate 5,000 jobs and. The require housing area of 100 has.

Craft production villages are provided with common service facilities by the Cottage Industry Technology Center of the Department of Trade and Industry (DTI) to assist and build the business/livelihood capacities of entrepreneurs or sub-contractors in the dominant industries in each of the municipalities . The craft villages are planned to produce products in commercial quantities and quality in order to be viable. The craft production villages can also cater to domestic and foreign tourists by featuring regular demonstrations of the crafts as well as products for sale. The service facility can be the focal point of the community of households interested in pursuing this line of work.

A craft production village can generate at least 100 jobs for every site 2.0 ha. of residential areas and community service center. This is best suited for affected families who want to shift from agricultural to non-agricultural occupations.

On a long term basis, permanency of any type of settlement should be highly considered. Local government units should incorporate the resettlement plan into their local development plan. The local development context, therefore, should be integral in relation to the long range settlement plan in order to become strategic.

(2) Location

The proposed resettlement sites should meet the following location criteria:

- a) not within the projected path of lahar flows or where risk of being affected in the future is very low
- b) where prospect is high for establishing livelihood opportunities
- c) accessible to basic services (health, education, market)
- d) possibility for expansion for second generation family members, unassisted settlers, friends and relatives of original settlers.

In the final site selection, two more criteria should be added:

- a) government owned land if possible, otherwise privately owned lands, which are reasonably priced
- b) no legal impediment for development

The government-administered resettlements are located on government-owned lands or donated to the government by private individuals. Only the recent resettlement in Mainang was purchased. All sites are at an average distance of 5 kilometers from the national highway.

At least five existing resettlement sites can still accommodate more settlers, and these are:

Site	Capacity (No. of Households)
Mauaque	779
Pandacaqui	547
O'Donnell	9,939
Mainang	1,913
Total	13,178

Figure M.3 shows the location of resettlement sites

Except for Pandacaqui, a residential area which caters to settlers from Angeles City, residential area, all four sites are proposed to provide agricultural farmlots to the settlers.

New sites which have been identified by the different government agencies are as follows:

- a) Sacobia Development Authority : Calumpang, San Vicente and Sto. Niño
- b) Department of Agrarian Reform

Site	Area	No. of Households
Magalang Settlement (Ayala and Maria Sinukuan)	536	213
Suclayin, Arayat	403	400
San Mateo, Arayat	130	130
San Nicolas, Arayat	130	130
San Pablo, Sta. Ana	386	386
San Pablo Central, Sta. Ana	200	200
Laput, Mexico	140	140
San Agustin, Magalang	121	121
San Hdefonso, Magalang	120	120
Total	2,166	1,840

These other sites originally identified by DAR are in flood prone locations.

- c) Department of Environment and Natural Resources with the Department of Tourism
Mt. Arayat National Park, Capas Watershed Reserve, Along Capas Death March Road
- d) Clark Development Corporation: Angeles City and Mabalacat
- e) Livelihood Development Corporation: Pulung Cacutud, Angeles City
- f) Department of Trade and Industry

The Cottage Industry Technology Center/Department of Trade and Industry should initiate craft production settlements for each of the following municipalities:

Arayat	Garments
Mabalacat	Furnitures
Mexico	Gifts, toys and housewares
Capas	Metalcraft
Bamban	Ceramics
Mabalacat	Candies and confectioneries
Magalang	Fruit and vegetable processing
Concepcion	Meat processing
Sta. Ana	Handmade paper

- g) NGO Resettlement Sites

The NGO initiated resettlement areas are as follows: Philippine Business for Social Progress Buensuceso (which has been earmarked for 200 more families from Barangay Amsic, Angeles City) NORFIL, Dueg, San Clemente, Tarlac

h) Private Resettlement Developments

Urban-type resettlement sites are recommended nearest poblaciones of each municipality to accommodate an estimated 1,200 households (See Figure M.3).

(3) Design and Layout of Resettlement Sites

The Technology and Livelihood Resource Center designed resettlement areas as self-reliant residential areas, providing for the basic needs of its inhabitants as well as urban service centers for the adjoining towns. In contrast to the small rural barangays, the settlement site presented a modern alternative to the unplanned, crowded urban settlements of Central Luzon provinces. Figure M.4 shows some prototype designs.

They are intended to be sub-regional growth centers that can reinvigorate the rural areas of Zambales, Tarlac and Pampanga. In contrast, the PBSP resettlement in Pandacaqui and the provincial resettlement in Suizo, Tarlac are intended to be part and parcel of the barangay in which they are to be located. Minimum services are required in the latter, while the former, also provided for the needs of the receiving barangay.

(4) Land Allocation

The minimum site size is 50 has and the largest site is O'Donnell, Capas, with 300 has.

Since the sites are designed as sub-regional centers, the average percentage to total land area allocated to the different uses are as follows:

Uses	Percentage to total area (%)
Residential	42.54
Institutional	7.11
Industrial	7.01
Commercial	3.00
Mixed use	1.14
Plaza, Parks and Open spaces	9.00
Circulation	28.56

On the other hand, the private sector developed smaller parcels of lands for resettlement. The Philippine Business for Social Progress acquired a 7.8 has site in Barangay Buensuceso, Arayat, predominantly for residential purposes for 400 families from Barangay Amsic, Angeles City.

a) Residential Areas

The residential component is arranged in blocks and formed into a cluster which becomes a superblock. Standard lot sizes vary from 150 m² to 300 m². However, most sites had to accommodate double their capacity. The 150 m² residential lots were later divided into two, each with a 25 m² house. The DSWD core houses, on the other hand, are only 6 sq.m. (See Figure M.5).

The housing sites proposed by the PBSP have floor areas of 25 m², with private toilet facilities. Temporary shelters are provided during the construction phase particularly for the beneficiaries who render voluntary labor and prefer to stay on site.

Housing in the upland sites are mostly made of indigenous materials: sawali (bamboo) walls and cogon roofs, while those in the lowland areas are made of sawali (bamboo) walls and galvanized iron sheet roofing. In the areas assisted by the USAID, roofing materials are made of tarpaulins.

b) Institutional

Community centers and church sites are clustered around the plaza. The community centers include elementary and secondary schools, hospitals, sports and multi-purpose gymnasias, fire and police station, government buildings and at least three church sites. (See Figure M.4 for the site development plan of the community centers.)

Health centers and 6-room school buildings are provided.

In resettlements near the built-up areas such as Suizo, the above stated social infrastructures are not considered necessary. In Buensuceso, the social services were made available to the barangay resettlements.

c) Industrial

The productivity centers are located in one section of the community, near the main entrance. Each building has a floor area of 1,250 m². The productivity centers are intended to attract investors to set up industries and provide jobs in the resettlement area.

The standard factory building houses a livelihood training center. Since majority of the beneficiaries to be integrated into the urban settlements farmers, training programs were planned to provide these settlers with the skills needed in an industrial work force.

The productivity centers have not been fully maximized up to this time for lack of electric and water supply. Right now these are being used as temporary evacuation sites.

d) Commercial

A public market and commercial areas are located near the major entrance of the productivity center to serve the day to day needs of the residents. In most resettlement sites, the public markets remain unoccupied for lack of capital.

e) Open space

Green space in the form of plaza, parks, conservation easement and forest reserves are located in the center to provide the locus of major socio-cultural and political events.

Pocket parks are distributed in strategic places to serve as breaks to residential blocks. These pocket parks also function as outdoor social spaces for the neighborhood.

Along creeks, rivers and roads, a planting strip serve as buffer and as soil protection.

f) Forest

Mountain areas within the resettlement areas are recommended for contract reforestation. Three to seven hectares are usually allocated per family by the Department of Environment and Natural Resources.

g) Agricultural Farms

A few of the resettlement sites provided farmlots, ranging from 5,000 m² to one hectare per family.

Within the DAR Magalang Settlement, the lands are allocated as follows:

Rice Village	2 has farmlot 2,000 m ² homelot
Livestock	0.5 ha.
Orchard	2 has. farmlot 800 m ² home lots

The DAR provided for orchards, livestock raising and rice production with some common services, such as:

1. Cooperative store
2. Warehouse
3. Price mills (mini-cono type)
4. Seedlings
5. Thresher and other farm implements
6. Piggery and poultry pens
7. Training center

Figure M.6 shows the development plan of Magalang Settlement.

h) Circulation

In anticipation of future growth and development, roads are wide and paved: primary roads are 20 m. wide, while collector roads, 15 m. and residential local roads are 10 m. Roads are laid out in grids. See Figure M.7 for the cross section of the different road types.

The sites are linked to existing towns, with two-lane access roads. On the other hand, Most of the lowland settlements have cemented road access. The access road to upland resettlement need cementing and widening to accommodate the increase in traffic volume.

i) Utilities

The site are designed to be provided with piped water system and electricity. Open drainage along the roadway is in place to collect rain water that can cause flooding in the site.

For lack of power supply, the piped water system is not yet operational in most sites. Households in the upland sites still depend on springs and purchase cans from water vendors.

Potable water should already be available before the start of relocation. Water supply should be installed for construction

j) Expansion

The layout should be simple and spacious enough to accommodate future adjustments and expansion. The same should be true for the homelots.

k) **Integration into the municipality and barangay.**

The design should be integrated into the municipal land use plan, in terms of access as well as the complementation of municipal services and facilities.

Transportation should link the area to the nearest poblacion so that the settlers can be accessible to schools, hospitals and other services which are not provided within the resettlement.

Resettlement sites should not be isolated from rest of municipality especially during the rainy season, nor should its services be exclusive to the resettlement occupants.

