

Monthly Water Resources Amount (P-PE) - (Baa)

Station: Baa

Latitude: 10° 32' S

Longitude: 122° 50' E

Altitude: 139 m

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1981													
1982	42	414	54	-125	-113	-62	-88	-102	-117	-148	-135	-7	-387
1983	210	259	178	37	-103	-82	-96	-113	-131	-91	-119	-59	-112
1984	543	364	163	-47	-118	-84	-100	-112	-142	-171	-160	94	229
1985	22	385	163	-86	-138	-65	-105	-114	-116	-158	-139	21	-329
1986	633	484	250	-45	-69	-57	-51	-92	-123	-155	-185	-91	498
1987	539	68	-107	-82	-128	-91	-51	-110	-136	-159	-121	3	-375
1988	37	190	128	-138	-152	-111	-116	-114	-143	-194	117	323	-174
1989	147	125	370	31	-118	-76	-107	-122	-132	-176	-200	-89	-346
1990													
1991	114	268	-106	8	-133	-120	-78	-114	-125	-164	-23	-9	-484
1992	228	342	-32	-64	-123	-122	-119	-124	-100	-135	-97	151	-196
1993	553	43	107	-69	-90	-85	-106	-110	-136	-147	-80	102	-17
1994													
Average	298	261	116	-49	-109	-91	-90	-112	-127	-155	-116	43	-131

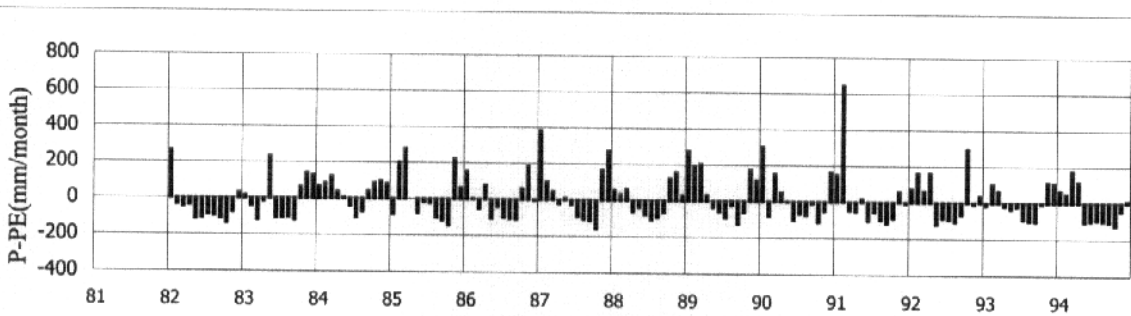


Figure Variation of Monthly Water Resources Amount (P-PE) - (Baa)

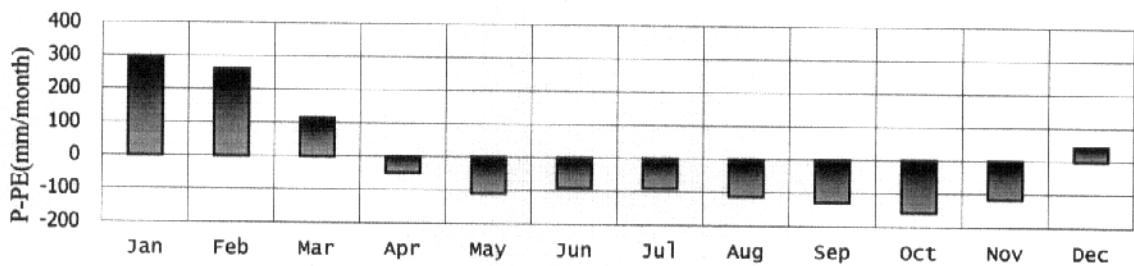


Figure Change of Monthly Average Water Resources Amount (P-PE) - (Baa)

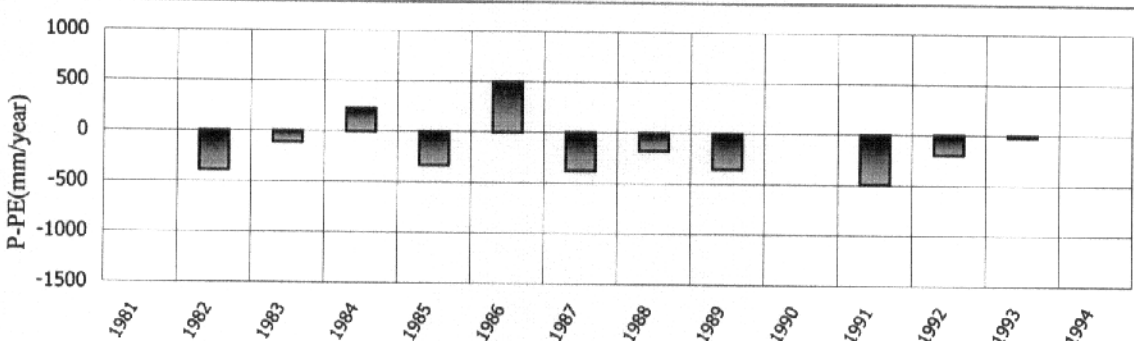


Figure Variation of Annual Water Resources Amount (P-PE) - (Baa)

Monthly Water Resources Amount (P-PE) - (Kupang)

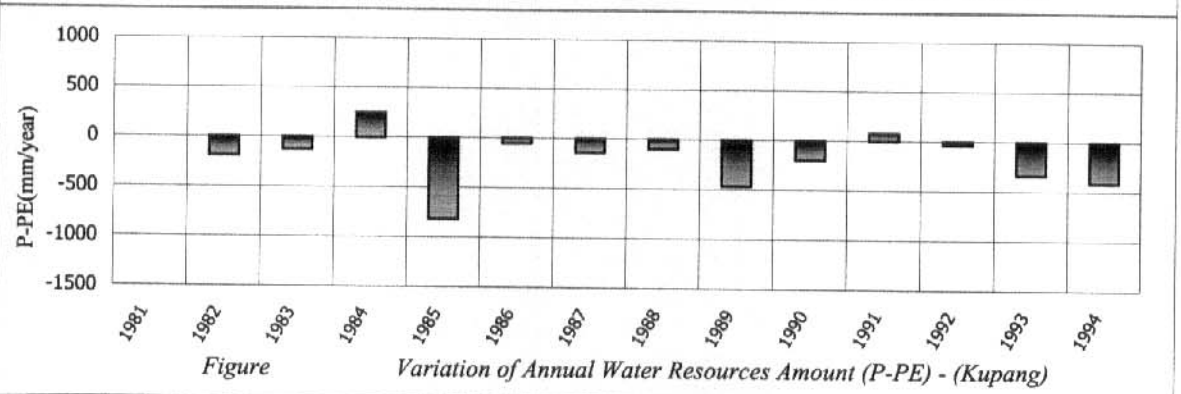
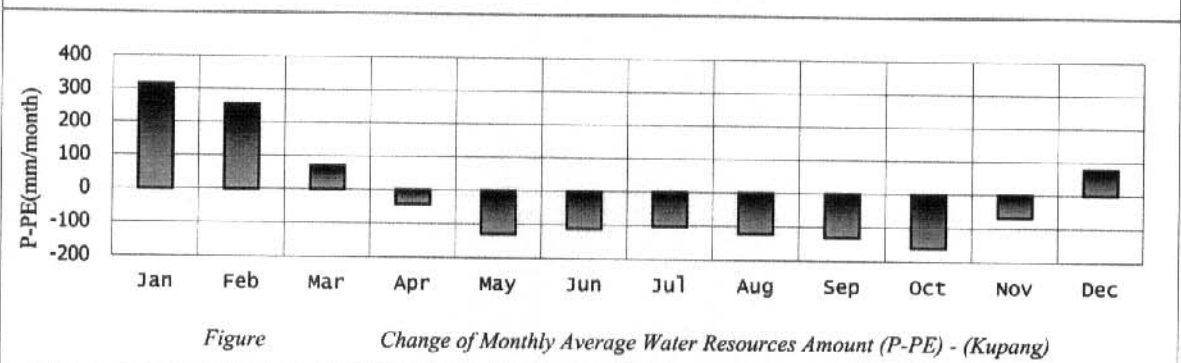
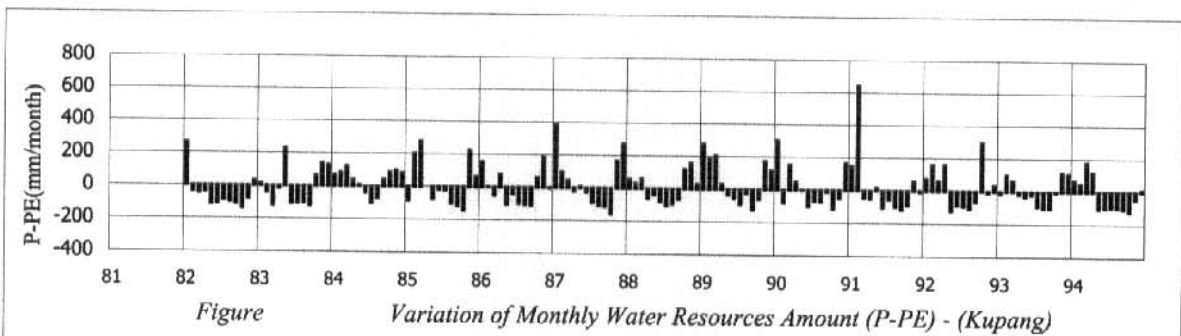
Station: Kupang

Latitude: 10° 11' S

Longitude: 123° 34' E

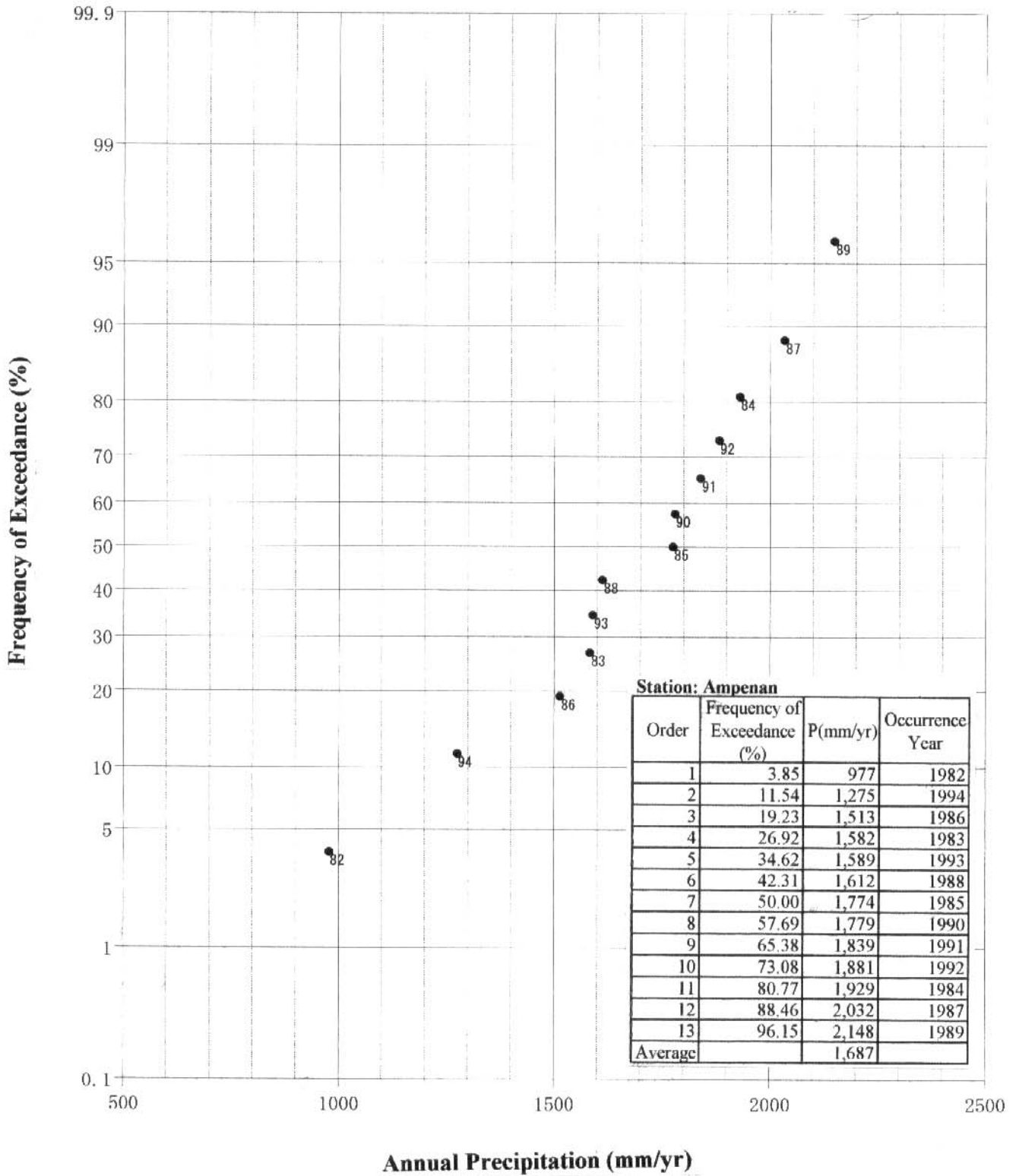
Altitude: 102 m

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1981													
1982	298	333	83	-105	-128	-109	-86	-112	-114	-145	-88	-15	-190
1983	254	288	91	39	-82	-117	-101	-119	-140	-120	-63	-54	-124
1984	464	365	123	-126	-134	-116	-104	-120	-116	-132	-125	268	246
1985	45	57	-19	-88	-148	-105	-93	-123	-133	-146	-60	-1	-814
1986	530	185	0	-94	-129	-76	-31	-113	-133	-159	-109	78	-51
1987	546	260	-94	-128	-117	-129	-111	-116	-136	-169	-72	130	-136
1988	264	182	142	-125	-152	-121	-124	-141	-150	-189	175	144	-95
1989	135	30	316	-51	-123	-110	-103	-122	-137	-177	-166	46	-462
1990	264	213	142	-24	-130	-113	-120	-116	-140	-171	-134	135	-195
1991	358	374	-83	293	-141	-118	-111	-123	-129	-162	19	-100	77
1992	177	575	73	4	-124	-121	-125	-118	-131	-158	-87	-1	-36
1993	552	147	50	-121	-144	-91	-110	-120	-136	-163	-182	-19	-337
1994	105	261	46	73	-131	-118	-95	-112	-112	-158	-140	-29	-411
Average	315	256	71	-42	-127	-110	-101	-120	-129	-158	-66	78	-133