Level of services should be comparable to the services available in the areas where settlers originated.

1.8.2 Resettlement Services

Despite the distinct cultural orientations, the programs should provide for wide-ranging services and access to benefits and opportunities that feature their pre-eruption living conditions. These identified services are given in Table M.18.

1.8.3 Livelihood

An important component of the resettlement program is the livelihood program which is expected to generate 79,862 jobs to complete the 1993 target of 162,390 beneficiaries. Part of the livelihood program is the targeted external investments in the 36 productivity centers which are expected to provide 6,480 jobs. The rest of the livelihood projects consists of employment facilitation, micro-cottage-small and medium enterprise development (Micro-CSME), marketing and investments promotion, technology transfer and commercialization for resource - based industries.

1) Livelihood Program Objectives

The livelihood development policy framework consisted of the program framework of three (3) concerned agencies:

a) **Department of Science and Technology (DOST)**

To promote appropriate and commerciable technologies to both agricultural and industry sectors

b) **Department of Trade and Industry**

To provide enterprise-level advisory and assistance services such as institutional development, entrepreneurial development, micro-enterprise marketing, and for LAVA projects, technical assistance and common service facilities

To support and strengthen existing industries and to rehabilitate the agricultural productivity

c) **Technology and Livelihood Resource Center (TLRC)**

To assist in the recovery of economic and livelihood activities through liberal financial assistance programs

To promote rural industrialization

To generate employment opportunities

2) Types of Programs

a) Financing, which are not collateral-based

- Micro-Lending (on-going)
- Small and medium industries lending (proposed)
- Investor financing program (ongoing at TLRC)
- Construction of productivity centers

b) Marketing

- Marketing promotions (ongoing)
- Trade fairs, bazaars, flea markets, product displays, and trademark marketing
- Marketing consolidation
- Direct marketing (proposed) (marketing vans)

c) Technology

- Technology cadres (proposed)
- Seminars, study missions, demonstration farms, consultancy and coaching, technology manuals
- Mobile training centers (proposed)
- Common service facilities, including kilns

d) Entrepreneurship development

- Small business consultancy service (proposed)
- CEFPE Program (Creation of entrepreneurs, formation of enterprises, a training module on planning, organizing and controlling, including resourcefulness, creativity and risk-taking)
- Role modeling
- Identification, documentation and promotion of successful Pinatubo entrepreneurs

e) Institutional development

- NGO institute which will conduct trainings, subsidies and support mechanisms
- Cooperative account management
- Subsidies and seed fund

f) Credit Programs

- LEAF - FAP for PC locators
- Livelihood Assistance for Victims Affected (LAVA)
- Food-for-Work and Cash-for-Work

3) Status of livelihood programs for Pinatubo victims

As of August 26, 1994 five major livelihood programs are being implemented by 20 agencies to step up the delivery of livelihood projects to the victims. The programs, employment generation, Micro/Small Enterprise Development, Marketing/Investment

Promotion, Training/Skills Development and Resource-based, have a total disbursement of P17,039,000 benefiting some 99,799 lahar victims with 15,609 projects.

For 1994, of the total P1,149,732,000 programs funds available, 75 percent is earmarked for a target number of about 80,817 settler-beneficiaries.

a) Productivity center program

To accelerate the rehabilitation and development of the Mt. Pinatubo affected areas and resettlements, 36 factory buildings in seven productivity centers were constructed to attract investors into the areas and provide employment opportunities to victims. These programs have been administered by the Technological Livelihood and Resource Center (TLRC), since inception.

As of August 1994, ten companies have confirmed their leases of 17 factory buildings. However, only three buildings at Mexico new resettlement area are occupied, employing 76 settlers, while three other investors are scheduled to occupy factory buildings in Pandacaqui and Concepcion by the end of September.

Other companies have yet to start operations because of the absence of utilities such as water and electricity.

b) Performance of loan programs

There are two loans programs under which repayments for end beneficiaries have started. These are the Livelihood Assistance to Victims Affected by Mt. Pinatubo (LAVA) and the Special Credit Assistance Program to Placed Overseas Contract Workers (SCAP-OCW). Total amount disbursed under LAVA is P112,827 million, while the SCAP-OCW is P12,561 million with 19,258 beneficiaries and 1,004 grantees, respectively.

Repayment under these programs are 66% and 74%, respectively.

1.8.4 Community Organization

(1) Objectives

To integrate as a new barangay and participate in the affairs of the municipality and the province

(2) Process

- a) Organize settlers into Homeowners' Association and register with the Home Insurance Guaranty (HIGC) or Securities and Exchange Commission (SEC) or Cooperative Development Authority (CDA)
- b) Undergo training on
 - Resettlement program
 - Community organization
 - Community development management
 - Multi-sectoral planning workshop
 - Leadership training
- c) Estate Management
 - Financial management
 - Manage the community

(3) Responsibility center

- | | | | |
|----|-------------------|---|-----------------------|
| 1) | Initial phase | : | Implementing agency |
| 2) | Maintenance phase | : | Local government unit |

1.8.5 Implementation

The original sites are designed to accommodate 40,434 families. As of September 1994, the total completed units in all the sites are only 28,115. There is a shortfall in the completion of resettlement sites, such that 7,888 family victims of Lahar III are still in the evacuation and staging areas. In order to accelerate housing and land development, more entities should be encouraged to initiate resettlement developments.

(1) Resettlement Process

The systems and procedures followed for resettlement are adopted from those used by the Department of Agrarian Reform, with some modifications, especially on the scheduling of community organization as shown in Figures M.8 to M.10.

a) Beneficiary Screening

The DSWD is tasked with identifying the victims of lahar and floods. For the threatened areas, the local government units have identified the households within the areas vulnerable to flooding and lahar flow.

The households eligible for resettlement are those who are affected by lahar and should now be expanded to those whose areas are threatened by future floods. Households who own other lands which are safe from lahar and floods are excluded from the resettlement program, in as much as they have other alternative.

At this point, the relocation preference of the household is obtained. The options are:

- (i) Balik-probinsya (return to home province),
- (ii) Assimilation into the barangay,
- (iii) Stay with relatives and friends within the same barangay or in another barangay
- (iv) Relocate to the prepared sites: residential, agricultural, forest or craft village.

b) Community Organization

During the subsequent months when the resettlement sites are being developed, the beneficiaries can be organized and trained for their responsibilities in the resettlement areas as well as for the probable livelihood projects.

The potential leaders are identified and provided with the necessary skills to organize and mobilize the community for land development, housing construction and livelihood activities, delivery of basic services. In a community, there may be different leaders for each task.

An NGO is tasked initially to provide leadership, community organizing and technical assistance until such time that the community organization is already managed by the community members themselves.

c) Livelihood Development

The Department of Agriculture and the Department of Trade and Industry should be able to provide leads on the agricultural, forest products and crafts which are in demand, as well as the product specifications.

The community then validates whether the quality and quantity needed can be supplied by the resources available in the community, including raw materials and skills.

The community then prepares the business plan for the product or service and submits these to the members for capitalization or to the appropriate lending institution for funding assistance.

The community, itself, may be able to pool their savings in order to finance their desired livelihood projects.

d) Land acquisition

In most cases, publicly owned lands are designated as resettlement site: thus, the resettlement planners have to make do with available lands which are usually in very inaccessible locations.

Although funds are not spent to acquire lands, the same amount is needed to build access roads, to connect to main power lines and to provide all social services, facilities and amenities needed by the population.

If land is not available, land may be acquired with a grant or low interest loan. The settlers can then be organized into an association or cooperative by the local government units or non-government organizations. The cooperative then collects the payment for individual lots from individual settlers.

Inasmuch as 436 ha lands are needed to resettle all households threatened by future floods, there should be a systematic identification and acquisition of lands for resettlement purposes. All land-based infrastructure and livelihood projects should incorporate housing requirements for the intended beneficiaries of the projects.

e) Land development

For government-administered, AFP Engineering Command can be tapped for the engineering design and supervision, organization and involvement of the beneficiaries.

The government should extend its fullest support in undertaking land development in privately-owned sites in order to minimize costs.

f) Shelter construction

The various alternatives schemes for housing construction are as follows:

- Self help
- Cooperative housing
- Contractor- constructed

The selection of the construction scheme depends on the affordability and choice of the beneficiaries.

In the original sites, housing construction was proposed to be owner-constructed. However, because of the emergency instruction, the houses were contracted out, to private contracts. Normally it would take not more than (two) 2 months to complete a house, however, the construction took longer. In most sites the community facilities were completed before the housing units.

The 1994 housing program now provides cash loans to the beneficiaries, who in turn will be responsible for building their houses under the "bayanihan" scheme. Other financing schemes for housing are:

- Cash loan
- Materials loan
- Sweat equity
- Self-help

g) Beneficiaries' finance

If costs are to be recovered, settlers must be informed before hand. Housing loans are already available for members of GSIS, PAGIBIG, or SSS, however this has been suspended in the lahar affected areas. Since the coverage of threatened areas has been delineated. The suspension of housing loans should nor be lifted. For non-members, their participation in livelihood projects, land development and housing construction become their source of funds.

h) Basic Services Delivery

The community organizations should be able to identify the pressing needs of the community and the appropriate strategies and programs to acquire those basic needs. Among these may be, food production, health services, education and skills training, water supply and electricity.