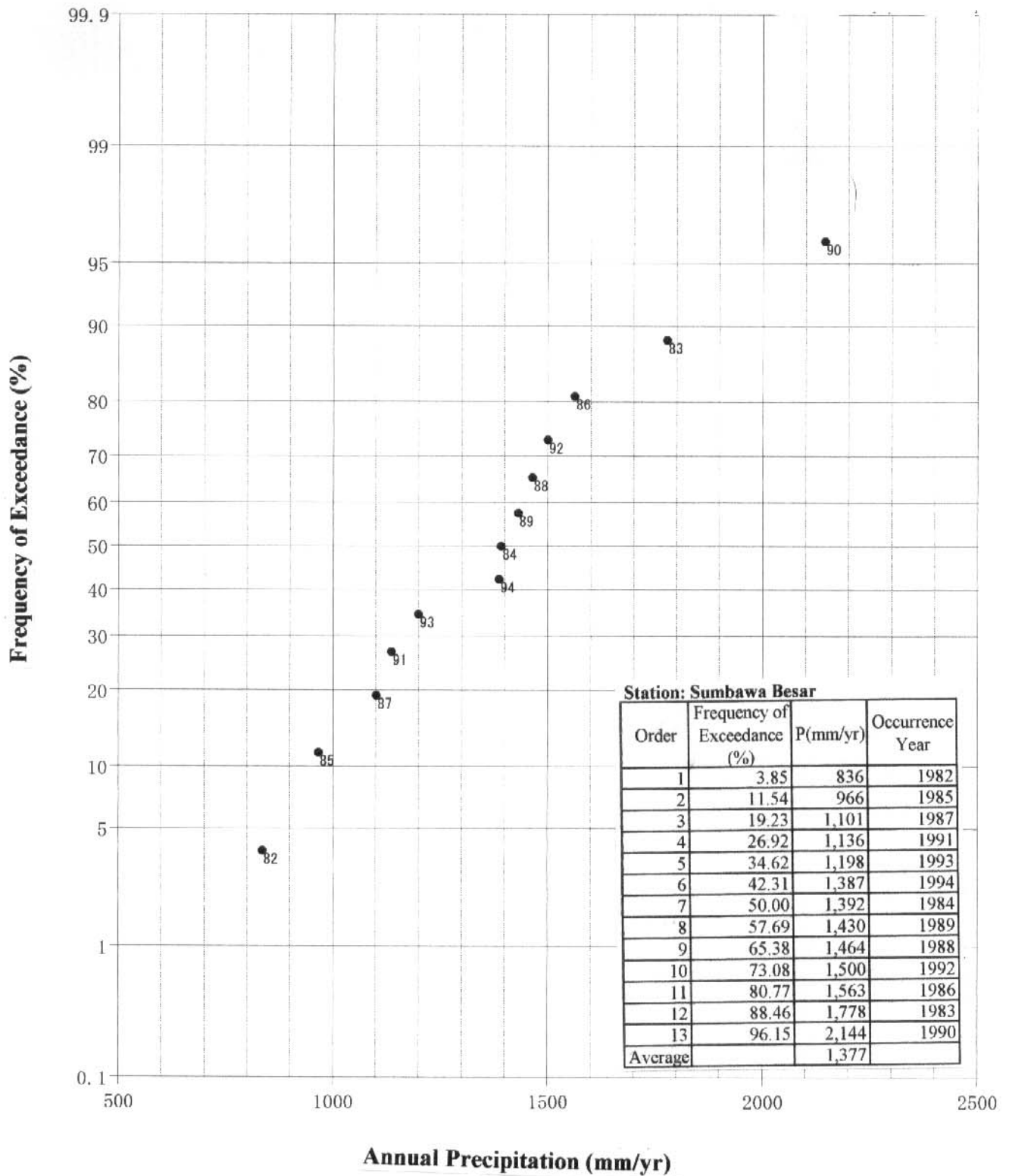


Mainly Hydrological Standard Year

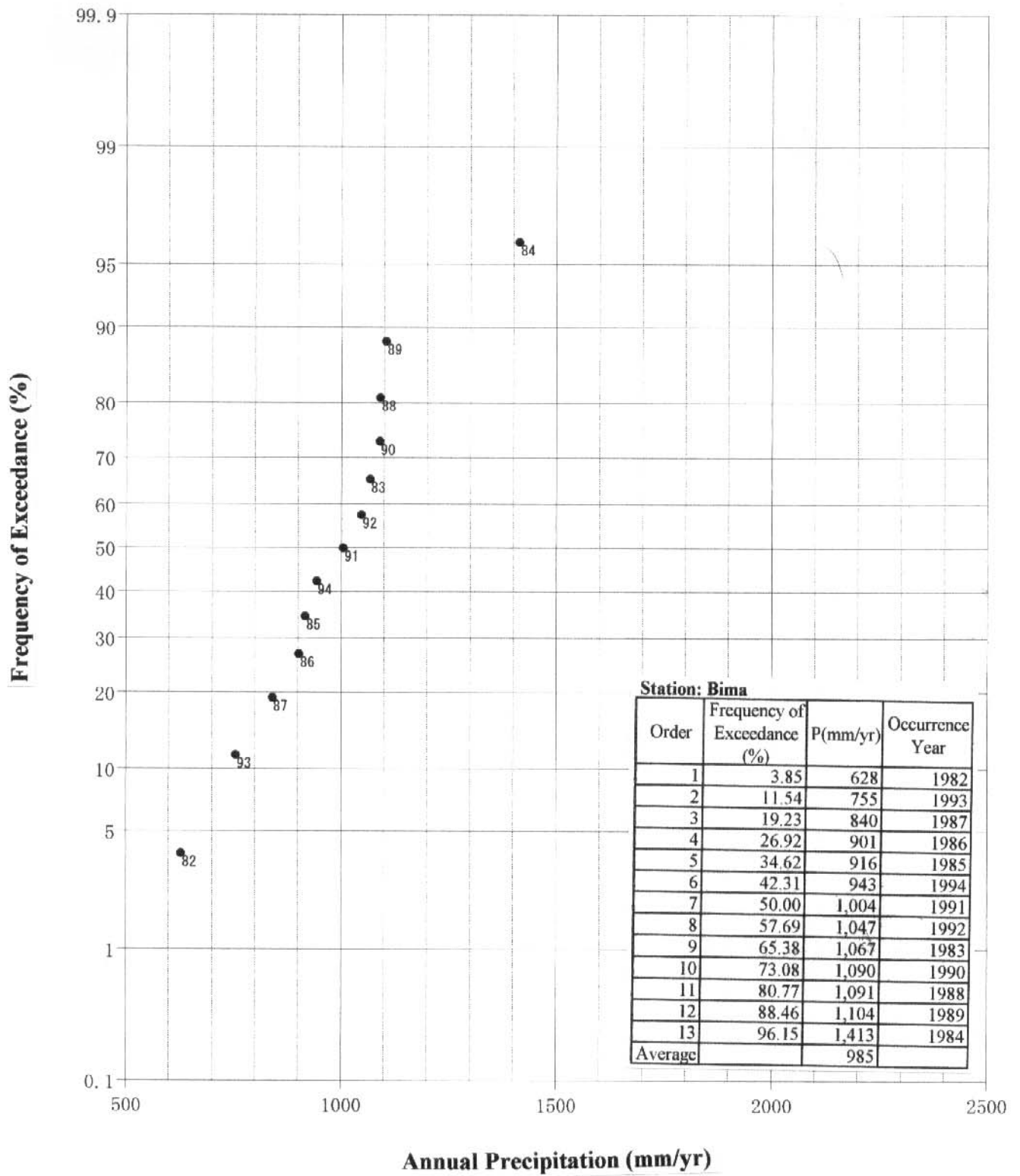
Station	Ordinary Year		1/10 Drought Year		Average Annual Precipitation
	Precipitation (mm/yr)	Occurrence Year	Precipitation (mm/yr)	Occurrence Year	
Ampenan	1,779	1990	1,275	1994	1,687
Sumbawa Besar	1,392	1984	966	1985	1,377
Bima	1,004	1991	755	1993	985
Maumere	925	1989	715	1994	980
Larantuka	1,208	1986	975	1985	1,202
Waingapu	839	1985	586	1987	801
Baa	1,523	1992	1,195	1991	1,563
Kupang	1,592	1983	1,227	1994	1,581



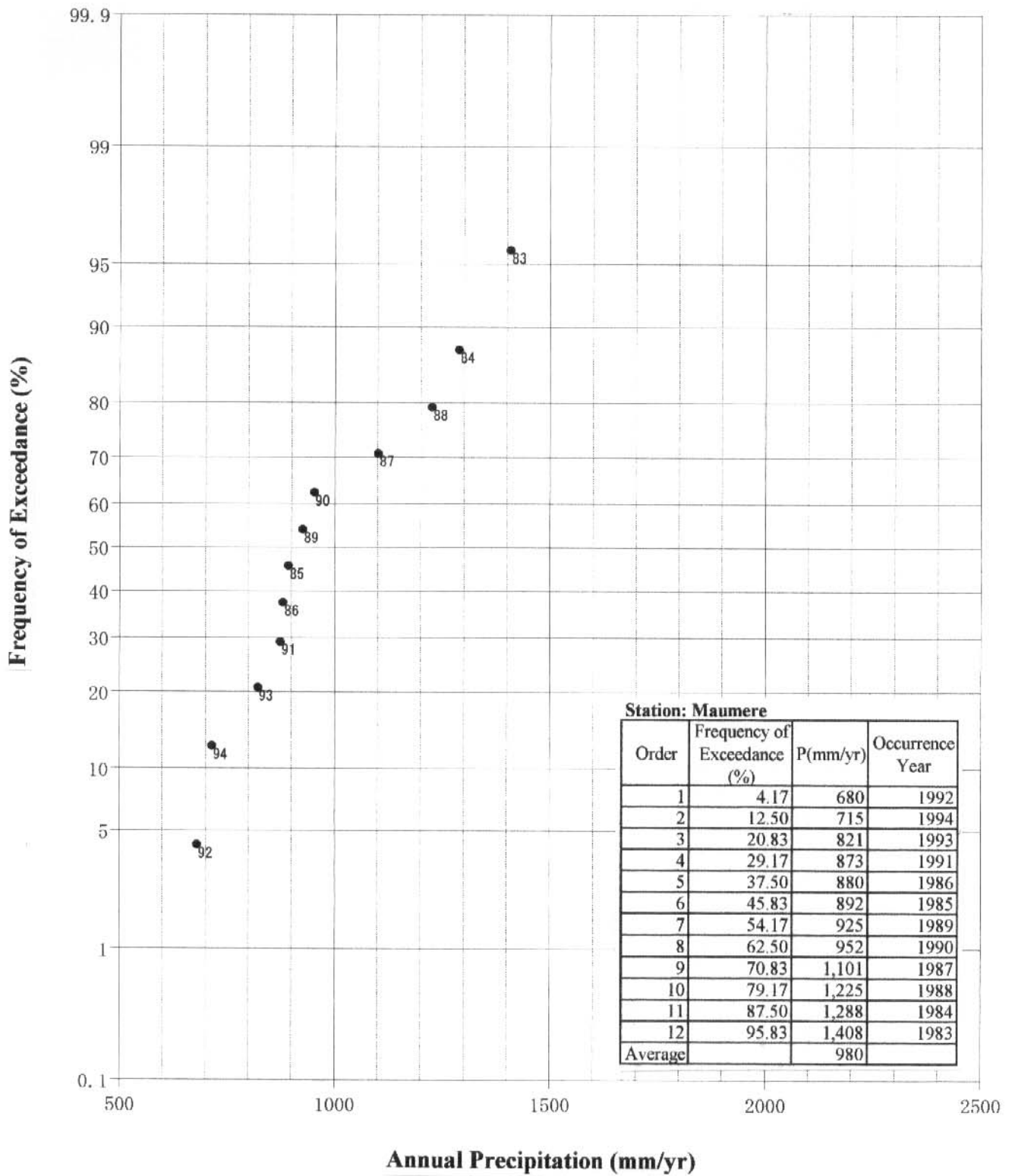
Annual Precipitation Versus Frequency of Exceedance - (Ampenan)



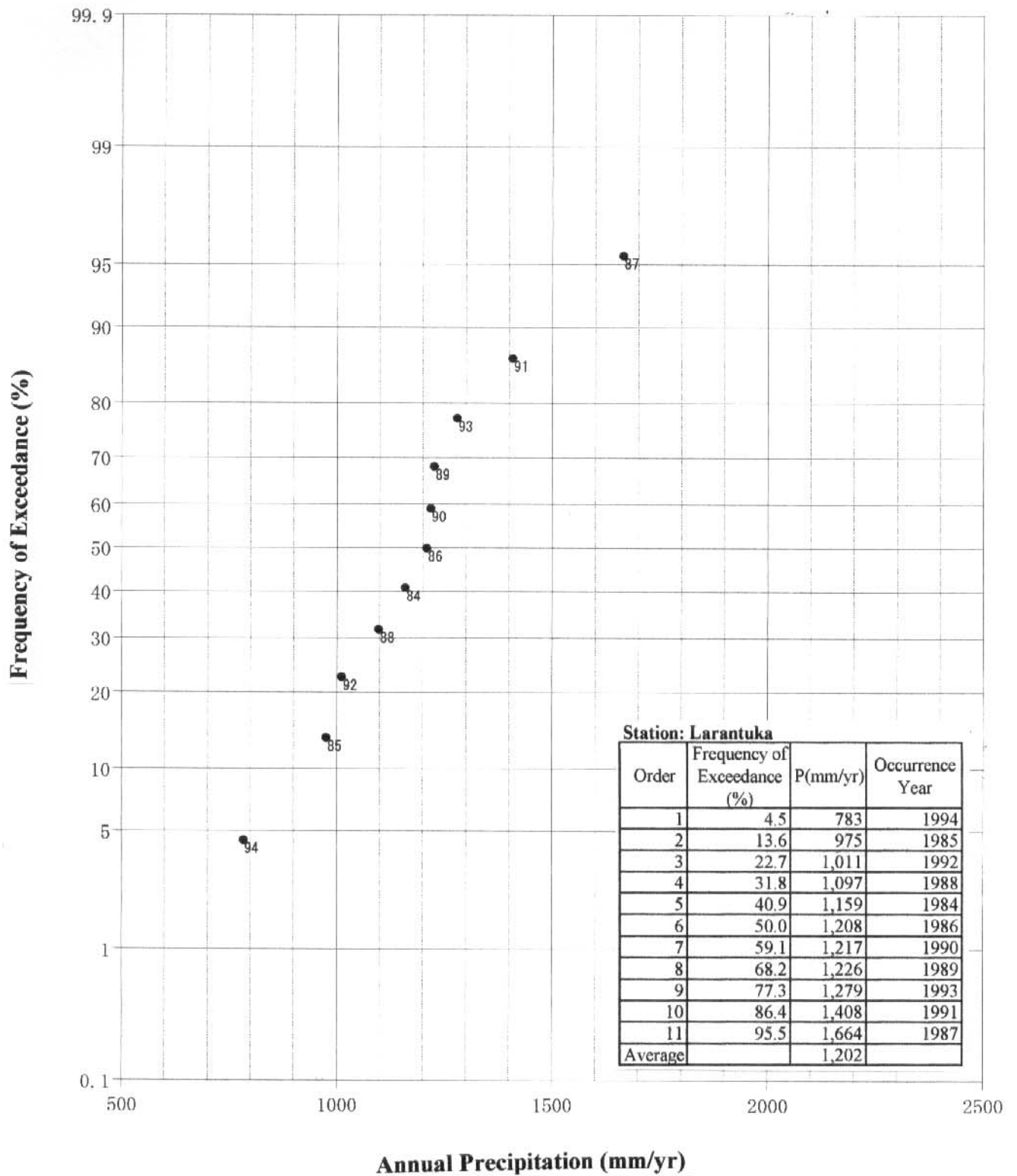
Annual Precipitation Versus Frequency of Exceedance - (Sumbawa Besar)