(2) Institutional Mechanism

There are so many government and non-government institutions involved in Mt. Pinatubo.

a) Mt. Pinatubo Commission

As early as April 1991, the PHIVOLCS began monitoring the activity of Mt. Pinatubo and warned on its possible eruption. In May 1991, President Corazon Aquino designated the Region III Cabinet Officer for Regional Development as the Chairman of the Task Force on Mt. Pinatubo. At the same time, the National Disaster Coordinating Council was alerted and called its member agencies to plan for the imminent eruption.

The Technology and Livelihood Resource Center, through its Chairman, concurrently the Budget Secretary, took the initiative and called a meeting of all agencies to form an informal group which later comprised the Pinatubo Assist and Redevelopment Commission then, and in 1993, the Mt. Pinatubo Commission.

In each resettlement area, a mix of government and non-government agencies are involved in the various aspects of resettlement.

LGUs	Resettlement logistics
	Fund support
	Medical support
DENR	Road regravelling and access trail

	Sawn lumber
	Assorted tools
DA	Seedling materials
	Livestock dispersal
NHA	Construction materials
DSWD	Subsistence needs
	Supplemental feeding
	Information campaign on sanitation, nutrition and responsible parenthood
DOH	Medical and health services
DPWH	Infrastructure support
DTI	Skills training
ONCC	Processing and evacuation of settlers
	Rehabilitation of Aeta families
PAF	Wells

b) Local Government Unit

In the initial resettlement efforts some local government played a minimal role. Municipal/city governments should now take the lead role in planning and implementing resettlement.

The LGU should encourage private developers and private land owners within their municipalities to assist in the resettlement projects.

c) Private sector

Private developers should establish resettlement sites as a response to the 20% socialized housing project component required in RA7279.

Private land owners, especially of vacant idle lands should be encouraged to enter into joint projects with the community organization.

d) Non-government organizations

Non-government organizations have extended and may continue to provide technical assistance in developing resettlement projects and sourcing funds for this purpose. They can extend skills development training and business development. They can assist community leaders organize their communities for housing and livelihood projects.

The Philippine Red Cross provided disaster preparedness and relief services, evacuation centers and resettlement areas.

e) People's organization (cooperative)

The beneficiaries themselves should participate in decision-making by organizing themselves into cooperatives or homeowner's association and by actively planning the housing and livelihood projects within their communities.

(3) Financing

For 1994, the Mt. Pinatubo Commission budgeted 2.0 billion pesos from the General Appropriation. Of this amount, 625 million pesos is for resettlement, 197.5 million pesos is for livelihood, 177.5 million pesos is for social services and 1.0 billion pesos for infrastructure. The clamor is now to provide more for resettlement rather than infrastructures. The 1994 budget aims to provide 8,732 additional housing units, complete with communal facilities. The 1993 housing program target of 24,364 units

will be continued in 1994 for the 12,685 Lahar I and II victims. Two new sites, Mauaque, Mabalacat and Bulaon, Bacolor are proposed for development. Pandacaqui, Mexico will be expanded and a 40 ha. site at Dapdap, Mabalacat will be acquired.

The livelihood targets are 79,862 sustainable jobs and the continuation of the 1993 projects, with 162,390 beneficiaries. These should go hand in hand with the housing targets. While, the proposed rehabilitation and resettlement programs for the Aetas total 32.15 million pesos.

The resettlement projects were funded from national government appropriations, private contributions, and foreign assistance programs.

The cash donations solicited by the Philippine National Red Cross from various sources as of 31 May 1992 amounted to 66.6 million pesos. The Philippine Business for Social Progress, as of September 30, 1993 sourced 22.8 million pesos. These shows the extend of volunteerism of the Filipino as well as their foreign friend in the face of calamities.

M.2 EVACUATION

2.1 AFFECTED AND THREATENED HOUSEHOLDS

The total number of households affected by floodflows are 18,177, 49.6% of which are within affected and threatened barangays and 21.8% in the supposedly unaffected barangays. In the past rainy seasons, 51.3% of the total households within the affected barangays and 15% within the threatened barangays evacuated. In the unaffected barangays, 6% evacuated.

The estimated total households which may have to be evacuated during the rainy seasons are estimated at 21,800. Since these households have returned to the affected and threatened barangays, the need for future evacuation is highly probable. In fact, these households should be permanently evacuated and resettled in safer areas.

Affected households based on the local disaster preparedness plans can go as high as 61,983 as given in Table M.19.

2.2 DISASTER-PREPAREDNESS AND RELOCATION PLAN

2.2.1 Disaster Preparedness

In response to the disasters, a disaster management program has been instituted by the Regional, Provincial and Municipal/City Disaster Coordinating Councils. All municipalities in the areas have prepared their respective plans which cover the following:

- a) Organization of operating units and its members,
- b) Identification of food, medical, transportation, and communications resources,
- c) Identification of pick-up points, evacuation routes and temporary relocation sites.

In the event of a disaster, the Mayor or in his absence, the Chief of Police issues the call for evacuation and all teams are mobilized to operationalize the disaster management plan.

2.2.2 Evacuation

In the event of relocation, the affected population is provided with support packages under certain forms of intervention, such as relief, mitigation, rehabilitation, reconstruction and development. Each intervention is further described as follows:

(1) Relief (within 24 hours to 7 days of the occurrence of lahar or flooding)

- Food for work
- Relief Assistance
- Emergency Shelter
- Supplemental feeding
- Infrastructure rehabilitation
- Health services

(2) Mitigation

- Health and nutrition
- Information, education and communication
- Community organizing and mobilizing
- Supplemental feeding for children, pregnant and lactating women
- Seminars on disaster preparedness
- Day care service
- Infrastructures development

(3) Rehabilitation

- Livelihood options:
 - Agricultural rehabilitation
 - Agricultural development
 - Micro lending for affected workers
 - Lending to small and medium businesses
 - Self-employment assistance
 - Common service facilities
 - Health, nutrition and sanitation classes
 - Rehabilitation of school and public buildings
 - Rehabilitation of transportation systems

(4) Reconstruction and development

- Productivity centers
- NFE Literacy for Aetas
- Skills re-training
- Resettlement options
 - Lowland resettlement
 - Aeta resettlement
 - Core shelter assistance
 - Balik-probinsya (return to home provinces)
 - Assimilation into the barangay
 - Rebuilding of houses
 - Stay with relatives and friends within the same barangay
 - Stay with relatives and friends in another barangay
 - Relocate offsite or within the province

2.2.3 Process

- a) Community organizing of barangays to conduct disaster preparedness and periodic drills

- b) Determination of needs, aspirations and capacities of the victims in times of disaster
- c) Identification and mapping of resources, such as food, medical supply, water, transportation, communications and emergency equipment, including earth moving equipment
- d) Designation of warning and communications systems
- e) Preparation of pick up points, evacuation routes and relocation sites
- f) Preparation of resettlement sites

2.2.4 Local Government Preparedness

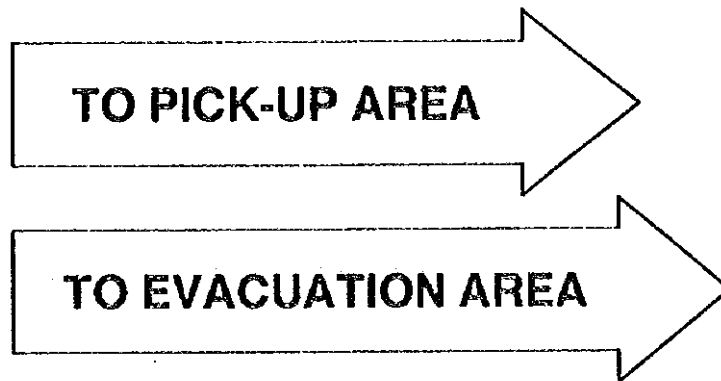
Every local government unit has prepared an evacuation plan in the event of a level 4 lahar warning. It includes the following areas of concern:

- a) Organization of different task force groups
- b) Identification and estimate of threatened population
- c) Identification and organization of a communication network, which mainly uses portable transceivers, fireworks, church bells among others.
- d) Designation of pick up points and evacuation sites, which are mostly school buildings, churches and government buildings.
- e) Inventory of available transportation facilities for evacuees
- f) Estimate of needed food relief assistance, which is premised on keeping food stock
- g) Inventory of heavy equipment needed for sand bagging and clearing of debris
- h) Identification of medical assistance personnel

2.3 EVACUATION ROUTES

The shortest routes from threatened barangays to the nearest evacuation sites should be elevated in order to prevent isolation in times of floods. However, culverts should be used to serve as passage for flood waters crossing these roads. The location of the evacuation routes are shown in Figure M.11.

Road signs like



should be placed at intersections to guide evacuees.

2.4 PICK-UP POINT

Intermediate pick-up points where evacuees can be assembled before transporting them to evacuation areas should also be marked.



The pick-up points are public areas, such as schools, churches and government office complexes.

2.5 DEVELOPMENT PLAN OF EVACUATION SITE

In times of emergency, the usual evacuation sites are the public elementary schools and government offices. Many of these are not equipped for long-term settlement. Some of the designated evacuation sites are also located in lahar and flood-prone areas. In such cases, these elementary schools should only be designated as pick-up points.

Establishing permanent resettlement sites takes considerable time. Such situation, unfortunately, puts so much stress on the evacuees. There is a need for permanent evacuation sites for the lahar and flood-prone areas to provide timely and fast services and provisional settlement.

The proposed evacuation site is at least 1.0 ha site which can accommodate bunkhouses or tents for 50 families and equipped with communal toilets, dining area, kitchen, health and sports, centers and security office.

Each evacuation site has a warehouse that can store one week food and medical supply for every affected barangay. It can also serve as a food and drug distribution center for a cluster of barangays in order to maintain fresh supplies and sustain emergency funds.

During normal times, the area can be used as a human resource development and business center for the barangay. It should be operated by a government or a private training institution or non-government organization.

The same evacuation centers can be transformed into permanent resettlement sites. New evacuation centers need to be established for future disaster events.

2.6 EVACUATION SITES

2.6.1 Red Cross Villages and Tent Cities

At the height of the evacuation immediately prior to and after the 1991 eruptions, the Philippine National Red Cross (PNRC) operated 329 evacuation centers, within Zambales, Pampanga, Tarlac and as far as Manila, Quezon City and Laguna. Evacuation sites were established by the PNRC as given in Table M.20.

On these sites, the PNRC provided tents and bunk houses, school houses, communal comfort rooms, field offices, chapels, health stations, vocational training and non-formal education centers, and relief and distribution posts.

At present, there are 73 evacuation centers, most of which are still occupied by victims of Lahar 1 and 2, numbering 26,787. Eleven (11) more were added to accommodate Lahar 3 victims, numbering 7,400. And in 1994, three existing sites were established to accommodate 2,492 victims.

2.6.2 Proposed Sites

In the local disaster preparedness plans, several evacuation sites have been identified. These are mostly government and public buildings, such as schools, churches and government offices which are usually ill-equipped to accommodate long term evacuees. In some towns the capacities of evacuation centers are below the estimated total number of families vulnerable to flood flows. There is a need to plan new evacuation sites within Mabalacat, Angeles City, Magalang, Sta. Ana and Mexico.

Considering the delineation of the PHIVOLCS and the actual survey of households and the locations vis-a-vis the affected and threatened households, the following areas are recommended as permanent evacuation sites for each municipality as given in Table M.21.

These sites are strategically distributed on each side of the rivers flowing from Mt. Pinatubo to lessen if not totally avoid, transporting the evacuees across the rivers during evacuation.

The sites which have been initially identified by the various local governments should be further evaluated. If they are located within threatened areas, these should be designated only as pick-up points.

2.7 RELIEF OPERATIONS

Food are rationed daily by the Philippine National Red Cross to as many as 140,315 families. These consist of rice, canned goods, dried fish, dried beans, and fresh vegetables.

Other items distributed include : blanket, clothes, soap, health kits, slippers, towels, toothpaste and tooth brushes and drinking glass.

Based on the disaster preparedness plans, the other requirements for evacuation are water pumps and toilets for evacuation centers, emergency lights, hand-held radios and dump trucks for transporting the evacuees.

Other relief and rehabilitation services conducted within evacuation sites are food for work and cash for work, psycho-social therapy or assistance to individuals in crisis situations, supplemental feeding to malnourished children and lactating mothers.

2.8 ORGANIZATION

The proposed organization is patterned after the rescue and evacuation plan of the Provincial Disaster Coordinating Council of Pampanga and Tarlac as well as that of the Philippine National Red Cross.

The Municipal Disaster Coordinating Council (MDCC) shall implement the plan in coordination with the Provincial Development Coordinating Council (PDCC) and local community including the private sector.

The Municipal Mayor as Chairman of the MDCC, is the key person responsible for the overall success of this endeavor. The different units which shall be organized to take charge of the required tasks are as follows:

(1) Staffing and Responsibilities

a) Municipal Mayor/Chairman

Gives final order for rescue and evacuation.

Takes overall responsibility for planning and implementation

b) Chief Police/Assistant Chairman

Acts as Team Leader for rescue and evacuation.

Takes over in the absence of the Chairman.

c) Warning and communication Unit

Provides timely information on flood incidents.

Makes communication and warning facilities available to all concerned.

d) Rescue and Evacuation Unit

Conducts rescue of people living along danger areas.

Initiates evacuation of those affected and brings them to designated safe grounds and evacuation centers.

Conducts inventory of available/still needed rescue personnel, materials and equipment.

e) Transportation Unit

Insures the availability of all needed transport resources.

Initially taps locally available transportation facilities for the operation.

Takes charge of the dispatch, movement and maintenance vehicles in the affected areas.

f) Relief and Shelter Unit

Accepts evacuees in the designated evacuation centers and acts on their immediate needs.

Provides victims with foods and clothing if necessary.

Takes charge of proper use and maintenance of the center.

g) Medical Unit

Provides medicines and medical assistance to the evacuees as well as rescuers if needed.

h) Security Unit

Secures the abandoned houses as the transport of those coordinate affected to evacuation centers.

Provides security in evacuation and relief centers.

2.9 OPERATING REQUIREMENT

In summary, the required persons and facilities are as follows:

a) Key Persons/Units Involved

- i. Municipal Mayor
- ii. Chief Of Police
- iii. Warning and Communication
- iv. Rescue and Evacuation Unit
- v. Transportation Unit
- vi. Relief and Shelter Unit
- vii. Medical Unit
- viii. Security Unit

b) Warning and Communication Facilities

- i. PLECS
- ii. PNP radio communication system
- iii. Print and broadcast media
- iv. Secondary watchpoint
- v. MDCC WCT
- vi. BDCC WCT
- vii. Private communication groups

c) Rescue and Evacuation Facilities

- i. Rescue equipment and supplies
- ii. Response teams
- iii. Evacuation teams
- iv. Assistance teams

d) Transport resources

- i. Locally-available vehicles
- ii. Owners/operators, local government and private
- iii. Drivers and assistants
- iv. Designated pick-up points

e) Relief requirements

- i. Persons/Agencies/NGO's

- ii. Current foodstock relative to total requirements
 - iii. Other sources of relief goods
 - iv. Distribution system
- f) Medical Assistance
- i. Persons/Agencies/NGO's
 - ii. Current stock relative to total requirements
 - iii. Other sources of medical supplies
 - iv. Distribution system
- g) Security and Traffic
- i. Security details of affected barangays and evacuation centers
 - ii. Principal and alternate traffic routes
 - iii. Personnel required

2.10 OPERATIONAL PROCEDURES

- a) Population at risk shall be evacuated according to procedures established by the MDCC.
- b) Priorities shall be determined prior to rescue and evacuation efforts.
- c) Rescue and evacuation shall be done as necessary and as a major responsibility of the MDCC.
- d) The Municipal Mayor as Chairman shall call the evacuation order.
- e) The Chief of Police calls the evacuation order in the absence of the Chairman.
- f) The Barangay Captain/Chairman of the BDCC shall act as overseer for his barangay.
- g) Selected members of affected families shall remain in the affected area to secure the community as long as safety permits.

2.11 PHASES OF OPERATION

(1) Phase 1 - (Preparatory Stage)

- a) Orient all concerned on this plan.
- b) Conduct related meetings and briefing sessions.
- c) Acquire necessary materials and equipment
- d) Identify priority areas
- e) Organize volunteer groups

(2) Phase 2 - (Emergency Stage)

- a) Activate MDCC and its Emergency Operations Center.
- b) Dispatch proper disaster warning
- c) Provide timely information on actual flooding incidents.
- d) Rescue endangered population.
- e) Supervise movement of affected persons to evacuation centers.
- f) Provide foods and medical assistance to evacuees.
- g) Proper maintenance of evacuation and relief centers.
- h) Conduct situation survey and damage assessment.

- i) Monitor and report.
- j) Conduct meetings and briefing for council members and others concerned.
- k) Undertake pre-evaluation and initial recommendations.

(3) Phase 3 - (Post Emergency Stage)

- a) Conduct DCC meeting for final evaluation of situation
- b) Prepare final disaster report.
- c) Reward and recognize all who participated in the operation.
- d) Deactivate the EOC.

2.12 COORDINATING GUIDELINE

- a) Implementation of any activity provided for in the plan shall be properly coordinated with all concerned.
- b) Locally available resources, both financial and material shall be fully tapped in response to the emergency.
- c) Immediate response to local disaster situation is a primary responsibility of the MDCC concerned.

2.13 FUNDING

Evacuation and relief operations are obtained from the budgetary allocations of the Department of Social Welfare and Development. In 1994 the estimated requirements for the social services programs amounted to 177.5 million pesos.

At the local government units, 5% of the respective municipal budgets are reserved for disaster control activities and the national government allocates amounts ranging from P200,000 to P400,000. These amounts are not sufficient for the implementation of effective disaster control programs.

Project funding for voluntary non-government organizations, is obtained from donations gathered here and abroad. As mentioned in the resettlement chapter, the Philippine National Red Cross alone solicited 66.8 million pesos for relief and resettlement operations.