Annual Precipitation Versus Frequency of Exceedance - (Bima)

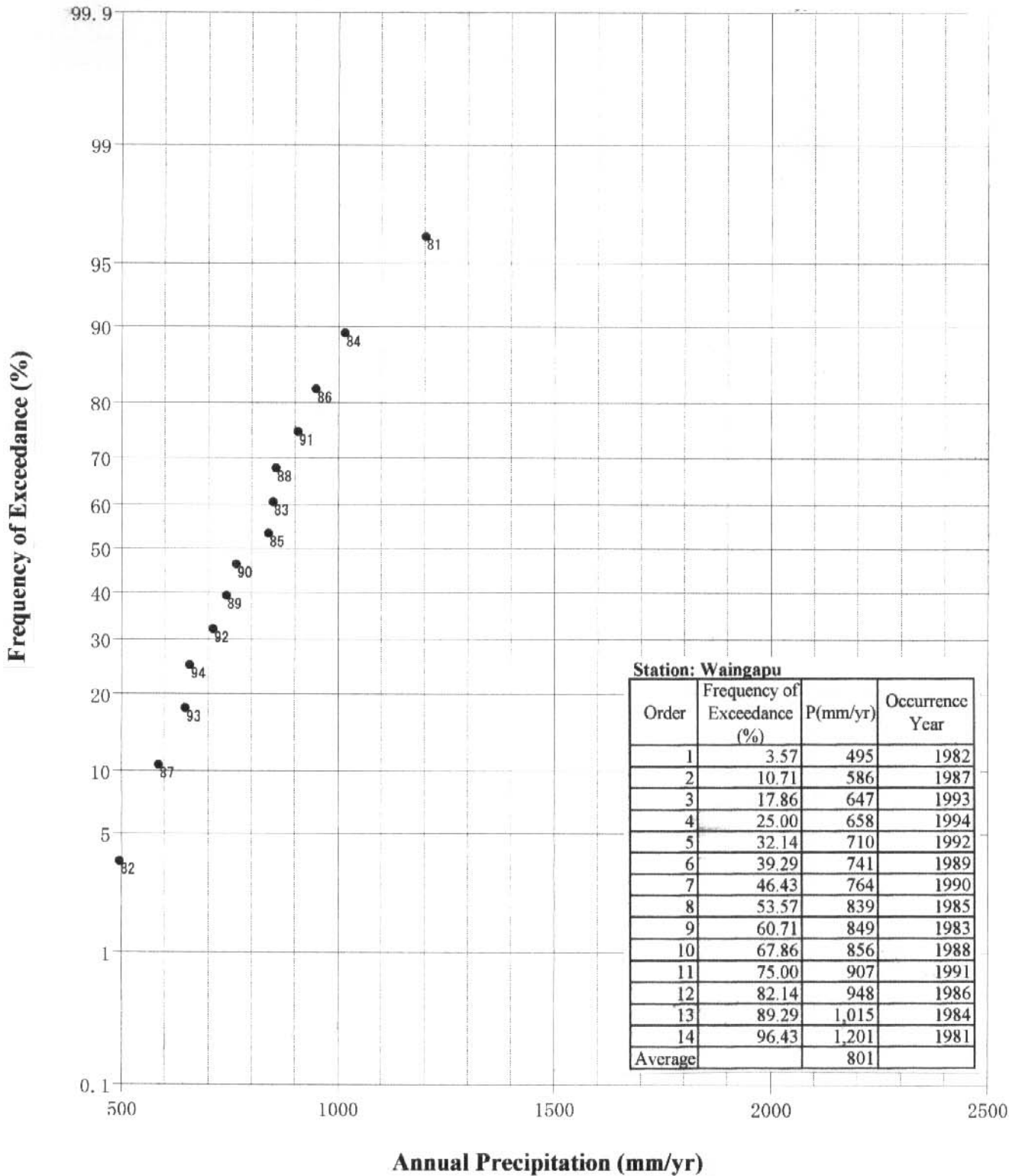


Annual Precipitation Versus Frequency of Exceedance - (Maumere)

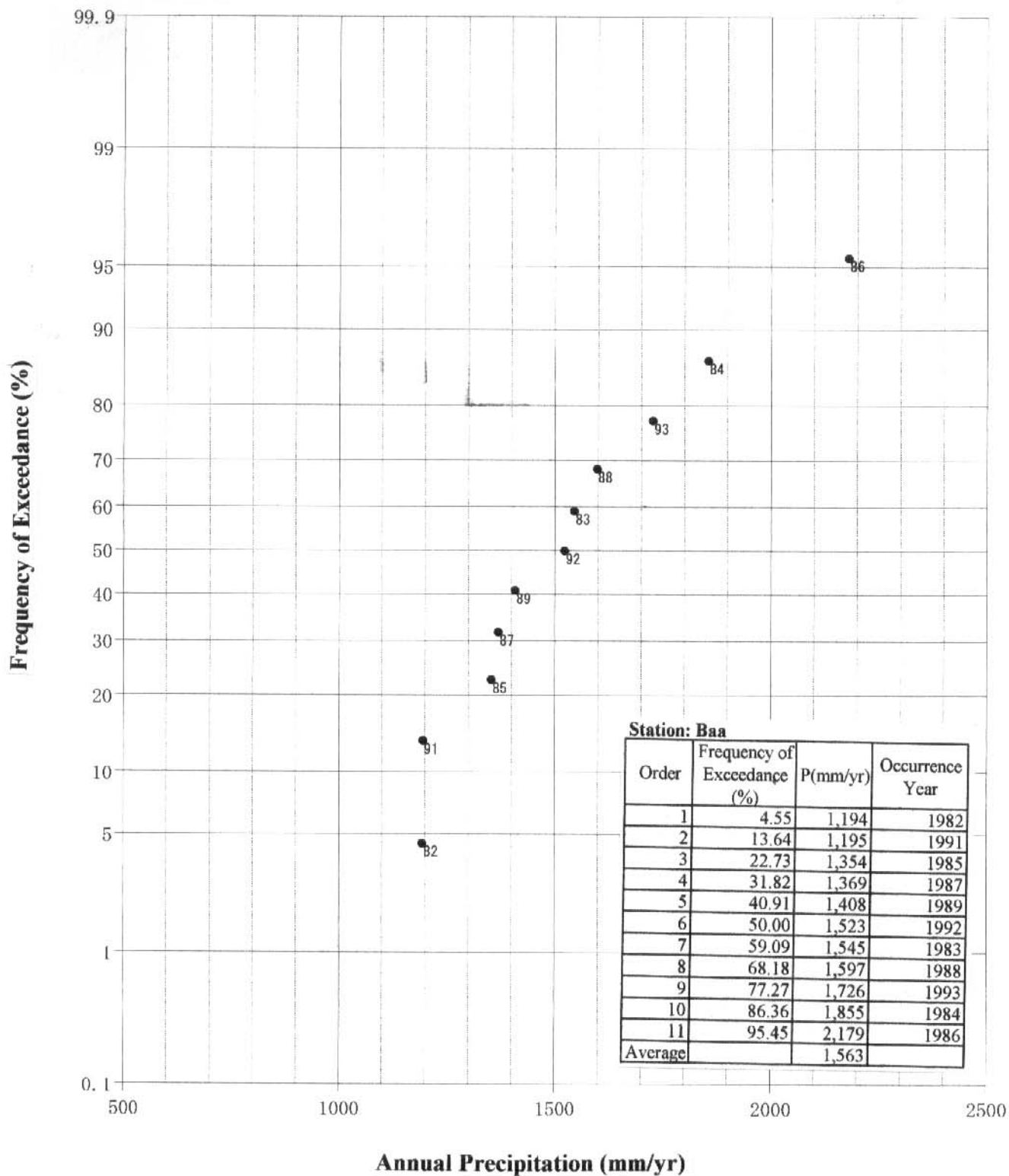


Annual Precipitation Versus Frequency of Exceedance - (Larantuka)

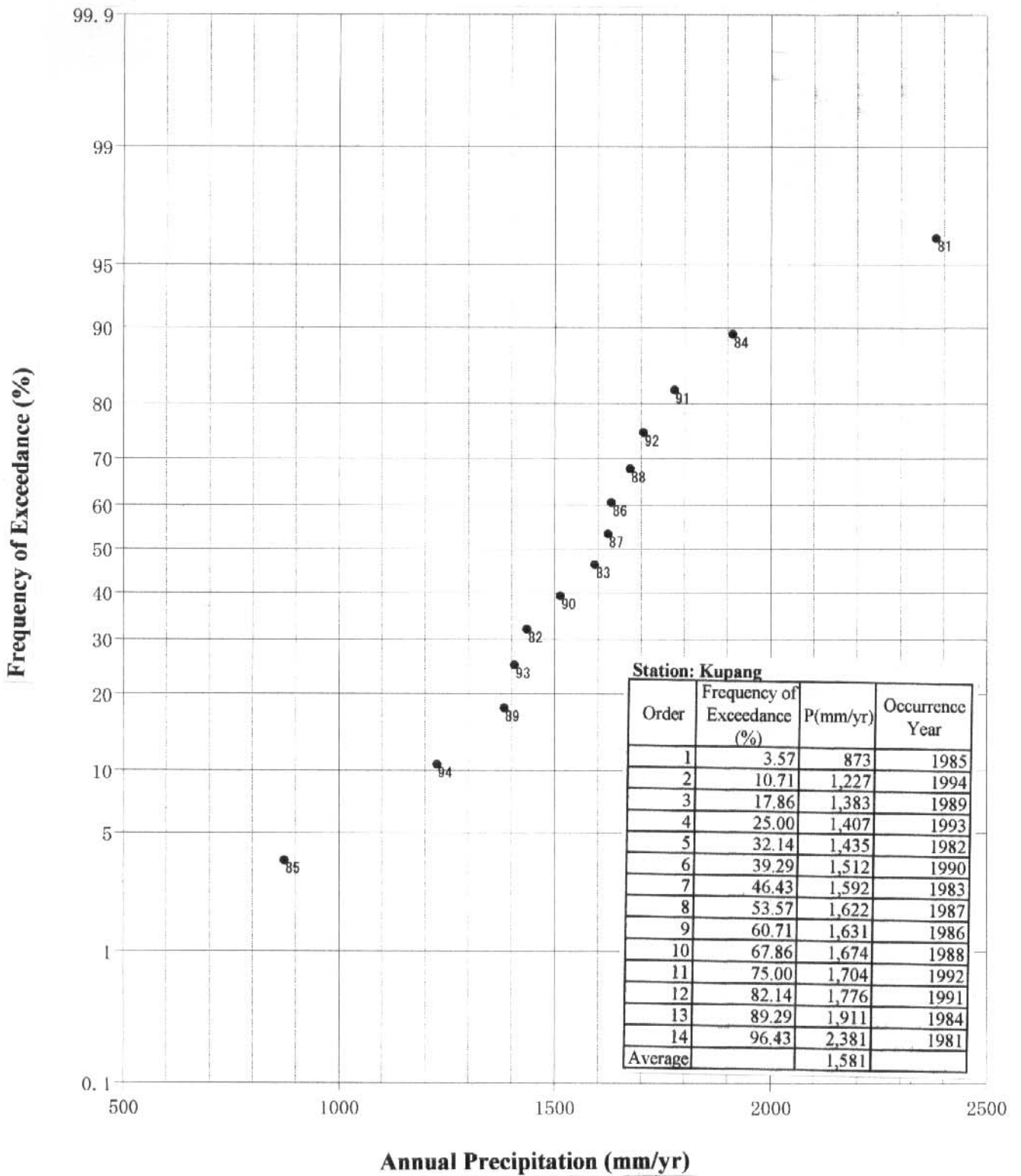
Appendix 2. 41 Annual Precipitation Versus Frequency of Exceedance - (Larantuka)



Annual Precipitation Versus Frequency of Exceedance - (Waingapu)



Annual Precipitation Versus Frequency of Exceedance - (Baa)



Annual Precipitation Versus Frequency of Exceedance - (Kupang)

Appendix 2. 44 Annual Precipitation Versus Frequency of Exceedance - (Kupang)

Appendix 3

LIST OF EXISTING WELLS AND SPRINGS

Appendix 3
LIST OF EXISTING WELLS AND SPRINGS

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List of Existing Wells - NTB (1)