TABLES



Table M.1 Families Served in Permanent Evacuation Centers

PROVINCE	PERMANENT EVACUATION CENTERS STAGING AREAS	NO. OF FAMILIES			TOTAL
		LAHAR 1,2	LAHAR 3	LAHAR 4	
PAMPANGA	Angeles Evacuation Centers	1,879	-	-	1,879
	Bacolor Evacuation Centers	990	-	951	1,941
	Cabangalan Staging Area	-	451	-	451
	CABCOM/Mabalacat Evacuation Centers	6,378	-	-	6,378
	Floridablanca Evacuation Centers	751	-	-	751
	Porac - Pio	-	605	-	605
	Porac - Senor	-	151	-	151
	Porac Evacuation Centers	1,692	-	987	2,679
	San Fernando Evacuation Centers	1,959	-	554	2,513
	San Pedro Staging Area	-	400	-	400
	Sta. Monica Staging Area	-	295	-	295
	Sta. Rita Bunkhouses/Evacuation Centers	519	215	-	734
SUB-TOTAL	14,171	2,123	2,492	18,786	
TARLAC	A D R A Bunkhouses	95	-	-	95
	Alfonso Bunkhouses	400	-	-	400
	Bamban Evacuation Centers	4,613	835	-	5,448
	Capas Evacuation Centers	871	12	-	883
	Capas Longhouses	300	-	-	300
	Concepcion Evacuation Centers	2,805	326	-	3,131
	I F L Bunkhouses	20	-	-	20
	N O L C O M	200	-	-	200
	O'Donnel Bunkhouses	300	-	-	300
	SUB-TOTAL	9,604	1,173	-	10,777
ZAMBALES	Botolan Staging Area	-	336	-	336
	Bulawen Bunkhouses/Tent Cities	1,706	-	-	1,706
	Castillejos Evacuation Centers	-	79	-	79
	Castillejos Staging Area	-	442	-	442
	Olongapo Evacuation Centers	-	43	-	43
	Palauig Evacuation Centers	334	522	-	856
	San Felipe Evacuation Centers	20	-	-	20
	San Marcelino Evacuation Centers	-	850	-	850
	San Marcelino Staging Area	-	1,680	-	1,680
	Subic Evacuation Centers	952	-	-	952
Subic Staging Area (PHILSECO)	-	152	-	152	
SUB-TOTAL	3,012	4,101	-	7,116	
GRAND TOTAL		26,787	7,400	2,492	36,679

Source: Clark Air Base Commander (CABCOM)

**Table M.2 Government Resettlement Program for Aetas
as of 1993**

Resettlement	Land Area (km ²)	No. of Families
Zambales		
1. Baquiilan, Botolan	3.93	720
2. Loob-Bunga	2.98	1,549
3. Dampay-Salaza	6.52	1,184
4. Cawag, Subic, Zambales	8.24	1,600
5. New Iram, Cabalan, Olongapo	1.00	700
Subtotal	22.67	5,753
Tarlac		
1. Kalangitan, Capas	1.23	376
2. Dueg, San Clemente	11.00	2,000
Subtotal	12.23	2,376
Pampanga		
1. Villa Maria, Porac	0.12	350
2. Camias, Porac	0.12	353
3. Nabuklod, Floridablanca	4.03	301
Subtotal	4.27	1,004
Total	39.17	9,133

Source: Adapted from Bautista, M.C.R.B., "Responses to the challenge of Mt. Pinatubo in the first two years"

In: Bautista, M.C.R.B., (ed.),

In the shadow of the Lingering Mt. Pinatubo Disaster, 1993, pp.51.

**Table M.3 Numbers of Households Affected by Flood Flow
In Sacobia-Bamban and Abacan River Basin**

Province/Municipality/ Barangay	Affected By Floodflows	Not Affected by Floodflows	Total
PAMPANGA and TARLAC	18,177	20,538	38,715
Threatened barangays	16,746	17,012	33,758
Affected barangays	611	580	1,191
Unaffected barangays	820	2,946	3,766
% share	47.0	53.0	100.0
PAMPANGA PROVINCE	9,761	12,962	22,723
Threatened barangays	8,622	9,705	18,327
Affected barangays	319	439	758
Unaffected barangays	820	2,818	3,638
% share	43.0	57.0	100.0
TARLAC PROVINCE	8,416	7,576	15,992
Threatened barangays	8,124	7,307	15,431
Affected barangays	292	141	433
Unaffected barangays	0	128	128
% share	52.6	47.4	100.0

Source: JICA's survey (August 1994)

**Table M.4 Number of Acta Families in Tarlac and Pampanga
as of August 1994**

Province/Municipality/ Sitio	Number
Total in Resettlement Site and Off-Site Settlements	5,575
<u>In Resettlement Site:</u>	
Pampanga and Tarlac Total	1,521
Pampanga	533
Tarlac	988
<u>Off-site Settlements:</u>	
Pampanga Total	1,550
Angeles City	91
Floridablanca	339
Mabalacat	251
Magalang	291
Porac	578
Tarlac Total	2,504
Bamban	303
San Clemente	271
Capas	980
San Jose	852
Tarlac	98

Source of Data: Office of Northern Cultural Communities
(ONCC), San Fernando, Pampanga

Table M.5 Characteristics of Actas in Resettlement Sites in 1992 (1/2)

	AYALA	PLANAS	NABUKLOD FLORIDABLANCA	DUEO San Clemente	Kalangitan, Cutcut, Capas
Number of evacuees					
Individuals	830	1469	557	3002	1612
Families	199	401	61	683	347
Survey Sample					
Individuals	18	14	10	72	36
Families members	83	57	65	4	5
Ave. Household Size	4	4	8	4	5
Ethnic mix	Pure actas	Pure actas	Pure actas	Pure actas	Actas; 70% Lowlanders-30%
Origin	Marcos Village Pasbul Mabalacat Sapang Bato	Cuyucut Diaz Lilip Patal Pasbul	Nabuclo Pasbul Labuan	Patal-bato Patal-pinto Mag-ube Flora Bilad**	Maruglu Malasa Gataman
Religion	Baptist Roman Catholic Christians	Christians Roam Catholics	Roman Catholics Christians		Christians- 50% Catholics-45% Anitos-5%
Occupation	Farming				
Average HH income Pre-eruption	1500-1990 1992 Only 10% had an income of P3,600-P5,400	500-999 0	500-999 0	500-999 0	1000-1999 0
Preferred Livelihood					
Farming	55.56%	35.71%	35.71%	47.22%	36.51%
Poultry and livestock raising	88.89%	42.86%	42.86%	47.22%	55.56%
Basketry	11.11%	14.29%	14.29%		
Bow & arrow making	5.56%			2.78%	
Soap-making	5.56%				
Sari-sari store		7.14%	7.14%	1.39%	
Vending					4.76%
Construction				1.39%	1.59%
Garment-making					1.59%
Housing					
Area	6 sq m.			2.4x4	
Walls	Sawali	nipa/bamboo	nipa/bamboo	nipa/bamboo	nipa/bamboo
Roof	cogon	tents	tents	cogon	cogon
Access		4-km from Porac		Inaccessible during the rainy season	7kms from Highway
Electricity	none	none	none	none	none
Water supply	Communal faucets	Cans of water were purchased	Cans of water were purchased	Cans and hose from spring	Common wells Springs
Used toilets	Communal, pit type	21.43%	30.00%	58.33%	75.00%
Morbidity rate per 1,000	361	3,921	3,467	166	86
Deaths per 1,000		17.02			
Health services	Magalang Health Center	Daily visiting doctor	Res. Medical Health Officer	Resident Doctor Health Center	Health Center Hospital
Nutrition					
Severely underweight	5.61%	16.82%	1.33%	13.04%	2.46%
Moderately underweight	10.71%	15.89%	6.00%	12.17%	5.91%
Mildly underweight	25.51%		0.67%	0.00%	17.98%
Educational attainment					
No education	60.61%	76.67%		45.80%	45.93%
Elementary	39.39%	23.33%		50.70%	45.42%
High School				3.50%	6.21%
College					2.44%

Table M.5 Characteristics of Aetas in Resettlement Sites in 1992 (2/2)

	AYALA	PLANAS	NABUKI, OD FLORIDA, BIANCA	DUEG San Clemente	Kalangitan, Cutcut, Capas
Membership in community organizations	5.56%	21.43%	20.00%	8.78%	11.11%
Willingness to participate in community activities	33.33%	50.00%	50.00%	42.65%	62.50%
Perception of Living Conditions/Reasons					
Worse	88.89%	71.43%	90.00%	40.28%	88.89%
Lack of food	55.56%	14.29%	30.00%	9.72%	8.70%
No work	16.67%	35.71%	30.00%	15.28%	45.65%
No farm	22.22%	21.43%	30.00%	8.33%	17.39%
no income	12.50%	0.00%	0.00%		17.39%
Better	11.11%	21.43%	10.00%	58.33%	2.78%
Food ration	11.11%			36.11%	2.78%
No need to work				13.89%	
Environment and amenities				2.78%	
Safety				9.72%	2.78%
Factors needed to change living conditions					
Cannot tell	61.11%				
Business	22.22%	36.36%			20.00%
Jobs	16.67%	36.36%	30.77%	18.60%	50.00%
Farm		27.27%	38.46%	34.88%	30.00%
Livelihood				46.51%	
Capital			15.38%		
Return home			15.38%		
Acceptability of assistance					
Livelihood	66.67%	28.81%		43.08%	50.00%
Health	61.11%	23.73%		13.85%	18.75%
Food	55.56%	8.47%		11.79%	2.08%
Water	11.11%	11.86%		8.21%	5.21%
Electricity	11.11%	15.25%		17.44%	9.38%
Schools				0.01025641	2.08%
Transportation					8.33%
Housing materials					4.17%
Acceptability of resettlement	61.11%	57.14%	60.00%		

Other origin-sitios of Dueg settlers: Bilad, Doray, Settler, Bulacan
Malyabon, Kawayan, Burog, Mataba, Malasa, Malanay, San Martin, Sta. Rosa
Gaguingan, Gayaman, Malay-uyong

Survey of Kalangitan covered only the Aeta population

Source : Development Partners Inc., Profiles of the Ayala, Planas, Mabuclod, Dueg and Kalangitan
Evacuation and Resettlement Areas, 1992