No.	Name	Location						Type of Well	Well Structure				Water Quality			Groundwater Use			Problems with Water Source	Remarks
		Village	Sub-District	District	Lat. (°)	Long. (°)	Alt. (m)		Dep. (m)	Dia. (mm)	GWL (m)	Casing Mat.	WT (°C)	pH	EC (mS/m)	Domestic No. of Per	Irrigation Area(ha)	Crops		
BD 1-1	Kasirin	Kuranji	Labuapi	Lombok Barat	08° 38, 054'	116° 04, 961'	5	D	2.40	800	0.85	Concrete	29.9	6.61	76.7	30	None	None	Reducing GWL	
BD 1-2	Saparuddin	Kuranji	Labuapi	Lombok Barat	08° 37, 365'	116° 04, 703'	5	D	2.65	800	1.30	Concrete	29.2	6.79	49.4	25	None	None	Reducing GWL	
BD 1-3	Masuhur	Kuranji	Labuapi	Lombok Barat	08° 37, 509'	116° 05, 020'	5	D	2.40	800	1.25	Concrete	30.3	6.66	44.7	75	None	None	Reducing GWL	
BD 2-1	K. Desa	Bajur	Labuapi	Lombok Barat	08° 37, 231'	116° 06, 454'	15	D	2.42	800	1.24	Concrete	28.1	7.03	45.8	2	None	None	Reducing GWL	
BD 2-2	Urah	Bajur	Labuapi	Lombok Barat	08° 37, 271'	116° 06, 439'	15	D	-	800	-	Brick	29.6	7.13	71.5	20	None	None	Reducing GWL	
BB 2-3	Amisah	Bajur	Labuapi	Lombok Barat	08° 37, 546'	116° 05, 839'	10	HB	12.00	50	-	Galv. Steel	29.2	7.29	38.6	50	None	None	Nonexistent	
BD 2-4	Sumirah	Bajur	Labuapi	Lombok Barat	08° 37, 228'	116° 06, 118'	10	D	1.80	800	0.55	Concrete	30.5	6.87	34.9	60	None	None	Reducing GWL	
BD 2-5	Sudirman	Bajur	Labuapi	Lombok Barat	08° 37, 046'	116° 06, 623'	15	D	2.60	1100	1.25	Brick	30.5	7.00	83.2	30	None	None	Reducing GWL	
BD 3-1	Masjid	Sembung	Narmada	Lombok Barat	08° 36, 801'	116° 09, 673'	45	D	3.40	800	2.80	Concrete	29.6	6.64	15.5	100	None	None	Reducing GWL	
BD 3-2	Ilam	Sembung	Narmada	Lombok Barat	08° 36, 717'	116° 09, 811'	50	D	3.25	1000	2.20	Brick	28.6	6.75	13.8	100	None	None	Reducing GWL	
BD 3-3	-	Sembung	Narmada	Lombok Barat	08° 36, 709'	116° 09, 973'	55	D	4.70	800	2.60	Concrete	28.9	6.56	25.3	100	None	None	Reducing GWL	
BD 4-1	Kades	Duman	Narmada	Lombok Barat	08° 33, 855'	116° 08, 956'	55	D	8.90	800	7.45	Concrete	29.2	6.57	49.9	40	None	None	Reducing GWL	
BD 4-2	Usmajaya	Duman	Narmada	Lombok Barat	08° 33, 804'	116° 08, 945'	55	D	4.25	700	3.95	Concrete	29.2	6.96	24.3	25	None	None	Reducing GWL	
BD 5-1	Sahibun	Peresak	Narmada	Lombok Barat	08° 35, 482'	116° 13, 411'	150	D	8.20	750	7.30	-	27.4	6.64	26.2	10	None	None	Reducing GWL	
BD 5-2	Sahnun	Peresak	Narmada	Lombok Barat	08° 35, 206'	116° 13, 616'	170	D	9.55	750	7.95	-	27.7	6.55	38.2	10	None	None	Reducing GWL	
BD 6-1	K. Desa	Jelantik	Jonggat	Lombok Tengah	08° 40, 177'	116° 13, 258'	100	D	6.60	1000	0.80	Brick	28.0	6.86	59.2	30	None	None	Reducing GWL	
BD 6-2	Ridwan	Jelantik	Jonggat	Lombok Tengah	08° 40, 258'	116° 13, 319'	105	D	4.55	1000	2.15	Rock	28.7	7.31	82.6	150	None	None	Reducing GWL	
BD 6-3	Buntutul	Jelantik	Jonggat	Lombok Tengah	08° 40, 136'	116° 13, 057'	100	D	3.65	1000	1.00	Rock	28.7	6.58	53.8	1000	None	None	Reducing GWL	
BB 6-4	Lalu Suparsih	Jelantik	Jonggat	Lombok Tengah	08° 39, 734'	116° 12, 701'	95	B	45.00	150	0.85	PVC	28.7	6.81	36.4	75	None	None	Nonexistent	
BD 6-5	Sudiman	Jelantik	Jonggat	Lombok Tengah	08° 39, 634'	116° 12, 530'	90	D	5.80	700	3.67	Rock	28.1	6.95	183.5	75	None	None	Reducing GWL	
BD 7-1	Sarkawi	Labulia	Jonggat	Lombok Tengah	08° 40, 921'	116° 11, 095'	55	D	4.35	750	1.30	Concrete	28.9	6.96	102.7	300	None	None	Drying up	
BD 7-2	Lalu Arpa	Labulia	Jonggat	Lombok Tengah	08° 40, 884'	116° 10, 772'	50	D	5.07	750	1.45	Brick	29.3	6.96	99.5	125	None	None	Drying up	
BD 7-3	Lalu Sabodin	Labulia	Jonggat	Lombok Tengah	08° 40, 751'	116° 10, 492'	40	D	3.40	1100	1.40	Brick	28.4	7.27	112.1	100	None	None	Drying up	
BD 7-4	Masjid	Labulia	Jonggat	Lombok Tengah	08° 40, 499'	116° 10, 210'	35	D	11.15	800	8.85	Concrete	29.3	6.74	38.0	100	None	None	Drying up	

Note : BD: NTB-Dug Well, BB: NTB-Tube Well, D: Dug Well, HB: Hand Tube Well, B: Tube Well, GWL: Groundwater level

List of Existing Wells - NTB (2)

No.	Name	Location						Type of Well	Well Structure				Water Quality			Groundwater Use			Problems with Water	Remarks
		Village	Sub-District	District	Lat. (°)	Long. (°)	Alt. (m)		Dep. (m)	Dia. (mm)	GWL (m)	Casing Mat.	WT (°C)	pH	EC (mS/m)	Irrigation				
																No. of Per	Area(ha)	Crops		
BD 8-1	Amamiji	Setanggor	Praya Barat	Lombok Tengah	08°45, 394'	116° 13, 371'	85	D	2.75	850	0.00	Rock	27.2	7.05	50.6	1200	None	None	Reducing GWL	
BD 8-2	H. Abdul Kahar	Setanggor	Praya Barat	Lombok Tengah	08°45, 440'	116° 13, 521'	80	D	2.30	1400	0.00	Rock	26.9	7.52	48.7	1350	None	None	Reducing GWL	
BD 8-3	H. Syarifudin	Setanggor	Praya Barat	Lombok Tengah	08°45, 587'	116° 13, 022'	80	D	3.55	900	0.80	Rock	26.6	7.25	116.9	900	None	None	Reducing GWL	
BD 8-4	Genam	Setanggor	Praya Barat	Lombok Tengah	08°45, 764'	116° 12, 733'	85	D	5.45	950	4.05	-	26.7	7.49	115.3	450	None	None	Reducing GWL	
BD 8-5	Ma'lukma	Setanggor	Praya Barat	Lombok Tengah	08°46, 266'	116° 13, 026'	65	D	12.25	850	7.95	-	27.5	7.04	94.4	450	None	None	Reducing GWL	
BD 9-1	Desa Rembitan	Rembitan	Pujut	Lombok Tengah	08°49, 966'	116° 17, 675'	120	D	10.75	2400	3.70	Brick	27.9	7.10	155.6	500	None	None	Drying Up	
BD 9-2	-	Rembitan	Pujut	Lombok Tengah	08°49, 761'	116° 17, 782'	110	D	12.10	1900	2.60	Concrete	27.3	6.97	113.8	500	None	None	Drying Up	
BD 9-3	Karangbat	Rembitan	Pujut	Lombok Tengah	08°49, 705'	116° 17, 546'	120	D	10.95	2800	4.25	Brick	30.2	7.04	185.7	300	None	None	Reducing GWL	
BD 9-4	-	Rembitan	Pujut	Lombok Tengah	08°50, 353'	116° 17, 513'	130	D	9.00	1550	5.60	Brick	29.1	7.08	195.0	300	None	None	Reducing GWL	
BD 10-1	Kp. Desa	Bagik Papan	Pringgabaya	Lombok Timur	08°34, 009'	116° 35, 170'	120	D	21.40	800	13.50	Concrete	26.6	7.13	36.2	50	None	None	Reducing GWL	
BD 10-2	Ima Anam	Bagik Papan	Pringgabaya	Lombok Timur	08°34, 181'	116° 35, 131'	110	D	13.65	900	11.30	Brick	26.3	6.95	30.3	60	None	None	Drying Up	
BD 10-3	H. Mashuri	Bagik Papan	Pringgabaya	Lombok Timur	08°34, 324'	116° 35, 763'	90	D	10.00	900	9.45	Brick	27.4	6.82	38.4	150	None	None	Drying Up	
BD 12-1	Muhurudin	Batunampar	Kruwu	Lombok Timur	08°51, 247'	116° 24, 309'	3	D	2.85	800	2.75	Concrete	28.3	7.50	138.9	700	None	None	Drying Up	
BD 12-2	Amasaerani	Batunampar	Kruwu	Lombok Timur	08°50, 881'	116° 24, 116'	15	D	8.65	750	2.65	Brick	29.7	7.10	108.0	600	None	None	Reducing GWL	
BD 12-3	Ibnu Halit	Batunampar	Kruwu	Lombok Timur	08°49, 813'	116° 24, 080'	15	D	3.45	1000	2.50	Rock	28.9	7.32	371.0	300	None	None	Drying Up	
BD 12-4	Majerun	Batunampar	Kruwu	Lombok Timur	08°49, 750'	116° 24, 114'	15	D	3.05	1500	1.62	Rock	29.7	7.56	185.0	400	None	None	Drying Up	
BD 12-5	Kamarudin	Batunampar	Kruwu	Lombok Timur	08°49, 647'	116° 24, 429'	15	D	5.10	950	2.63	Brick	29.5	7.37	431.0	300	None	None	Drying Up	
BB 13-1	H. Abdullah	Lb. Mapin	Alas Barat	Sumbawa	08°31, 215'	116° 57, 429'	5	B	80.00	100	0.00	PVC	32.3	7.65	46.3	10	20	Paddy	Nonexistent	Artesian W. (0.2 l/sec)
BD 13-2	Kaharudin	Lb. Mapin	Alas Barat	Sumbawa	08°31, 333'	116° 56, 358'	5	D	4.20	700	2.50	Brick	30.2	7.24	75.4	20	None	None	Reducing GWL	
BD 13-3	H. Raub	Lb. Mapin	Alas Barat	Sumbawa	08°30, 972'	116° 56, 289'	3	D	2.10	600	0.65	Concrete	32.4	8.17	249.0	50	None	None	Reducing GWL	
BD 13-4	M. Kasim HL.	Lb. Mapin	Alas Barat	Sumbawa	08°31, 523'	116° 55, 772'	5	D	4.50	800	3.05	Concrete	29.5	7.33	128.0	20	None	None	Reducing GWL	
BD 14-1	Nunok	Lb. Lalar	Taliwang	Sumbawa	08°48, 939'	116° 49, 356'	3	D	3.30	1100	1.80	Concrete	29.2	7.31	39.9	2500	None	None	Reducing GWL	
BD 14-2	-	Lb. Lalar	Taliwang	Sumbawa	08°48, 728'	116° 49, 085'	5	D	4.20	1300	2.30	Concrete	29.2	7.56	68.2	1500	None	None	Reducing GWL	
BD 14-3	K. Desa	Lb. Lalar	Taliwang	Sumbawa	08°48, 897'	116° 48, 968'	3	D	2.55	600	2.05	Concrete	29.2	7.94	38.5	10	None	None	Reducing GWL	
BD 14-4	H. Ibrahim	Lb. Lalar	Taliwang	Sumbawa	08°49, 353'	116° 50, 161'	10	D	2.50	900	0.85	Concrete	30.2	7.23	43.5	400	None	None	Reducing GWL	
BD 14-5	Daud	Lb. Lalar	Taliwang	Sumbawa	08°49, 419'	116° 49, 880'	10	D	2.40	700	1.55	Concrete	28.1	7.13	47.7	250	None	None	Reducing GWL	

Note : BD: NTB-Dug Well, BB: NTB-Tube Well, D: Dug Well, HB: Hand Tube Well, B: Tube Well, GWL: Groundwater level

List of Existing Wells - NTB (3)

No.	Name	Location						Type of Well	Well Structure				Water Quality			Groundwater Use			Problems with Water	Remarks
		Village	Sub-District	District	Lat. (°)	Long. (°)	Alt. (m)		Dep. (m)	Dia. (mm)	GWL (m)	Casing Mat.	WT (°C)	pH	EC (mS/m)	Domestic	Irrigation			
																No. of Per	Area(ha)	Crops		
BD 15-1	Asam	Poto	Moyo Hilir	Sumbawa	08° 29, 903'	117° 28, 642'	20	D	5.65	1100	3.30	Brick	28.0	6.81	61.4	200	None	None	Drying Up	
BD 15-2	Asaw Jaho	Poto	Moyo Hilir	Sumbawa	08° 30, 455'	117° 28, 744'	20	D	3.60	800	1.40	Concrete	30.4	7.50	107.1	140	None	None	Reducing GWL	
BD 15-3	Sanola Jakir	Poto	Moyo Hilir	Sumbawa	08° 30, 754'	117° 28, 898'	20	D	6.45	900	4.70	Concrete	28.9	7.12	139.3	250	None	None	Drying Up	
BB 15-4	SPS 112	Poto	Moyo Hilir	Sumbawa	08° 28, 885'	117° 28, 424'	20	B	62.00	-	-	Galv. Steel	30.2	6.62	108.0		30	Paddy	Nonexistent	
BB 16-1	UPT Piong	Piong	Sanggar	Bima	08° 20, 476'	118° 14, 550'	20	B	82.00	250	-	PVC	32.4	7.22	229.0	25	11	Vegetables	Saline	
BD 16-2	M. Yamin	Piong	Sanggar	Bima	08° 21, 420'	118° 15, 249'	10	D	5.75	800	5.55	-	29.2	7.18	54.2	150	None	None	Reducing GWL	
BD 16-3	Aidin Amanan	Piong	Sanggar	Bima	08° 21, 550'	118° 15, 169'	20	D	5.75	900	5.15	-	30.2	7.23	25.4	40	None	None	Reducing GWL	
BD 16-4	Ismail	Piong	Sanggar	Bima	08° 21, 375'	118° 15, 263'	10	D	6.20	550	5.80	Concrete	30.2	7.17	26.9	100	None	None	Reducing GWL	
BD 17-1	Abubakar	Lb. Kenanga	Tambora	Bima	08° 08, 382'	117° 46, 286'	5	D	3.45	800	3.00	Concrete	29.2	6.91	32.3	20	None	None	Nonexistent	
BD 17-2	Syarifudin Jafar	Lb. Kenanga	Tambora	Bima	08° 08, 387'	117° 46, 351'	5	D	4.35	600	3.75	Brick	29.2	6.69	19.3	30	None	None	Nonexistent	
BD 17-3	Rahman Ahmad	Lb. Kenanga	Tambora	Bima	08° 08, 366'	117° 46, 172'	3	D	1.95	900	1.55	Concrete	27.0	7.58	77.1	20	None	None	Nonexistent	
BD 17-4	Sahbudin Arsyad	Lb. Kenanga	Tambora	Bima	08° 08, 358'	117° 46, 224'	4	D	1.55	800	1.00	Concrete	30.2	7.05	23.7	30	None	None	Nonexistent	
BD 18-1	Masjid	Kawuwu	Langgudu	Bima	08° 37, 903'	118° 46, 433'	80	D	4.25	1060	3.30	Rock	29.2	6.94	33.6	50	None	None	Drying Up	
BB 19-1	SP2L	Ranggo	Huu	Dompu	08° 36, 395'	118° 29, 428'	50	B	60.00	250	2.00	PVC	29.2	6.83	27.7	5000	None	None	Nonexistent	
BD 19-2	Abdullah Taher	Ranggo	Huu	Dompu	08° 36, 410'	118° 29, 436'	50	D	5.85	800	1.40	Brick	28.1	6.77	118.8	20	None	None	Reducing GWL	
BD 19-3	Ahman Sukma	Ranggo	Huu	Dompu	08° 36, 574'	118° 29, 393'	50	D	8.10	1000	3.00	Brick	28.1	6.66	38.1	300	None	None	Reducing GWL	
BD 19-4	Salegondah	Ranggo	Huu	Dompu	08° 36, 682'	118° 29, 417'	50	D	8.70	900	3.00	Concrete	30.2	6.56	115.3	250	None	None	Reducing GWL	
BD 20-1	Masjid	Jambu	Pajo	Dompu	08° 38, 989'	118° 25, 881'	3	D	3.00	900	1.40	-	30.2	7.20	136.6	50	None	None	Saline & Red. GWL	
BD 20-2	-	Jambu	Pajo	Dompu	08° 38, 049'	118° 25, 357'	5	D	3.00	850	0.75	Concrete	30.2	7.23	112.2	150	None	None	Reducing GWL	
BD 20-3	H. Husein	Jambu	Pajo	Dompu	08° 38, 897'	118° 27, 068'	8	D	4.80	900	3.40	Concrete	29.2	6.93	27.9	250	None	None	Reducing GWL	
BD 20-4	M. Said S.	Jambu	Pajo	Dompu	08° 38, 980'	118° 26, 828'	5	D	4.30	900	1.45	Concrete	30.2	7.00	74.5	125	None	None	Reducing GWL	
BB 20-5	-	Cempu Jaya	Huu	Dompu	08° 42, 267'	118° 25, 877'	10	B	60.00	150	-	PVC	30.2	6.94	68.8	-	17	Paddy	Nonexistent	
BD 22-1	Madilau	Kwangko	Manggelewa	Dompu	08° 40, 329'	118° 12, 897'	10	D	3.15	850	1.90	Concrete	29.2	7.06	77.4	25	None	None	Reducing GWL	
BB 22-2	PDAM	Kwangko	Manggelewa	Dompu	08° 40, 669'	118° 13, 382'	15	B	120.00	250	3.10	Galv. Steel	31.3	6.69	62.5	-	None	None	Nonexistent	
BB 22-3	A. Talik	Kwangko	Manggelewa	Dompu	08° 40, 499'	118° 13, 313'	10	HB	6.50	50	-	Galv. Steel	31.3	6.74	134.2	250	None	None	Saline	
BD 22-4	Faridz	Kwangko	Manggelewa	Dompu	08° 40, 400'	118° 13, 356'	10	D	4.00	850	2.05	Rock	30.2	6.98	102.8	45	None	None	Reducing GWL	

Note : BD: NTB-Dug Well, BB: NTB-Tube Well, D: Dug Well, HB: Hand Tube Well, B: Tube Well, GWL: Groundwater level

List of Springs - NTB (1)

No.	Name	Location						Geology of Origin	Site protection		Water Amount		Water Quality			Groundwater Use			Problems with Water	Remarks
		Village	Sub-District	District	Lat. (°)	Long. (°)	Alt. (m)		Type	Material	Amount (L/sec)	Method	WT (°C)	pH	EC (mS/m)	Domestic	Irrigation	Crops		
																No. of Per	Area(ha)			
BS 1-1	Kelongkong	Kuranji	Labuapi	Lombok Barat	08° 38, 082'	116° 04, 961'	5	Quart. volcanic product	Broncapterin	Concrete	1.10	Velocity	28.8	6.69	20.9	650	None	None	Nonexistent	
BS 1-2	Mapak Dasan	Kuranji	Labuapi	Lombok Barat	08° 37, 558'	116° 05, 000'	5	Quart. volcanic product	Wall	Brick	6.80	Direct	29.6	6.65	34.7	2000	None	None	Reducing Water	
BS 3-1	Prabe	Sembung	Narmada	Lombok Barat	08° 36, 786'	116° 09, 661'	40	Quart. volcanic product	Broncapterin	Concrete	4.50	Direct	29.8	6.66	28.7	700	None	None	Nonexistent	
BS 3-2	Kebon Bawa	Sembung	Narmada	Lombok Barat	08° 36, 624'	116° 09, 900'	45	Quart. volcanic product	Broncapterin	Concrete	4.40	Direct	28.0	6.60	12.5	500	None	None	Reducing Water	
BS 4-1	Trawasan	Duman	Narmada	Lombok Barat	08° 30, 606'	116° 10, 491'	380	Quart. volcanic product	Broncapterin	Concrete	30.10	Velocity	29.2	7.63	5.5	3000	None	None	Nonexistent	
BS 4-2	Duman	Duman	Narmada	Lombok Barat	08° 33, 942'	116° 09, 009'	55	Terrace deposits	Broncapterin	Concrete	0.10	Watching	29.2	6.42	18.1	100	None	None	Reducing Water	
BS 4-3	Embung Pas	Lengko	Narmada	Lombok Barat	08° 33, 756'	116° 09, 426'	60	Quart. volcanic product	-	-	1.60	Direct	28.1	6.68	12.4	100	None	None	Nonexistent	
BS 5-1.1	Pura Petong	Suranadi	Narmada	Lombok Barat	08° 34, 467'	116° 13, 497'	160	Quart. volcanic product	None	None	23.90	Velocity	21.7	7.45	14.3	125	None	None	Nonexistent	
BS 5-1.2	Pura Pucuk	Suranadi	Narmada	Lombok Barat	08° 34, 619'	116° 13, 566'	160	Quart. volcanic product	Broncapterin	Concrete	5.30	Direct	22.5	7.52	15.4	None	None	None	Nonexistent	
BS 5-2	Pancor Godang	Peresak	Narmada	Lombok Barat	08° 35, 578'	116° 12, 605'	130	Quart. volcanic product	Broncapterin	Concrete	17.60	Direct	23.6	6.88	15.4	300	None	None	Nonexistent	
BS 5-3	Tebao	Peresak	Narmada	Lombok Barat	08° 35, 517'	116° 13, 420'	150	Terrace deposits	Broncapterin	Concrete	3.50	Direct	28.3	6.64	23.1	200	None	None	Qual.Deterioration	
BS 7-1	Kuripan Tongk	Kuripan	Kediri	Lombok Barat	08° 40, 254'	116° 09, 987'	30	Terrace deposits	Broncapterin	Concrete	1.90	Velocity	28.4	6.68	35.6	1000	None	None	Nonexistent	
BS 9-1	Tune	Rembitan	Pujut	Lombok Tengah	08° 50, 941'	116° 17, 223'	140	Tert. sedimentary rocks	None	None	1.60	Velocity	27.9	7.94	43.5	200	None	None	Nonexistent	
BS 10-1	Balas I	Ketangga	Pringgabaya	Lombok Timur	08° 32, 574'	116° 34, 192'	220	Quart. volcanic product	None	None	8.00	Velocity	25.4	7.12	15.5	2000	1	Paddy	Nonexistent	
BS 10-2	Telaga Murni	Bagik Papa	Pringgabaya	Lombok Timur	08° 34, 408'	116° 35, 440'	95	Quart. volcanic product	Broncapterin	Concrete	125.70	Velocity	25.6	7.19	19.5	3000	None	None	Nonexistent	
BS 11-1	Lemor	Swela	Swela	Lombok Timur	08° 30, 743'	116° 33, 892'	420	Quart. volcanic product	Broncapterin	Concrete	355.30	Velocity	22.1	6.62	16.0	6000	2700	Paddy	Reducing Water	
BS 13-1	Rimas	Mapin Rea	Alas Barat	Sumbawa	08° 34, 638'	116° 57, 803'	180	Tert. volcanic rocks	Broncapterin	Concrete	6.90	Velocity	30.2	7.50	39.1	5000	None	None	Reducing Water	
BS 15-1	Ai Selalu	Poto	Moyo Hilir	Sumbawa	08° 30, 899'	117° 27, 614'	50	Tert. sedimentary rocks	None	None	7.00	Velocity	27.8	7.71	46.2	None	60	Paddy	Nonexistent	
BS 16-1	Oincama	Piong	Sanggar	Bima	08° 21, 845'	118° 14, 853'	30	Quart. volcanic product	Filt. Gallery	Concrete	7.40	Velocity	29.2	7.65	40.8	1600	None	None	Nonexistent	
BS 17-1	Nanga Nae	Lb. Kenang	Tambora	Bima	08° 08, 752'	117° 46, 423'	10	Quart. volcanic product	Broncapterin	Concrete	103.00	Velocity	23.8	6.88	22.1	175	None	None	Nonexistent	

Note : BS: NTB-Spring

List of Springs - NTB (2)

No.	Name	Location						Geology of Origin	Site protection		Water Amount		Water Quality			Groundwater Use			Problems with Water Source	Remarks
		Village	Sub-District	District	Lat. (°)	Long. (°)	Alt. (m)		Type	Material	Amount (L/sec)	Method	WT (°C)	pH	EC (mS/m)	Irrigation				
																No. of Per	Area(ha)	Crops		
BS 18-1	Lante	Kawuwu	Langgudu	Bima	08° 37, 916'	118° 46, 440'	75	Terrace deposits	None	None	0.00	Watching	30.2	6.98	34.3	300	None	None	Nonexistent	
BS 18-2	Mpubeda	Kawuwu	Langgudu	Bima	08° 37, 402'	118° 47, 204'	280	Tert. sedimentary rocks	None	None	1.50	Watching	28.1	7.51	22.5	300	None	None	Nonexistent	
BS 18-3	-	Kawuwu	Langgudu	Bima	08° 35, 485'	118° 47, 265'	260	Terrace deposits	None	None	0.10	Watching	28.1	7.02	42.3	none	None	None	Nonexistent	
BS 18-4	Oiua	Kawuwu	Langgudu	Bima	08° 37, 537'	118° 47, 053'	200	Tert. sedimentary rocks	Broncaptering	Rock	1.50	Watching	28.1	7.08	63.6	50	None	None	Reducing Water	
BS 19-1	Madan Libi	Ranggo	Huu	Dompu	08° 36, 106'	118° 28, 261'	50	Tert. sedimentary rocks	None	None	4.80	Velocity	27.0	7.51	70.1	2000	None	None	Nonexistent	
BS 21-1	Hodo	Doropeti	Pekat	Dompu	08° 27, 022'	118° 04, 093'	0.5	Quart. volcanic product	None	None	294.00	Velocity	28.1	7.68	138.8	1000	None	None	Nonexistent	
BS 22-1	Ncuni	Kwangko	Manggelewa	Dompu	08° 40, 702'	118° 14, 546'	50	Quart. volcanic product	None	None	4.90	Velocity	28.1	8.09	78.6	60	None	None	Reducing Water	

Note : BS: NTB-Spring

List of Existing Wells - NTT (1)

No.	Name	Location						Type of Well	Well Structure				Water Quality			Groundwater Use			Problems with Water	Remarks
		Village	Sub-District	District	Lat. (°)	Long. (°)	Alt. (m)		Dep. (m)	Dia. (mm)	GWL (m)	Casing Mat.	WT (°C)	pH	EC (mS/m)	Domestic	Irrigation			
																No. of Per	Area(ha)	Crops		
TT 4-1	Nitung	Mekendetung	Kewapante	Sikka	08°41'27"	122°15'48"	215	T	2.75	250	-	Concrete	24.9	7.68	11.7	350		None	Drying up	
TT 4-2	Wololuma	Mekendetung	Kewapante	Sikka	08°42'09"	122°15'38"	340	T	1.5	300	-	Concrete	27.1	7.56	21.6	500		None	Drying up	
TT 4-3	Kange-1	Mekendetung	Kewapante	Sikka	08°42'05"	122°15'26"	395	T	1.9	200	-	Concrete	26.8	8.19	8.0	180		None	Drying up	
TT 4-4	Kange-2	Mekendetung	Kewapante	Sikka	08°41'58"	122°15'29"	375	T	1.55	300	-	Concrete	25.7	9.59	11.0	50		None	Drying up	
TT 4-5	Wolooa	Mekendetung	Kewapante	Sikka	08°41'57"	122°15'42"	295	T	1.5	300	-	Concrete	27.6	8.55	5.1	175		None	Drying up	
TT 5-1	Kahat	Kokowahor	Kewapante	Sikka	08°39'17"	122°16'22"	60	T	1.65	380	-	Concrete	27.8	9.62	15.2	30		None	Drying up	
TT 5-2	Horinmude	Kokowahor	Kewapante	Sikka	08°39'33"	122°16'06"	85	T	2.23	300	-	Concrete	27.6	7.86	12.6	10		None	Drying up	
TT 5-3	Liangtahan	Kokowahor	Kewapante	Sikka	08°40'36"	122°15'41"	210	T	2.48	213	-	Concrete	26.5	8.43	9.5	5		None	Drying up	
TT 5-4	11 i - 1	Kokowahor	Kewapante	Sikka	08°40'45"	122°16'03"	200	T	1.7	240	-	Concrete	28.5	8.88	7.6	50		None	Drying up	
TT 5-5	11 i - 2	Kokowahor	Kewapante	Sikka	08°40'58"	122°15'59"	165	T	4	500	-	Concrete	28.2	7.90	2.4	25		None	Drying up	
TD 6-1	Aba Hading	Sinar Hading	Tanjung Bunga	Flores Timur	08°16'17"	122°53'42"	5	D	3.75	1100	2.35	Rock	31.3	6.54	42.2	650		None	Reducing GWL	
TD 6-2	Aba Hading	Sinar Hading	Tanjung Bunga	Flores Timur	08°16'25"	122°53'40"	3	D	3.15	900	2.65	Rock	33.4	6.39	102.2	650		None	Reducing GWL	
TD 6-3	Dekaharut	Sinar Hading	Tanjung Bunga	Flores Timur	08°16'08"	122°53'41"	2	D	1.8	1000	1.05	Rock	39.2	6.42	47.7	650		None	Reducing GWL	
TD 6-4	Wolosina	Sinar Hading	Tanjung Bunga	Flores Timur	08°16'01"	122°53'41"	2	D	1	1200	0.60	Concrete	29.2	6.40	41.9	650		None	Reducing GWL	
TD 7-1	Rian Tobi	Ille Padung	Tanjung Bunga	Flores Timur	08°17'38"	122°52'01"	5	D	4.48	800	3.76	Concrete	30.2	6.61	57.8	650		None	Reducing GWL	
TD 7-2	Riang Pedang	Ille Padung	Tanjung Bunga	Flores Timur	08°17'23"	122°52'47"	5	D	5.43	1100	4.60	Rock	31.3	6.53	66.7	650		None	Reducing GWL	
TD 9-2	Puumbara	Borokanda	Ende Selatan	Ende	08°48'37"	121°35'43"	8	D	6	200	5.00	Concrete	28.6	7.62	158.3	40		None	Reducing GWL	
TD 9-3	Pautora	Borokanda	Ende Selatan	Ende	08°48'37"	121°35'43"	12	D	12	200	11.20	Concrete	28.5	7.39	89.0	60		None	Reducing GWL	
TD 10-1	Reda Rangga-1	Bheramari	Nangapanda	Ende	08°47'40"	121°33'08"	20	D	12	125	8.70	Concrete	27.0	7.11	47.7	60		None	Reducing GWL	
TD 10-2	Reda Rangga-2	Bheramari	Nangapanda	Ende	08°47'47"	121°32'56"	10	D	6	200	4.70	Concrete	27.9	7.36	76.7	80		None	Reducing GWL	
TD 10-3	Reda Rangga-3	Bheramari	Nangapanda	Ende	08°47'49"	121°33'05"	10	D	3	125	1.70	Concrete	27.1	7.26	47.2	60		None	Reducing GWL	
TD 11-3	Maurongga	Nggorea	Nangapanda	Ende	08°48'06"	121°31'57"	17	D	15.5	200	14.50	Concrete	27.1	7.09	68.8	50		None	Reducing GWL	
TD 11-4	Maunggora	Nggorea	Nangapanda	Ende	08°48'14"	121°30'51"	15	D	10	200	8.15	Concrete	28.6	7.31	124.6	150		None	Reducing GWL	
TD 11-5	Penggajawa	Nggorea	Nangapanda	Ende	08°47'56"	121°29'36"	15	D	12	150	8.83	Concrete	29.3	7.55	232.0	90		None	Reducing GWL	