Table M.6 Population and Household in the Study Area

Province/Municipality/ Barangay	Population		Annual Growth Rate		Households		Annual Growth Rate 90-94	Average H/Hold Size 1994
	1980	1990	1994	80-90	90-94	1990		
PAMPANGA and TARLAC								
Threatened barangays	555,692	727,794	678,910	2.70%	-1.74%	137,320	132,898	-0.82%
Affected barangays	172,097	213,719	179,590	2.17%	-4.35%	40,324	33,758	-4.44%
Unaffected barangays	96,836	129,438	123,880	2.90%	-1.10%	24,423	23,820	-0.62%
	286,759	384,637	375,440	2.94%	-0.61%	72,573	75,320	0.93%
PAMPANGA PROVINCE								
Threatened barangays	436,500	571,680	540,370	2.70%	-1.41%	107,866	106,247	-0.38%
Affected barangays	95,919	113,694	100,910	1.70%	-2.98%	21,452	18,327	-3.94%
Unaffected barangays	61,334	83,763	77,980	3.12%	-1.79%	15,805	15,160	-1.04%
	279,247	374,223	361,480	2.93%	-0.87%	70,609	72,760	0.75%
TARLAC PROVINCE								
Threatened barangays	119,192	156,114	138,540	2.70%	-2.99%	29,456	26,651	-2.50%
Affected barangays	76,178	100,025	78,680	2.72%	-6.00%	18,873	15,431	-5.03%
Unaffected barangays	35,502	45,675	45,900	2.52%	0.12%	8,618	8,660	0.12%
	7,512	10,414	13,960	3.27%	7.33%	1,965	2,560	6.61%

Note: The 1994 population and households of affected and unaffected barangays were estimated based on 5% sampling survey of households. The 1980 and 1990 population were based on the National Statistics Office (NSO) census on population and housing.

Threatened barangays refer to barangays listed as "affected barangays" in tender document. Affected barangays refer to barangays listed by PHILVOLCS as affected by 1991-1993 pyroclastic flow, lahar deposits, and lahar dammed lake/ponded water. These were originally listed as "unaffected barangays" in tender documents. Unaffected barangays refer to barangays listed as "unaffected barangays" in tender documents.

Table M.7 Number of Households by Residence in the Study Area (May 1990)

Province/Municipality/ Barangay	Residence in May 1990										Total	
	Same House	Same Brgy	Same City/Mun	Same Prov	Another Prov	Foreign Country	NA/Nw HHold	No Response				
PAMPANGA and TARLAC												
Threatened barangays	117,314	5,587	5,598	1,160	681	53	400	2,023				132,816
Affected barangays	30,774	747	1,338	140	121	13	120	423				33,676
Unaffected barangays	19,540	2,020	860	760	160	20	120	340				23,820
% Share	67,000	2,820	3,400	260	400	20	160	1,260				75,320
	88.3	4.2	4.2	0.9	0.5	0.0	0.4	1.5				100.0
PAMPANGA PROVINCE												
Threatened barangays	92,136	5,311	4,768	1,128	635	50	374	1,845				106,247
Affected barangays	16,716	511	508	108	95	10	94	285				18,327
Unaffected barangays	10,980	1,980	860	760	140	20	120	300				15,160
% Share	64,440	2,820	3,400	260	400	20	160	1,260				72,760
	86.7	5.0	4.5	1.1	0.6	0.0	0.4	1.7				100.0
TARLAC PROVINCE												
Threatened barangays	25,178	276	830	32	46	3	108	178				26,651
Affected barangays	14,058	236	830	32	26	3	108	138				15,431
Unaffected barangays	8,560	40	0	0	20	0	0	40				8,660
% Share	2,560	0	0	0	0	0	0	0				2,560
	94.5	1.0	3.1	0.1	0.2	0.0	0.4	0.7				100.0

Remarks: Brgy - Barangay, Mun - Municipality, Prov. - Province

Note: Attached and unaffected barangays were estimated based on 5% sampling survey of households.

Table M.8 Households Migration Profile

Province/Municipality/ Barangay	1	2	3	4	5	6	7	8
	Households 1990	Households 1994	Annual Growth Rate 90-94	Change in No of HHs From 1990- 1994	Total HHolds Immigrated to Brgy (after 1990)	Net Natural Increase of HHolds	Resettled and Evacuated HHolds	Estimated No. of HHolds Emigrated to Other Areas
PAMPANGA and TARLAC								
Threatened barangays	137,320	132,898	-0.82%	(4,422)	7,492	3,070	6,365	4,912
Affected barangays	40,324	33,758	-4.44%	(6,566)	1,612	4954	4,235	3,365
Unaffected barangays	24,423	23,820	-0.62%	(603)	1,800	1,197	912	820
	72,573	75,320	0.93%	2,747	4,080	6,827	1,218	727
PAMPANGA PROVINCE								
Threatened barangays	107,866	106,247	-0.38%	(1,619)	6,581	4,963	4,810	1,478
Affected barangays	21,452	18,327	-3.94%	(3,125)	721	2404	2,714	834
Unaffected barangays	15,805	15,160	-1.04%	(645)	1,780	1,135	882	0
	70,609	72,760	0.75%	2,151	4,080	6,231	1,213	644
TARLAC PROVINCE								
Threatened barangays	29,456	26,651	-2.50%	(2,805)	911	(1,894)	1,556	3,434
Affected barangays	18,873	15,431	-5.03%	(3,442)	891	(2,551)	1,521	2,531
Unaffected barangays	8,618	8,660	0.12%	(42)	20	62	30	820
	1,965	2,560	6.61%	595	0	595	5	83

Note: 4 Refer to 1990 HHolds less 1994 HHolds (1-2)

5 Refer to Table 11.1

6 Refer to HHolds in 1994 less Total HHolds Immigrated (2-5) which was assumed as net natural increase/decrease of HHolds

7 Refer to HHolds in resettlement centers and evacuation/staging areas as of August 1994.

8 Refer to the number of HHolds possibly immigrating to other areas (e.g. Metro Manila, Bataan, Nueva Ecija, Palawan, Bulacan).

Table M.9 Number of Households by Size

Province/Municipality/ Barangay	Household size (No. of persons per household)											Total					
	1	2	3	4	5	6	7	8	9	10	>10						
PAMPANGA and TARLAC																	
Threatened barangays	1,016	8,754	18,451	27,383	29,271	19,497	12,358	7,133	4,277	3,428	1,330	132,898					
Affected barangays	416	2,534	4,431	5,723	6,251	5,297	3,638	2,393	1,457	1,088	530	33,758					
Unaffected barangays	80	1,540	3,320	4,800	4,760	3,920	2,360	1,280	680	780	300	23,820					
% Share	520	4,680	10,700	16,860	18,260	10,280	6,360	3,460	2,140	1,560	500	75,320					
	0.8	6.6	13.9	20.6	22.0	14.7	9.3	5.4	3.2	2.6	1.0	100.0					
PAMPANGA PROVINCE																	
Threatened barangays	775	6,482	14,693	22,647	24,443	15,234	9,760	5,378	3,218	2,580	1,037	106,247					
Affected barangays	215	1,102	2,153	3,027	3,423	2,974	2,080	1,398	898	680	377	18,327					
Unaffected barangays	40	860	2,180	3,080	3,240	2,580	1,640	700	260	380	200	15,160					
% Share	520	4,520	10,360	16,540	17,780	9,680	6,040	3,280	2,060	1,520	460	72,760					
	0.7	6.1	13.8	21.3	23.0	14.3	9.2	5.1	3.0	2.4	1.0	100.0					
TARLAC PROVINCE																	
Threatened barangays	241	2,272	3,758	4,736	4,828	4,263	2,598	1,755	1,059	848	293	26,651					
Affected barangays	201	1,432	2,278	2,696	2,828	2,323	1,558	995	559	408	153	15,431					
Unaffected barangays	40	680	1,140	1,720	1,520	1,340	720	580	420	400	100	8,660					
% Share	0	160	340	320	480	600	320	180	80	40	40	2,560					
	0.9	8.5	14.1	17.8	18.1	16.0	9.7	6.6	4.0	3.2	1.1	100.0					

Note: Affected and unaffected barangays were estimated based on 5% sampling survey of households.

Table M.10 Population by Age Group in the Study Area

Province/Municipality/ Barangay	Broad Age Group (in Years)			Total
	Under 15	15 to 64	Over 64	
PAMPANGA and TARLAC	234,241	425,856	18,813	678,910
Threatened barangays	66,061	107,916	5,613	179,590
Affected barangays	43,720	76,920	3,240	123,880
Unaffected barangays	124,460	241,020	9,960	375,440
% share	34.5	62.7	2.8	100.0
PAMPANGA PROVINCE	183,700	342,033	14,637	540,370
Threatened barangays	36,460	61,033	3,417	100,910
Affected barangays	28,280	48,060	1,640	77,980
Unaffected barangays	118,960	232,940	9,580	361,480
% share	34.0	63.3	2.7	100.0
TARLAC PROVINCE	131,464	64,275	74,883	270,622
Threatened barangays	35,724	17,615	19,683	73,022
Affected barangays	24,540	12,060	13,940	50,540
Unaffected barangays	71,200	34,600	41,260	147,060
% share	48.6	23.8	27.7	100.0

Note: Population in affected and unaffected barangays were estimated based on 5% sampling survey of households.