Note : TD: NTT-Dug Well, TT: NTT-Tank Water (Rain Water), D: Dug Well, T: Tank Water (Rain Water), GWL: Groundwater level

List of Existing Wells - NTT (2)

No.	Name	Location						Type of Well	Well Structure				Water Quality			Groundwater Use			Problems with Water	Remarks
		Village	Sub-District	District	Lat. (°)	Long. (°)	Alt. (m)		Dep. (m)	Dia. (mm)	GWL (m)	Casing Mat.	WT (°C)	pH	EC (mS/m)	Domestic	Irrigation			
																No. of Per	Area(ha)	Crops		
TT 13-1	Napungliti	Hepang	Lela	Sikka	08°42'47"	122°09'12"	170	T	2	300	-	Concrete	26.9	7.95	9.0	100	None	Drying up		
TD 13-3	Bangobaler	Hepang	Lela	Sikka	08°43'40"	122°08'32"	5	D	4	150	3.53	Concrete	32.8	7.52	252.0	>250	None	Reducing GWL		
TT 13-5	Wololora	Hepang	Lela	Sikka	08°42'41"	122°09'57"	265	T	2	220	-	Concrete	29.6	8.43	7.6	50	None	Drying up		
TT 14-1	Bloro-1	Bloro	Nita	Sikka	08°40'38"	122°09'25"	335	T	2.5	250	-	Concrete	26.2	9.41	12.9	75	None	Drying up		
TT 14-3	Bloro-2	Bloro	Nita	Sikka	08°41'04"	122°09'37"	290	T	4	400	-	Concrete	28.4	7.62	8.1	50	None	Drying up		
TT 15-1	Wetakara	Watuliwung	Kewapante	Sikka	08°40'07"	122°15'12"	165	T	2.5	500	-	Concrete	22.0	6.99	15.0	75	None	Nonexistent		
TB 15-2	Wairhubing-1	Watuliwung	Kewapante	Sikka	08°38'33"	122°15'22"	30	B	60	20	-	Steel	41.8	7.78	134.7	100	None	Drying up		
TD 15-3	Wairhubing-2	Watuliwung	Kewapante	Sikka	08°38'07"	122°15'21"	10	D	7.5	100	6.80	Concrete	32.9	8.13	23.8	5	None	Reducing GWL		
TD 15-4	Wairhubing-3	Watuliwung	Kewapante	Sikka	08°38'14"	122°15'27"	15	D	10	75	9.10	Concrete	28.3	8.25	22.6	20	None	Reducing GWL		
TT 15-5	Watuliwung	Watuliwung	Kewapante	Sikka	08°39'29"	122°15'18"	75	T	-	-	-	Concrete	25.1	8.15	18.3	75	None	Drying up		
TT 16-1	Katamawee	Patiala Dete	Walakaka	Sumba Barat	09°43'11"	121°17'33"	165	T	1.6	240	-	Concrete	27.5	9.13	4.0	20	None	Drying up		
TD 17-1	Padaka	Welibo	Walakaka	Sumba Barat	09°43'18"	121°20'07"	25	D	5	100	3.00	Concrete	28.4	6.85	61.5	200	None	Reducing GWL		
TD 19-2	Kilimbatu Bala	Kondamara	Lewa	Sumba Timur	09°39'47"	119°54'43"	440	D	7	100	3.00	Concrete	25.8	7.32	52.8	15	None	Reducing GWL		
TD 19-4	Pandulajangga	Kondamara	Lewa	Sumba Timur	09°39'06"	119°55'05"	460	D	5.5	100	2.50	Concrete	25.0	6.93	46.8	50	None	Reducing GWL		
TD 19-5	Kilimbatu Bala	Kondamara	Lewa	Sumba Timur	09°40'04"	119°54'49"	425	D	14	100	7.00	Concrete	25.9	7.35	42.3	75	None	Reducing GWL		
TD 20-1	Pahomba-1	Pulupanjang	Pandawai	Sumba Timur	09°46'53"	120°03'24"	420	D	5	125	2.00	Concrete	26.9	7.01	59.0	35	None	Drying up		
TD 20-2	Pahomba-2	Pulupanjang	Pandawai	Sumba Timur	09°46'44"	120°03'27"	415	D	8	125	6.00	Concrete	25.1	7.44	48.7	Unused	None	Drying up		
TD 21-1	Oekopi - 1	Oebau	Pantai Baru	Kupang	10°42'41"	123°16'30"	150	D	7	100	3.00	Concrete	28.6	6.61	81.1	200	None	Nonexistent		
TD 21-2	Oekopi - 2	Oebau	Pantai Baru	Kupang	10°42'40"	123°16'32"	145	D	6	150	2.00	Concrete	28.7	6.67	84.0	50	None	Drying up		
TD 21-3	Ladeoden	Oebau	Pantai Baru	Kupang	10°42'18"	123°15'36"	103	D	3	250	1.30	Concrete	27.5	6.65	87.5	75	None	Reducing GWL		
TD 22-3	Lolale	Sonimanu	Pantai Baru	Kupang	10°42'48"	123°17'25"	10	D	9	200	1.50	Concrete	28.0	7.04	107.3	100	None	Reducing GWL		
TD 22-5	Oekima	Sonimanu	Pantai Baru	Kupang	10°42'01"	123°18'10"	4	D	3	150	0.50	Concrete	27.4	7.08	78.9	150	None	Reducing GWL	Loc. near Oekima sp.	

Note : TD: NTT-Dug Well, TT: NTT-Tank Water (Rain Water), TB: NTT-Tube Well, D: Dug Well, T: Tank Water (Rain Water), B: Tube Well, GWL: Groundwater level

List of Existing Wells - NTT (3)

No.	Name	Location						Type of Well	Well Structure				Water Quality			Groundwater Use			Problems with Water	Remarks
		Village	Sub-District	District	Lat. (°)	Long. (°)	Alt. (m)		Dep. (m)	Dia. (mm)	GWL (m)	Casing Mat.	WT (°C)	pH	EC (mS/m)	Domestic	Irrigation			
																No. of Per	Area(ha)	Crops		
TD 23-4	Andreas B.	Nasakdale	Pantai Baru	Kupang	10°44'48"	123°14'11"	30	D	3	200	2.50	Concrete	28.5	7.72	57.4	25	None	Reducing GWL		
TD 23-5	Bengobelan	Nasakdale	Pantai Baru	Kupang	10°44'44"	123°14'40"	2	D	6	150	2.50	Concrete	30.2	6.75	175.8	75	None	Reducing GWL		
TD 24-1	Lingkungan-2	Tarus	Kupang	Kupang	10°08'00"	123°41'08"	10	D	8	200	6.50	Concrete	28.2	7.01	62.0	75	None	Reducing GWL		
TD 24-2	Lingkungan-5	Tarus	Kupang	Kupang	10°07'06"	123°41'49"	5	D	2	60	1.00	None	28.2	7.16	104.8	150	None	Reducing GWL		
TD 24-3	Lingkungan-5	Tarus	Kupang	Kupang	10°08'03"	123°41'35"	25	D	9	200	7.00	Concrete	28.7	7.15	53.4	10	None	Reducing GWL		
TD 24-4	Lingkungan-4	Tarus	Kupang Barat	Kupang	10°08'12"	123°41'38"	30	D	14	200	11.50	Concrete	28.7	7.21	56.7	10	None	Reducing GWL		
TD 25-1	Dusun-2	Bolok	Kupang Barat	Kupang	10°13'30"	123°31'11"	30	D	29.5	260	29.00	Concrete	28.8	6.78	91.8	750	None	Nonexistent		
TD 25-2	Dusun-5	Bolok	Kupang Barat	Kupang	10°13'39"	123°31'15"	32	D	31	200	29.40	Concrete	28.9	6.87	67.2	100	None	Nonexistent		
TD 25-3	Dusun-5	Bolok	Kupang Barat	Kupang	10°13'23"	123°31'37"	48	D	47	200	46.60	Concrete	28.7	7.12	61.2	125	None	Nonexistent		
TD 25-4	Dusun-3	Bolok	Kupang Barat	Kupang	10°13'54"	123°31'07"	23	D	19	250	18.00	Concrete	28.5	7.31	130.0	200	None	Nonexistent		

Note : TD: NTT-Dug Well, D: Dug Well, GWL: Groundwater level

List of Springs - NTT(1)

No.	Name	Location						Geology of Origin	Site protection		Water Amount		Water Quality			Groundwater Use			Problems with Water	Remarks
		Village	Sub-District	District	Lat. (°)	Long. (°)	Alt. (m)		Type	Material	Amount (L/sec)	Method	WT (°C)	pH	EC (mS/m)	Domestic	Irrigation	Crops		
																No. of Per	Area(ha)			
TS 6-1	Watohoko	Sinar Hading	Tanjung Bunga	Flores Timur	08°16'46"	122°53'28"	0.5	Tert. volcanic rock	-	-	1	Watching	48.5	5.93	180.3	-	1	None	Nonexistent	
TS 7-1-1	Wai Laun	Ille padung	Tanjung Bunga	Flores Timur	08°17'27"	122°52'29"	5	Tert. volcanic rock	Broncaptering	Concrete	10	Watching	31.3	6.60	74.2	1000	1	None	Nonexistent	
TS 7-2	Balatawa	Ille padung	Tanjung Bunga	Flores Timur	08°19'29"	122°52'04"	760	Tert. volcanic rock	-	-	1	Poly Bag	0.2	7.20	17.3	-	1	None	Nonexistent	
TS 7-1-2	Wai Laun	Ille padung	Tanjung Bunga	Flores Timur	08°17'27"	122°52'29"	5	Tert. volcanic rock	Broncaptering	Concrete	50	Velocity	30.4	6.75	70.8	1000	1	None	Nonexistent	
TS 8-1	Berekele	Watuneso	Wolowaru	Ende	08°44'07"	121°56'43"	650	Tert. volcanic rock	None	-	4	Bucket	22.0	6.99	15.0	90		None	Nonexistent	
TS 8-2	Aepetu	Watuneso	Wolowaru	Ende	08°47'42"	121°58'33"	60	Tert. volcanic rock	Broncaptering	Concrete	1	Poly bag	41.8	7.78	134.7	-		None	Nonexistent	
TP 8-3	Liatola	Watuneso	Wolowaru	Ende	08°47'39"	121°58'34"	60	-	Pipe	Steel	-	-	32.9	8.13	23.8	10		None	Nonexistent	
TP 8-4	Tolijana	Watuneso	Wolowaru	Ende	08°47'07"	121°58'32"	85	-	Pipe	Steel	-	-	28.3	8.25	22.6	50		None	Nonexistent	
TR 8-5	Kopowatu	Watuneso	Wolowaru	Ende	08°46'50"	121°57'40"	125	-	Broncaptering	Concrete	-	-	25.1	8.15	18.3	-		None	Nonexistent	
TP 9-1	Barai Wena	Borokanda	Ende Selatan	Ende	08°49'14"	121°36'14"	10	-	-	-	-	-	28.4	7.01	33.8	60	-	-		
TS 9-4	Rawa Aeromba-1	Borokanda	Ende Selatan	Ende	08°47'23"	121°36'40"	135	Tert. volcanic rock	None	-	1.5	Floating object	28.0	7.43	41.6	Unused		None	Nonexistent	
TS 9-5	Rawa Aeromba-2	Borokanda	Ende Selatan	Ende	08°47'25"	121°36'37"	140	Tert. volcanic rock	None	-	0.5	Floating object	27.9	7.13	46.4	Unused		None	Nonexistent	
TS 10-4	Aepara	Bheramari	Nangapanda	Ende	08°46'21"	121°31'55"	260	Tert. volcanic rock	None	-	0.5	Watching	25.0	7.21	44.9	Unused		None	Reducing water	
TR 10-5	Agana	Bheramari	Nangapanda	Ende	08°46'21"	121°31'55"	260	Tert. volcanic rock	None	-	2500	Watching	25.0	8.13	41.6	Unused		None	Reducing water	
TP 11-1	Maurongga	Nggorea	Nangapanda	Ende	08°48'04"	121°31'54"	17	-	Pipe	PVC	10	Poly bag	26.2	7.35	57.6	325		None	Nonexistent	From Aesonga sp.
TS 11-2	Aesonga	Nggorea	Nangapanda	Ende	08°47'28"	121°31'48"	75	Breccia, Tuff	Broncaptering	Concrete	12	Watching	25.8	7.41	56.0	325		None	Nonexistent	
TS 12-1	Aeweo	Ndetundora	Ende Selatan	Ende	08°47'58"	121°38'17"	520	Sandy Tuff, Tuff	None	-	1.2	Velocity	24.7	6.98	34.6	50		None	Reducing water	
TS 12-2	Aedjaru	Ndetundora	Ende Selatan	Ende	08°47'54"	121°38'14"	523	Sandy Tuff, Tuff	None	-	0.4	Velocity	24.8	6.63	34.7	50		None	none existent	
TS 12-3	Aepota-3	Ndetundora	Ende Selatan	Ende	08°47'52"	121°38'13"	525	Sandy Tuff, Tuff	None	-	2.5	Velocity	24.5	6.82	18.2	Unused		None	Reducing water	
TS 12-4	Aepota-2	Ndetundora	Ende Selatan	Ende	08°47'51"	121°38'12"	525	Sandy Tuff, Tuff	None	-	5	Velocity	24.3	6.83	18.8	60		None	Nonexistent	
TS 12-5	Aepota-1	Ndetundora	Ende Selatan	Ende	08°47'50"	121°38'11"	530	Sandy Tuff, Tuff	None	-	6	Velocity	24.7	6.68	26.9	Unused		None	Nonexistent	
TS 13-2	Wairdoik	Hepang	Lela	Sikka	08°42'20"	122°08'45"	70	Sandy Tuff, Cgl	Broncaptering	Concrete	0.7	Poly bag	26.3	7.24	54.6	50		None	Nonexistent	
TP 13-4	Lagokagur	Hepang	Lela	Sikka	08°43'38"	122°09'20"	20	-	Pipe	Steel	-	-	29.0	7.47	54.8	>500		None	Nonexistent	

Note : TS: NTT-Spring, TP: NTT-Stand pipe, TR: NTT-River, S: Spring, P: Stand Pipe, R: River