Table M.11 Number of Households by Annual Income

Province/Municipality/ Barangay	Annual Income (in Pesos)													Total			
	<1T	>1T to 5T	>5T to 10T	>10T to 20T	>20T to 30T	>30T to 40T	>40T to 50T	>50T to 75%	>75T to 100T	>100T							
PAMPANGA and TARLAC																	
Threatened barangays	1,171	1,421	4,920	19,214	18,585	21,663	15,243	23,887	10,362	16,432	132,898						
Affected barangays	471	681	2,100	6,294	5,225	5,083	3,623	5,167	2,082	3,032	33,758						
Unaffected barangays	240	160	560	2,980	3,600	3,780	2,800	4,740	1,940	3,020	23,820						
% Share	460	580	2,260	9,940	9,760	12,800	8,820	13,980	6,340	10,380	75,320						
	0.9	1.1	3.7	14.5	14.0	16.3	11.5	18.0	7.8	12.4	100.0						
PAMPANGA PROVINCE																	
Threatened barangays	1,008	974	3,634	15,182	14,058	18,049	12,047	19,370	8,388	13,537	106,247						
Affected barangays	308	314	1,134	3,482	2,638	2,789	1,907	2,910	1,128	1,717	18,327						
Unaffected barangays	240	100	300	2,020	2,080	2,840	1,620	3,060	1,140	1,760	15,160						
% Share	460	560	2,200	9,680	9,340	12,420	8,520	13,400	6,120	10,060	72,760						
	0.9	0.9	3.4	14.3	13.2	17.0	11.3	18.2	7.9	12.7	100.0						
TARLAC PROVINCE																	
Threatened barangays	163	447	1,286	4,032	4,527	3,614	3,196	4,517	1,974	2,895	26,651						
Affected barangays	163	367	966	2,812	2,587	2,294	1,716	2,257	954	1,315	15,431						
Unaffected barangays	0	60	260	960	1,520	940	1,180	1,680	800	1,260	8,660						
% Share	0	20	60	260	420	380	300	580	220	320	2,560						
	0.6	1.7	4.8	15.1	17.0	13.6	12.0	16.9	7.4	10.9	100.0						

Note: Affected and unaffected barangays were estimated based on 5% sampling survey of households.
T - Thousand Pesos

Table M.12 Household Population by Employment Status in 1994

Province/Municipality/ Barangay	In the Labor Force		Not in the Labor Force	Total
	Employed	Not Employed		
PAMPANGA and TARLAC	233,263	89,627	121,759	444,649
Threatened barangays	58,483	24,767	30,279	113,529
Affected barangays	38,660	18,240	23,240	80,140
Unaffected barangays	136,120	46,620	68,240	250,980
% share	52.5	20.2	27.4	100.0
PAMPANGA PROVINCE	191,734	66,572	98,347	356,653
Threatened barangays	35,334	11,372	17,747	64,453
Affected barangays	24,380	10,780	14,520	49,680
Unaffected barangays	132,020	44,420	66,080	242,520
% share	53.8	18.7	27.6	100.0
TARLAC PROVINCE	41,529	23,055	23,412	87,996
Threatened barangays	23,149	13,395	12,532	49,076
Affected barangays	14,280	7,460	8,720	30,460
Unaffected barangays	4,100	2,200	2,160	8,460
% share	47.2	26.2	26.6	100.0

Note: Population in affected and unaffected barangays were estimated based on 5% sampling survey of households.

Table M.13 Unemployed Population by Type of Skills

Province/Municipality/ Barangay	Farm Farming	Book Keeping	Program ing	Secl	Beauty Culture	Dress Making	Baking Cooking	Embry	Car- penry	Driving	Elec.	Auto mech.	Others	Total Res- ponses
PAMPANGA and TARLAC														
Threatened barangays	1,134	189	195	493	215	1,481	3,704	278	947	1,017	343	357	3,712	14,065
Affected barangays	778	120	125	330	122	1,181	3,244	223	546	643	190	197	3,169	10,858
Unaffected barangays	27	7	5	23	21	55	74	1	42	30	13	14	125	437
	329	62	65	140	72	245	386	54	359	344	140	146	418	2,760
PAMPANGA PROVINCE														
Threatened barangays	827	176	157	355	199	920	2,426	241	929	784	257	271	2,202	9,744
Affected barangays	486	107	88	199	122	668	1,978	186	540	418	107	116	1,737	6,752
Unaffected barangays	13	7	4	16	5	16	70	1	31	22	11	9	63	268
	328	62	65	140	72	236	378	54	358	344	139	146	402	2,724
TARLAC PROVINCE														
Threatened barangays	307	13	38	138	16	561	1,278	37	18	233	86	86	1,510	4,321
Affected barangays	292	13	37	131	0	513	1,266	37	6	225	83	81	1,432	4,116
Unaffected barangays	14	0	1	7	16	39	4	0	11	8	2	5	62	169
	1	0	0	0	0	9	8	0	1	0	1	0	16	36

Note: Affected and unaffected barangays based on responses of 5% sample households.

Total responses may not be equal to total employed and unemployed population due to cases of multiple responses from some respondents.

Table M.14 Employment Persons at Least 15 Years Old by Major Occupation

Province/Municipality/ Barangay	Writers House										Baskery					
	Prof'l Tech'l & Rel Work	Admni. Exec & Mg'l Worker	Cler'l & Other Related Workers	Sales Workers	Cooks	Barten- ders & Related	House helpers & Laundry women	Famers, fishermen, etc.	Tailors, d'makers etc.	Elec- trician	Black- smiths Welders	Motor vehicle drivers	Auto Mechanics	weavers & related workers	Others	Total
PAMPANGA and TARLAC	13,721	3,396	10,957	32,464	2,223	3,725	8,398	7,787	30,200	11,760	3,403	2,660	4,628	5,113	74,440	238,070
Threatened barangays	1,770	393	1,401	4,289	400	331	1,647	394	7,010	2,153	414	445	593	610	19,996	45,383
Affected barangays	2,267	693	2,091	5,758	321	1,084	1,859	740	5,571	2,069	675	736	1,064	1,591	13,208	44,243
Unaffected barangays	9,684	2,310	7,465	22,417	1,502	2,310	4,892	6,653	17,619	7,538	2,314	1,479	2,981	2,912	41,236	148,444
PAMPANGA PROVINCE	12,245	2,945	10,177	29,516	2,148	2,803	7,055	7,568	24,040	10,722	3,081	2,311	21,295	5,007	57,601	202,584
Threatened barangays	1,720	381	1,359	4,145	394	321	1,585	382	6,813	2,111	398	433	3,418	606	10,605	35,236
Affected barangays	1,062	446	1,571	3,554	284	267	738	565	1,323	1,198	401	430	3,157	1,489	7,247	24,380
Unaffected barangays	9,463	2,118	7,247	21,817	1,470	2,215	4,732	6,621	15,904	7,413	2,282	1,448	14,720	2,912	39,749	142,968
TARLAC PROVINCE	1,476	451	780	2,948	75	922	1,343	219	6,160	1,038	322	349	1,900	106	16,839	35,486
Threatened barangays	50	12	42	144	6	10	62	12	197	42	16	12	129	4	9,391	10,147
Affected barangays	1,205	247	520	2,204	37	817	1,121	175	4,248	871	274	306	1,359	102	5,961	19,863
Unaffected barangays	221	192	218	600	32	95	160	32	1,715	125	32	31	412	0	1,487	5,476

Table M.15 Number of Households by Area Classification

Province/Municipality/ Barangay	Urban	Rural		Total
		Upland	Lowland	
PAMPANGA and TARLAC	47,426	3,433	80,747	131,606
Threatened barangays	4,226	2,593	26,939	33,758
Affected barangays	9,920	0	12,608	22,528
Unaffected barangays	33,280	840	41,200	75,320
% share	36.0	2.6	61.4	100.0
PAMPANGA PROVINCE	47,426	953	57,868	106,247
Threatened barangays	4,226	113	13,988	18,327
Affected barangays	9920	0	5240	15,160
Unaffected barangays	33280	840	38,640	72,760
% share	44.6	0.9	54.5	100.0
TARLAC PROVINCE	0	2,480	22,879	25,359
Threatened barangays	0	2,480	12,951	15,431
Affected barangays	0	0	7,368	7,368
Unaffected barangays	0	0	2,560	2,560
% share	0.0	9.8	90.2	100.0

Note: Population in affected and unaffected barangays were estimated based on 5% sampling survey of households.

Table M.16 Profile of Existing Resettlement Sites in Pampanga and Tarlac
Study Area: September 30, 1994 (1/2)

Name of Resettlement	Location	Area (In ha)	Capacity		Land Ownership	Classification
			(No. of Families)	No. of Resettled Families		
PAMPANGA AND TARLAC		5,909	32,428	15,127		
PAMPANGA		179	9,622	8,207		
Mauaque	Sapang Biabas, Mabalacat	47	2,800	2,347	donated by Gonzalez estate	rural lowland
Camachile	Camachile, Mabalacat	27	1,241	1,241	gov't land	rural lowland
EPZA	Pulong Cacutod, Angeles City	35	2,003	2,003	gov't land	urban lowland
Pandacaqui	Pandacaqui, Mexico	63	2,913	2,208	gov't land	rural lowland
Maryland	Sapang Biabas, Mabalacat		176	176	private	rural lowland
Buensuceso	Buensuceso	8	489	232	private	rural lowland
Dapdap Integrated Agricultural Community Project	Sitio Caldera Bgy. Dapdap Mabalacat	146	2,500	300	gov't land	rural lowland

Table M.16 Profile of Existing Resettlement Sites in Pampanga and Tarlac
Study Area: September 30, 1994 (2/2)

Name of Resettlement	Location	Area (In ha)	Capacity		Land Ownership	Classification
			(No. of Families)	No. of Resettled Families		
TARLAC		5,730	22,806	6,920		
O'Donnell	Navy Site, Capas	348	12,448	3,216	gov't land	rural lowland
Dapdap	Anupul, Bamban	150	6,200	2,040	gov't land	rural lowland
Kalangitan	Cutcut 2, Capas	750	573	449	gov't land	rural upland
Minang	San Nicolas, Sto. Nino, Anupul, San Roque, Bamban	3,234	2,000	116	U.S. reservation	rural upland
Villa Concepcion	Anupul, Bamban	11	335	335	private	rural lowland
Dueg	Maasin, San Vicente	1,234	1,000	518	Government	rural upland
Suiso	Tarlac, Tarlac	3	250	246	Government	rural lowland

Source: Resettlement Sites, MPC, DSWD

Table M.17 Summary of Facilities in Existing Resettlement Sites in Pampanga and Tarlac Study Area as of September 30, 1994 (1/2)

Resettlement	Housing (completed)	Water System	Drainage Network	Road Network	Electrification	School Facilities	Health Facilities	Community Facilities
PAMPANGA								
Manaque	2,800	4 water tanks w/pump; 18m. of dist line; 118 units deep well	16,928 kms	Main road-2,778 kms	Main line-2,778 kms	Day care center	10-bed clinic	Multi-purp. hall-180 kms
Carnachile	1,241	Completed restoration of dist. lines in residential areas	Drainage & flood cont. system needed	Unsettled right of way for access road to Phase II; improvement and rehabilitation of road ways	Phase I energized; Phase II not started	Day care center 16 classrooms elementary	10-bed clinic unstarted	Market/talipapa; open basketball court
EPZA	1,989	3 units of elevated tank; ind. faucet	Underground drainage	Internal road 100% cemented; access road is bgy. road of Bgy. Pulong Cacuted (cemented)	Ind. meters provided by Angeles Elec. Co. HH connection 2,003 8 units street light in main road	Elem.-9 bldgs. H.S.-4 bldgs. Day care-2 bldgs.	10-bed clinic construction on-going	3 chapels, multi purp. hall and markets (on-going const.) shops/stores (100), 2 basketball courts, PNP station
Pandacaqui	2,360	Water dist. completed	none	Internal road cements access road-bgy.road	Dist. line 85% comp. community partially energized	Day care center Primary Secondary	10-bed clinic	Recreational center, town hall, fire station, police station, market/talipapa
Maryland	176	Water dist. line plan	none	Combination of earth-filled and cemented roads	in planning stage	none	plan for 1 clinic	Multi-purpose hall
Buensuceso	350	50 units artesian well	Open drainage	Cemented road	only sash factory ha power	Plan for school bldg.	Plan for a health facility	Livelihood center funded by La Trinidad Foundation
Dapdap Integrated Agricultural community Project*	300	Level II Water System, 150 deep wells	Open drainage	Cemented road Network, 1.2 km in length and 15 m wide	PELCO provided	60 sq.m. day care and a 12 classroom building	120 sq.m. health center	600 sq.m. multi-purpose center; 300 sq.m. admin. bldg. 350 sq.m. wet market

* Projects in the pipeline

Table M.17 Summary of Facilities in Existing Resettlement Sites in Pampanga and Tarlac Study Area as of September 30, 1994 (2/2)

Resettlement	Housing (completed)	Water System	Drainage Network	Road Network	Electrification	School Facilities	Health Facilities	Community Facilities
TARLAC								
O'Donnell	2,409	78 deepwells; piped system non-operational	Pipeline	Concrete internal road access road-Prov. road	TARELCO	Two-storey HS bldg. 6X8 m. day care ctr. 576 sq.m. elem. bldg.	10-bed clinic	Social hall, 10 unit market; 12 productivity centers, Municipal hall, gym
Dapdap	3,378	3 water tanks; 12 deepwells; 3 pumphouses	existing	Prim. road-1.5 m. wide Sec. road-10 m. wide Tert. rd.-10 m. wide	TARELCO	16X16 ft day care center, w/elem. and H.S. bldg.	30-bed clinic	Town hall, gym, fire sm, police station
Kalangitan	2,101	4 out of 27 units deepwell operational	none	Earth-filled road	none	1 day center, Elem.-14 classrooms H.S.-3 classrooms	4-bed clinic	Gym, market, productivity center, gov't center, basketball court, 1 seedling nursery, 1 CAFGU sm.
Mainang	1,688	12 units deepwells; 4 units on-going const.		3.5 km. concrete rd.-Dapdap-Mallari; 1.5 km. concrete rd.-Mainang Ctr.-Matagpo; 5 km. concrete rd. on-going	none with plans to tap power from Dapdap side thru NEA			Plan for 30 has. recreational town plaza, other comm. facilities
Villa Concepcion	235 Tent 1000 Perm shelter	67 Units deepwell	none	Earth filled, develop of roads are under petition of Mayor's office	none Electrification now under petition of the Mayor's office at streetlights	Prep. Gr. 1 & 2 5 teachers utilizing 5 old houses in the area	None, go to Center medicines are taken free from SAWT office in town	None
Doeg	709	2 springs, cemented tanks	none	earth-filled	none	Elem. schools 4 classrooms; teachers living quarters	health center	Children's playground, tribal market, view desk, multi-purpose hall
Suiso	250	25 deepwell pumps	none	Asphalt	TEI			none

Table M.18 Examples of Resettlement Services

ABTA SETTLEMENTS	LOWLAND SETTLEMENTS
<p>a) <u>Short term</u> Housing materials Carpentry tools Housing utensils Farm animals Farming provisions</p>	<p>Community organizing Education Nutrition Soup kitchen management Basic emergency medical and preventive health services Hygiene Peace and order</p>
<p>b) <u>Longer term needs</u> Home lots Farmlots Forest Areas Community facilities Foot trails and foot bridges Spring development Artesian wells Schools Public markets Government house Medical missions and services Education Special social services <u>Livelihood projects</u> Contract reforestation Rehabilitation of agricultural and aquacultural facilities Credit facilities Social technology training</p>	<p>Homelots Farmlots Paved roads with sidewalk Street lighting Drainage system Water system (Elevated steel tanks for water storage and piped distribution system) Elementary school High school Public market Commercial stalls Government building Hospital Clinic Town plaza Playgrounds Livelihood training centers Work shops Productivity centers with standard factory buildings</p>
<p>c) <u>Core shelter program</u> Housing cost P6,000 Construction schemes Cash loan Repayment Cash loan- free</p>	<p>P22,697.85 to P51,000 per unit Cash loan Self-help (bayanihan) Straight contract P10,000 grant P10,000 loan 25-year repayment 3-year grace</p>
<p>d) The Barangay Assimilation and Rehabilitation Program (BARP) Loan package : Loan terms : Loan purpose : Process :</p>	<p>from P5,000 to P35,000, of which P10,000 is a grant and the balance is a loan 25 years repayment, with 3 years grace period. house reconstruction land acquisition and house construction plus- initial livelihood capital DSWD validation PHIVOLCS opinion on present and future danger of lahar</p>

Table M.19 Total Number of Evacuees and Capacity of Evacuation Sites

Threatened Municipality	Total Evacuees (max.)	No. of Families (max.)	Capacity Evacuation Sites	Under (Over) Capacity
1. Angeles City	59,291	14,251	10,882	(3,369)
2. Arayat	24,720	4,458	n.d.	n.d.
3. Mabalacat	12,266	2,416	18,208	(2,839)
4. Magalang	19,094	3,261	800	(2,461)
5. Mexico	69,652	11,607	500	(11,107)
6. Sta. Ana	23,448	3,908	2,250	(1,658)
7. Bamban	34,864	6,081	11,444	5,363
8. Capas	23,596	4,617	9,600	4,983
9. Concepcion	71,890	11,384	14,022	2,638
Totals	338,821	61,983	67,706	(8,450)

Table M.20 Evacuation Sites by Philippine National Red Cross

Municipality	Location	No. of families
<u>Red Cross Villages</u>		
San Felipe	Sitio Latic, Barangay Sindol	112
Cabangan	Maligaya	145
San Marcelino	Vega	824
	Malangkit	182
Botolan	Etanglew	nd
	Bihaw	nd
Paluig	Bulawin	nd
<u>Tent Cities</u>		
San Fernando	Saguin	684
Magalang	Ayala	218
Palayan	Pinaltakan	
	Caballero	230
Bamban	Anupul	261
Concepcion		359
San Clemente	Dueg	172

Table M.21 Proposed Permanent Evacuation Sites

Angeles	Areas North of Abacan River	Pulung Maragul Sapa Ibutad Cutud Pulung Cacutud
	Areas South of Abacan River	Mining Pampang Sapang Ibutad Pulungbulu Aquino Pampang Cutcut Anunas
Arayat	Areas east of Pampanga River	Kaledian Plazang Luma Gatiwin Manga Cacutud Guemasan
Mabalacat	North of Bamban River	Dolores, Bamban
	South of Bamban and Sapang Balen Rivers	Mauaque Panalayunan Dapdap Camatchiles
Magalang	Sta. Rosa	Sta. Maria San Agustin Sto. Rosario
Mexico	North of Abacan River	Lacmit, Sta. Ana San Pablo, Sta. Ana Buonavista
	South of Abacan River	Panpuan Sabanilla Acli San Rafael
Sta. Ana	San Antonio	Lacmit Santiago San Bartolome
Bamban	North of Bamban River	Loures San Roque Anupul
	South of Bamban River	Dolores Mauaque
Capas	Sto. Rosario	Sto. Domingo Mariglo Aranguren
Concepcion	North of Bamban River	Dutong A-Matas Santiago Caluhuan
	South of Bamban River	San Nicolas Balas San Antonio San Isidro