List of Springs - NTT(2)

No.	Name	Location					Geology of Origin	Site protection		Water Amount		Water Quality			Groundwater Use			Problems with Water	Remarks	
		Village	Sub-District	District	Lat. (°)	Long. (°)		Alt. (m)	Type	Material	Amount (L/sec)	Method	WT (°C)	pH	EC (mS/m)	Domestic	Irrigation			
																No. of Per	Area(ha)			Crops
TP 14-2	Koligahar	Bloro	Nita	Sikka	08°40'07"	122°08'59"	435	-	Pipe	Steel	-	-	26.6	7.62	24.4	200		None	Nonexistent	
TS 14-4	Diruk	Bloro	Nita	Sikka	08°39'29"	122°07'48"	713	Sandy Tuff, Breccia	Broncaptering	Concrete	1	Poly bag	24.1	7.78	23.5	2 Villages		None	Nonexistent	
TS 14-5	Watugong	Bloro	Nita	Sikka	08°39'18"	122°08'17"	550	Sandy Tuff, Breccia	Broncaptering	Concrete	0.02	Poly bag	25.0	7.43	25.8	-		None	Nonexistent	
TS 16-2	Kapaka Bisa	Patiala Dete	Walakaka	Sumba Barat	09°43'11"	121°17'33"	160	Sandstone, siltstone	Broncaptering	Rocks	<0.2	Watching	28.7	7.08	38.4	35		None	Nonexistent	
TS 16-3	Wee Kuta	Patiala Dete	Walakaka	Sumba Barat	09°43'11"	121°17'33"	175	Sandstone, siltstone	None	-	1	Watching	26.7	6.56	27.5	100		None	Nonexistent	
TS 16-4	Wee lagaya	Patiala Dete	Walakaka	Sumba Barat	09°43'11"	121°17'33"	145	Sandstone, siltstone	None	-	0.5	Watching	27.3	7.13	46.8	200		None	Nonexistent	
TR 16-5	Lokowunta	Patiala Dete	Walakaka	Sumba Barat	09°43'11"	121°17'33"	145	Sandstone, siltstone	None	-	>2000	Watching	29.5	8.48	26.0	50		None	Reducing water	
TS 17-2	Litti Dete	Welibo	Walakaka	Sumba Barat	09°43'17"	121°19'59"	75	Sandstone, siltstone	Broncaptering	Concrete	0.5	Watching	27.3	7.08	40.4	50		None	Nonexistent	
TS 17-3	Wee Karara	Welibo	Walakaka	Sumba Barat	09°43'27"	121°19'48"	145	Sandstone, siltstone	None	-	3	Watching	26.8	7.84	39.4	110		None	Nonexistent	
TS 17-4	Wee Lowa	Welibo	Walakaka	Sumba Barat	09°42'54"	121°20'15"	40	Sandstone, siltstone	Broncaptering	Concrete	0.5	Watching	26.5	6.83	62.8	60		None	Nonexistent	
TS 17-5	Wee Lega	Welibo	Walakaka	Sumba Barat	09°44'11"	121°19'44"	45	Sandstone, siltstone	Broncaptering	Concrete	0.1	Watching	27.3	6.81	56.8	220		None	Nonexistent	
TS 18-1	Wee Labonga	Weerame	Wejewa	Sumba Barat	09°32'44"	119°17'11"	420	Coral. Limenstone	None	-	6.5	Watching	23.7	7.48	39.3	70	3		Reducing water	
TS 18-2	Wee Maliti	Weerame	Wejewa	Sumba Barat	09°32'46"	119°17'18"	430	Coral. Limenstone	Broncaptering	Concrete	10	Watching	24.7	7.42	37.7	60		None	Nonexistent	
TS 18-3	Wee Rame	Weerame	Wejewa	Sumba Barat	09°32'45"	119°17'21"	425	Coral. Limenstone	Broncaptering	Concrete	50	Watching	23.7	7.38	36.4	>500	15		Nonexistent	
TS 18-4	Wee Lebara	Weerame	Wejewa	Sumba Barat	09°32'15"	119°16'42"	635	Coral. Limenstone	Broncaptering	Concrete	10	Watching	23.5	7.44	37.9	>500	2		Nonexistent	
TS 18-5	Wee Paneru	Weerame	Wejewa	Sumba Barat	09°32'11"	119°19'44"	450	Coral. Limenstone	None	-	>5000	Watching	24.3	7.17	39.9	>500		None	Reducing water	
TS 19-1	Wowo	Kondamara	Lewa	Sumba Timur	09°39'43"	119°54'37"	430	Coral. Limenstone	None	-	20	Watching	25.2	7.35	29.4			None	Nonexistent	Lower than irr. area
TS 19-3	Lailama	Kondamara	Lewa	Sumba Timur	09°38'42"	119°55'44"	470	Coral. Limenstone	Broncaptering	Concrete	28.8	Velocity	25.5	7.18	40.5	1500	160		Reducing water	
TS 20-3	Rirara	Pulupanjang	Pandawai	Sumba Timur	09°46'46"	120°03'09"	425	Sandy Limenstone	None	-	0.2	Watching	25.6	7.25	47.3	70		None	Drying up	Marl intercal. w/ sandy lstone
TR 20-4	Kanyangga Nggy	Pulupanjang	Pandawai	Sumba Timur	09°46'46"	120°03'09"	425		-	-	5	Watching	29.6	8.05	39.9	200		None	Drying up	
TR 20-5	Palahunda	Pulupanjang	Pandawai	Sumba Timur	09°46'41"	120°03'09"	408		-	-	>2000	Watching	26.5	8.00	41.0	50		None	Reducing water	Use in dry season
TS 21-4	Sibasoe -1	Oebau	Pantai Baru	Kupang	10°42'18"	123°14'45"	160	Coral. Limenstone	Broncaptering	Concrete	0.3	Watching	28.4	6.65	34.7	50	2		Reducing water	
TS 21-5	Sibasoe -2	Oebau	Pantai Baru	Kupang	10°42'18"	123°14'45"	160	Coral. Limenstone	None	-	1.0	Watching	27.3	6.73	68.3	50	2		Reducing water	

Note : TS: NTT-Spring, TP: NTT-Stand pipe, TR: NTT-River, S: Spring, P: Stand Pipe, R: River

List of Springs - NTT (3)

No.	Name	Location						Geology of Origin	Site protection		Water Amount		Water Quality			Groundwater Use			Problems with Water	Remarks
		Village	Sub-District	District	Lat. (°)	Long. (°)	Alt. (m)		Type	Material	Amount (L/sec)	Method	WT (°C)	pH	EC (mS/m)	Domestic	Irrigation	Crops		
																No. of Per	Area(ha)			
TS 22-1	Vuvuno	Sonomanu	Pantai Baru	Kupang	10°43'23"	123°17'12"	35	Coral. Limenstone	Broncaptering	Concrete	5	Watching	29.3	6.63	88.3	300		None	Nonexistent	
TS 22-2	Oelea	Sonomanu	Pantai Baru	Kupang	10°43'15"	123°16'15"	100	Coral. Limenstone	None	-	1	Watching	27.2	6.90	79.0	-		1	Nonexistent	
TS 22-4	Oekima	Sonomanu	Pantai Baru	Kupang	10°42'01"	123°18'10"	10	Coral. Limenstone	None	-	0.5	Watching	29.5	6.88	83.3	150		None	Nonexistent	
TS 23-1	Oeleak	Nasakdale	Pantai Baru	Kupang	10°44'58"	123°14'20"	1	Coral. Limenstone	Broncaptering	Concrete	1.0	Watching	28.5	6.92	101.0	1500		None	Nonexistent	
TS 23-2	Meakuin -1	Nasakdale	Pantai Baru	Kupang	10°44'43"	123°13'31"	80	Coral. Limenstone	Broncaptering	Concrete	2.0	Watching	27.3	6.88	57.2	35		None	Nonexistent	
TS 23-3	Meakuin -2	Nasakdale	Pantai Baru	Kupang	10°44'43"	123°13'31"	80	Coral. Limenstone	Broncaptering	Concrete	-	-	27.5	6.88	58.2	-		None	Nonexistent	Meakuin -1 & 2 very close
TS 24-5	PDAM	Tarus	Kupang	Kupang	10°08'15"	123°41'38"	20	Coral. Limenstone	Broncaptering	Concrete	65	Information	27.9	6.86	53.1	data		7	Nonexistent	
TS 25-5	Oeklaus	Bolok	Kupang Barat	Kupang	10°13'41"	123°31'44"	30	Coral. Limenstone	None	-	2	Watching	28.6	6.86	295.0	50		None	Nonexistent	

Note : TS: NTT-Spring, S: Spring

Appendix 4

ELECTRIC SOUNDING SURVEY / VES-CURVES

Appendix 4
ELECTRIC SOUNDING SURVEY / VES-CURVES

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Appendix 4 ELECTRIC RESISTIVITY SURVEY / VES-CURVES

4.1 Introduction

Geophysical prospecting using the electric resistivity survey was conducted in 20 villages in the Provinces of Nusa Tenggara Barat and Nusa Tenggara Timur. This is the most widely applied surface geophysical survey method for groundwater investigation. The main objectives of carrying out this survey are specified as follows.

- To obtain information on subsurface hydrogeological structures.
- To define depths, thickness and distribution of underlying rock formations.
- To define depths to groundwater level

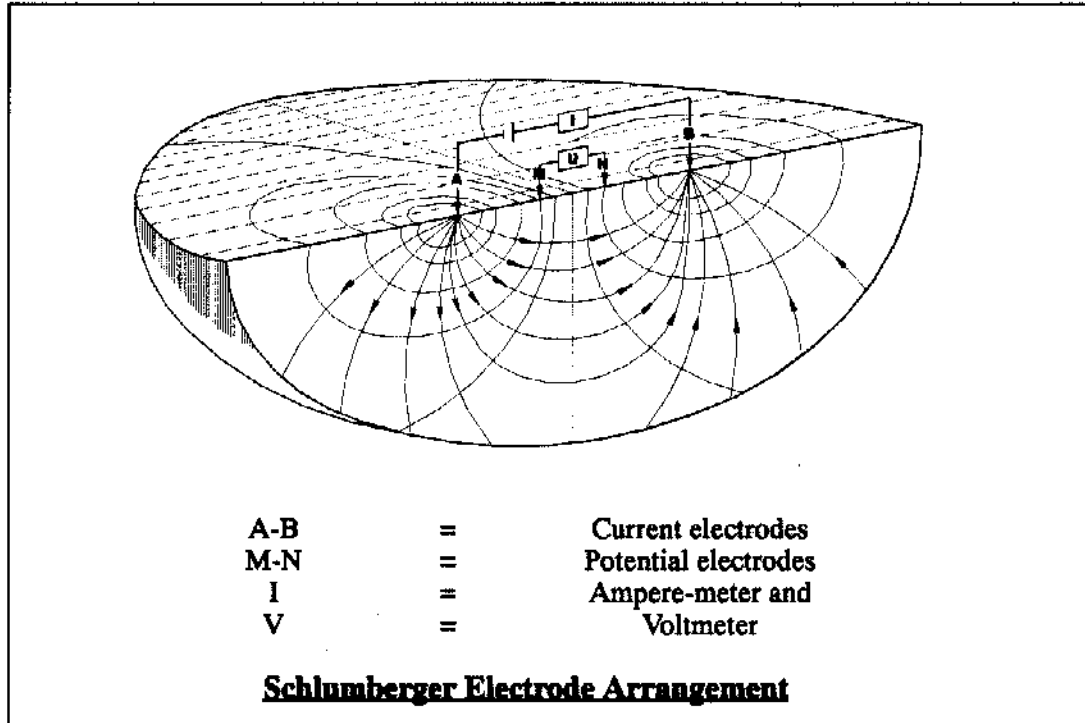
Based upon the information above and geological information, appropriate sites for test wells were proposed.

4.2 Principles of the Electric Resistivity Survey

The electric resistivity survey evaluates the apparent resistivity of subsurface rocks by introducing a known electric current through electrodes driven into the ground. The voltage or potential difference is measured with two potential electrodes located symmetrically along a line between the current electrodes.

The principle of the electric resistivity survey is shown in the figure overleaf, where the current (I) is introduced into the ground through two current electrodes (A-B). The potential difference (ΔV) is measured by the two potential electrodes (M-N) located symmetrically on the line between the current electrodes. The ratio of $\Delta V/I$ gives the resistance; from this ratio and the distance between the electrodes, the resistivity of the ground is defined.

The penetration depth of the electric current is changed by varying the distance between the current electrodes (A) and (B). Increasing the electrode spacing deepens the penetration depth of the electric current. Two different electrode arrangements are known, i.e. the Wenner and the Schlumberger electrode arrangements.



The Schlumberger electrode arrangements were used for this Study due to the following advantages.

- The Schlumberger arrangement is slightly faster as only the current electrodes (M) and (N) need to be shifted during the measurement.
- The Schlumberger arrangement is less sensitive to undetected lateral variations in resistivity, so that the interpretation of the measurements is less complicated.
- The penetration depth of the Schlumberger arrangement is deeper than that by the Wenner arrangement.

In general, the resistivity of rock formations varies over a wide range, depending on the material density. The interpretation of the electric resistivity survey for hydrogeological determinations is based on the physical parameters of the specific electric-resistivity (ρ) of rocks. Subsequently this interpretation must be correlated with the surrounding geological or hydrogeological structure as preparatory work for constructing the vertical and horizontal interpreted geological sections, showing the depths, boundaries between permeable layers, salt water and fresh water, etc.

4.3 Survey Points

400 survey points located in the islands of Lombok, Sumbawa and Flores were measured.

Number of Survey Points

Province	Island	District	Number of Village	Number of survey points
NTB	Lombok	Lombok Barat	2	40
		Lombok Tengah	4	80
		Lombok Timur	1	20
	Sumbawa	Sumbawa	3	60
		Dompu	2	40
		Bima	2	40
NTT	Flores	Sikka	4	80
		Flores Timur	2	40
Total			20	400

Physiographically, most of the selected sites were located on flat terrain underlain by unconsolidated alluvial sediments. Other sites, predominantly those in Flores Island, were located on the lower flanks of volcanic terrain covered by the volcanic products.

Location of the sounding points interpreted longitudinal section and VES curves are attached in this Attachment.

4.4 Lombok Island

In the Island of Lombok seven villages were selected for the Study.

4.4.1 Desa Bajur (NTB #2)

Desa Bajur is located in the coastal plain of Ampenan about 3.5 km east from coastal line. The results of the interpretation of the electric resistivity survey are as follows.

Results of Electric Resistivity Survey (Desa Bajur)

Rock layer unit	Resistivity value	Lithology
I	< 20 Ω m	Clay, silt and sandy clay
II	> 20 Ω m	Sand, gravel and tuffaceous sand with clay intercalation

4.4.2 Desa Peresak (NTB #5)

Desa Peresak is located in the lowermost foothills of Mt. Rinjani, in an undulating terrain having a slope ranging from 3% - 5%. Elevation varies between 120 – 210 m.asl. This village is drained by Kali Babak and Kokok Lobasuren, which form the village boundaries in the south and north respectively. The following three rock layers may be distinguished.

Results of Electric Resistivity Survey (Desa Peresak)

Rock layer unit	Resistivity value	Lithology
I	< 20 Ω m	Fine tuff, clay and silt
II	20 – 35 Ω m	Tuffaceous sand with volcanic breccia intercalation
III	> 35 Ω m	Volcanic breccia with tuffaceous sand intercalation

4.4.3 Desa Jelantik (NTB #6)

Desa Jelantik is located in the Central Lombok plain. The village is situated in the transition zone of the “Tanah Malit” plain in the south and the “Central Plateau” in the north. South of the main Kediri-Praya road, the landform is relatively flat and is covered by “Tanah Malit”, a dark gray soil layer of highly plastic swelling clay. Towards the north, i.e. north of the main-road, this flat landform changes gradually to a steep sloping, low hilly area. Rock layers may be subdivided into the following units.

Results of Electric Resistivity Survey (Desa Jelantik)

Rock layer unit	Resistivity value	Lithology
I	< 15 Ω m	Clay, silt, tuffaceous clay
II	15 – 30 Ω m	Tuffaceous sand with breccia intercalation
III	> 30 Ω m	Tuffaceous breccia

4.4.4 Desa Labulia (NTB #7)

Desa Labulia is located in the southwestern part of the Central Lombok plain, i.e. in the proximity of the folded Tertiary mountains. The plain slopes gradually towards the west and is drained by some small tributaries of the Panunjak river, i.e. the K. Mayung and K. Jereneng. The results of the electric resistivity survey suggests that the rock layers consist mainly of interbedded clayey and sandy layers and breccia.

Results of Electric Resistivity Survey (Desa Labulia)

Rock layer unit	Resistivity value	Lithology
I	< 10 Ω m	Fine tuff, clay, silt
II	10 – 35 Ω m	Tuffaceous sand with inter-bedded breccia
III	> 35 Ω m	Tuffaceous breccia

4.4.5 Desa Setanggor (NTB #8)

Desa Setanggor occupies the southwestern part of the Central Lombok plain in the proximity of the folded Tertiary mountains. Towards the west of this village is bounded by the large Pengga water reservoir. Pleistocene volcanic deposits underlie this village, covered by the superficial deposits of ‘Tanah Malit’. The results of the electric resistivity survey indicate that the volcanic deposits underlying Desa Setanggor are comprised mainly of volcanic breccia, tuffaceous sand and clay.

Results of Electric Resistivity Survey (Setanggor)

Rock layer unit	Resistivity value	Lithology
I	< 10 Ω m	Clay, silt, tuffaceous clay
II	10 – 35 Ω m	Tuffaceous sand with breccia intercalation
III	> 35 Ω m	Volcanic breccia

4.4.6 Desa Rembitan (NTB #9)

Desa Rembitan is located in the Southern Mountain Zone at an elevation between 100 – 140 m.asl. This village is surrounded by some hillocks protruding ten meters above the land surface. The results of the electric resistivity survey indicate that the rock layers mainly consists of the intercalation of bedded tuff and volcanic breccia. These rock layers are classified into three rock layer units.

Results of Electric Resistivity Survey (Rembitan)

Rock layer unit	Resistivity value	Lithology
I	< 10 Ω m	Tuffaceous clay
II	10 – 20 Ω m	Intercalation of breccia and tuff
III	> 20 Ω m	Volcanic breccia

4.4.7 Desa Batu Nampar (NTB #12)

Desa Batu Nampar is located on the coastal plain at Ekas Bay. It is situated on sloping terrain with some hillocks protruding ten meters above the surrounding level. The village is drained by the river Kali Sagikmateng, which originates from the eastern part of the Central Lombok plain. The village lies on Pleistocene volcanic rock, underlain by Tertiary limestone and dacitic rock intrusions.

Results of Electric Resistivity Survey (Desa Batu Nampar)

Rock layer unit	Resistivity value	Lithology
I	< 10 Ω m	Tuffaceous clay sand
II	10 – 50 Ω m	Tuff and breccia
III	200 – 1000 Ω m	Limestone
III	> 1000 Ω m	Intrusive rock

4.5 Sumbawa Island

Seven villages were selected for Electric Resistivity Survey in the island of Sumbawa.

4.5.1 Desa Labuhan Mapin (NTB #13)

Desa Labuhan Mapin is located on the coastal plain of Selat Alas, which is drained by the river Brang Mapin. Towards the west and the south the plain is bounded by a low hilly terrain. Some isolated hillocks ten meters above the surrounding surface are found on this plain. The rock layers may be differentiated into four different rock layers

Results of Electric Resistivity Survey (Desa Labuhan Mapin)

Rock layer unit	Resistivity value	Lithology
I	< 4 Ω m	Clay layer with locally sand deposits
II	7 – 15 Ω m	Clayey and sand deposit
III	2 – 9 Ω m	Tuffaceous clay with intercalated tuffaceous sand
IV	10 - 35 Ω m	Volcanic breccia

The sandy layer inter-bedded within the alluvial deposits may be a good aquifer. The P2AT drilled wells located in Dusun Lekong Bawah (SPS – 46 and SPS – 47) tapped water from an aquifer system at depths varying between 20 – 82 m.bgl. A well point constructed for a farmer in Dusun Hijrah produces artesian water of 0.25 L/sec.

4.5.2 Desa Labuhan Lalar (NTB #14)

Desa Labuhan Lalar is located on the coastal plain in Taliwang Bay at an elevation reaching up to 50 m.asl. The Brang Jereweh river and other small tributaries such as the Brang Petara and the Brang Bagi drain the plain. Some isolated hillocks, ten meters above the surrounding surface, are found on this plain.

Results of Electric Resistivity Survey (Desa Labuhan Lalar)

Rock layer unit	Resistivity value	Lithology
I	< 5 Ωm	Sand, gravel and clayey sand
II	5 – 10 Ωm	Sandy marl / sandy clay intercalation
III	10 – 30 Ωm	Clayey to mainly coral limestone
IV	> 30 Ωm	Tuff and breccia alternation

4.5.3 Desa Poto (NTB #15)

The eastern part of the village is situated on flat terrain, about 3.5 km wide, which is drained by the rivers Brang Moyo and Brang Pongal. Towards the west a low hilly terrain dominates the village. Dusun Poto is located on the rim of this hilly and flat terrain. The rock sequences are divided into three rock layer units.

Results of Electric Resistivity Survey (Desa Poto)

Rock layer unit	Resistivity value	Lithology
I	10 - 20 Ωm	Sand and gravel
II	< 10 Ωm	Clay, tuffaceous clay and tuffaceous sand (saline aquifer)
III	> 15 Ωm	Limestone

4.5.4 Desa Piong (NTB #16)

Desa Piong is located on the coastal plain at Lenggo Bay and is bounded to the east by the low-lying hilly terrain of Doro Sagala. Three new transmigration settlements have been established along the coastal area, northwest of Piong village. The rock layers underlying Piong village may be differentiated into two rock-layer units.

Results of Electric Resistivity Survey (Desa Piong)

Rock layer unit	Resistivity value	Lithology
I	> 10 Ωm	Tuffaceous sand with intercalated breccia
II	< 10 Ωm	Fine tuff, clay

4.5.5 Desa Kawuwu (NTB #18)

Desa Kawuwu occupies a broad river valley which is bounded on both sides by mountainous terrain composed of Tertiary volcanic rocks. This valley, drained by a permanent river, is covered with alluvial deposits consisting of clay, sand and gravel. The Tertiary volcanic terrain consists of dacitic tuff consisting of intercalation of tuff and tuffaceous sandstone. Local intercalation of lava and breccia occurs. The rock sequence may be divided into the following units.

Results of Electric Resistivity Survey (Desa Kawuwu)

Rock layer unit	Resistivity value	Lithology
I	10 - 20 Ω m	Gravel, sand and clay (alluvial deposits)
II	20 - 80 Ω m	Tuff sand stone with breccia intercalation
III	> 100 Ω m	Volcanic breccia

4.5.6 Desa Ranggo (NTB #19)

Desa Ranggo is located in a hilly volcanic terrain at an elevation between 50 – 150 m.asl. The village is drained by the river Sari Nata, a tributary of the main river Sari Depa. The northern part of the village has been developed with irrigated rice fields. New settlements have grown up along the main road connecting Rasabuo to the city of Dompu. The Tertiary volcanic deposits underlying Desa Ranggo are comprised mainly of tuff, tuffaceous sand and volcanic breccia. The following rock layer units are distinguished.

Results of Electric Resistivity Survey (Desa Ranggo)

Rock layer unit	Resistivity value	Lithology
I	< 10 Ω m	Clay tuff, tuff
II	10 - 35 Ω m	Tuffaceous sand with inter-bedded breccia
III	> 35 Ω m	Volcanic breccia with intercalated tuff sand

4.5.7 Desa Jambu (NTB #20)

Desa Jambu is located near the mouth of the Sari Depa River, Water supply to Desa Jambu is a most serious problem. This village is situated in a river valley, some 2.0 km wide, bounded towards the north and south by hilly terrain attaining the height of about 230 m.asl. Sixteen survey points were located in Desa Jambu.

The rock sequence underlying Jambu village may be divided into the following units based on the different values of their resistivity.

Results of Electric Resistivity Survey (Desa Jambu)

Rock layer unit	Resistivity value	Lithology
I	5 - 25 Ω m	Clay, sand gravel of alluvial deposits
II	< 10 Ω m	Clay, silt, sandy clay
III	10 - 30 Ω m	Reef limestone

1) Desa Cempi Jaya (Adjacent Village)

The lithology underlying this village is composed of inter-bedded clayey and limestone layers, which are underlain by a high electric resistance rock inferred as being volcanic breccia.

Within this village four deep wells were constructed for the Sumbawa Groundwater Irrigation Project. All of these wells penetrated coral reef limestone layers down to a depth of 60 m. This limestone is considered to be a part of an uplifted coral reef, which can be correlated with the well-exposed coral reef in Piong. This limestone serves as a good aquifer in the drilled wells in Cempi Jaya, which hopefully extends into Desa Jambu.

4.6 Flores Island

In the island of Flores, six villages were selected as locations for Electric Resistivity Surveys.

4.6.1 Desa Mekendatung (NTT #4)

Desa Mekendatung is located on the upper slope of Mt. Jele, volcanic terrain at an elevation between 300 – 600 m.asl. The village lies on volcanic materials which form rugged ridges having steep slopes with dry valleys on both sides. The village is situated on the upper part of the main watershed of Flores Island. Water resources are therefore scarce. With the exception of Dusun Magelahan, and Nitun, which are located in the surrounding river valleys, most Dusun such as Detung, Ojan and Wolo'ao are located on the rugged volcanic ridges at an elevation of more than 400 m.asl. The interpreted sequence of volcanic materials underlying Mekendatung village is as follows.

Results of Electric Resistivity Survey (Desa Mekendatung)

Rock layer unit	Resistivity value	Lithology
I	> 2000 Ω m	Volcanic breccia
II	< 2000 Ω m	Tuffaceous sand

4.6.2 Desa Sinar Hading (NTT #6)

Desa Sinar Hading is located along the shoreline road connecting Dusun Risapedung in the south and Dusun Werang in the north. A road connecting this village and the neighboring Desa Painapang runs through the junction of the lower foot-slopes of Mt. Ile Kadekareka and Mt. Ile Waikerewak. The interpreted volcanic products underlying Desa Sinar Hading are comprised mainly of volcanic breccia, tuffaceous sand and inter-bedded lava.

Results of Electric Resistivity Survey (Sinar Hading)

Rock layer unit	Resistivity value	Lithology
I	< 15 Ω m	Clay, silty clay
II	15 - 50 Ω m	Tuffaceous sand
III	50 - 200 Ω m	Tuffaceous breccia
IV	> 200 Ω m	Lava and breccia

4.6.3 Desa Ile Padung (NTT #7)

Desa Ile Padung is situated alongside Desa Sinar Hading on the shore line road. It occupies the lowest foot slopes of the extinct Ile Padung volcano. The volcanic rocks underlying Ile Padung village can be differentiated into three units.

Results of Electric Resistivity Survey (Desa Ile Padung)

Rock layer unit	Resistivity value	Lithology
I	< 15 Ω m	Tuffaceous sand
II	16 - 50 Ω m	Tuffaceous sand
III	> 50 Ω m	Tuff and breccia

4.6.4 Desa Watuliwung (NTT #15)

Desa Watuliwung occupies the northern volcanic foot slope of Mt. Jele (\pm 850 m) in an elongated shape stretching from the shore line up to an elevation of about 350 m.asl. Dusun Watuliwung (\pm 100 m) and Wetakera (\pm 200 m) are located on a volcanic ridge running south-north, bounded by the dry river valleys of Weir

Hubun and Napin Nubaharat on both sides. The volcanic material underlying Desa Watuliwung is divided into the following layer units.

Results of Electric Resistivity Survey (Desa Watuliwung)

Rock layer unit	Resistivity value	Lithology
I	20 – 1000 Ω m	Top soil and dry layer
II	20 – 120 Ω m	Gravel, sand and tuffaceous sand
III	< 20 Ω m	Tuff, tuffaceous clay

4.6.5 Desa Hepang (NTT #13)

Desa Hepang is situated on the southern coast of Flores Island. It is located on the lower volcanic slopes of Mt. Kimangbuleng (\pm 1,440 m) at an elevation rising from sea level up to 300 m.asl. Dusun Hepang occupies the small valley of the Nanga Lite River, which runs southwards to the coast. The origin of this river is located on the eastern slope of the Mt. Kimangbuleng volcano.

The lithology is composed of volcanic rocks, the result of the volcanic activities of Mt. Kimangbuleng. The following lithologic layer units may be subdivided.

Results of Electric Resistivity Survey (Desa Hepang)

Rock layer unit	Resistivity value	Lithology
I	> 200 Ω m	Tuffaceous sand and volcanic breccia
II	20 - 80 Ω m	Tuffaceous sand
III	< 20 Ω m	Clayey tuff

The results of the electrical resistivity survey conducted in Dusun Wolora and Kotit, show that a dry layer is encountered at depths between 52 – 59 m in Dusun Wolora (measuring points Hp – 01 and Hp – 02) and at depths between 89 – 116 m (measuring points Hp – 03 and Hp – 04). Below those depths, water-bearing layers may occur, but the productivity is probably very poor.

4.6.6 Desa Bloro (NTT #14)

Similar to Desa Hepang, Desa Bloro is located on the foot slope of the Kemangbulang volcano at elevations between 250 – 600 m.asl. Locally, it occupies a sloping volcanic ridge, which is bounded by the rivers of Wair Doik and Wair Metumeng on both sides. Within the village settlements are located astride the main road running along this ridge. They are Dusun Kaligator, Wukoh

and Key. The volcanic rocks underlying Desa Bloro can be subdivided into two rock-layer units.

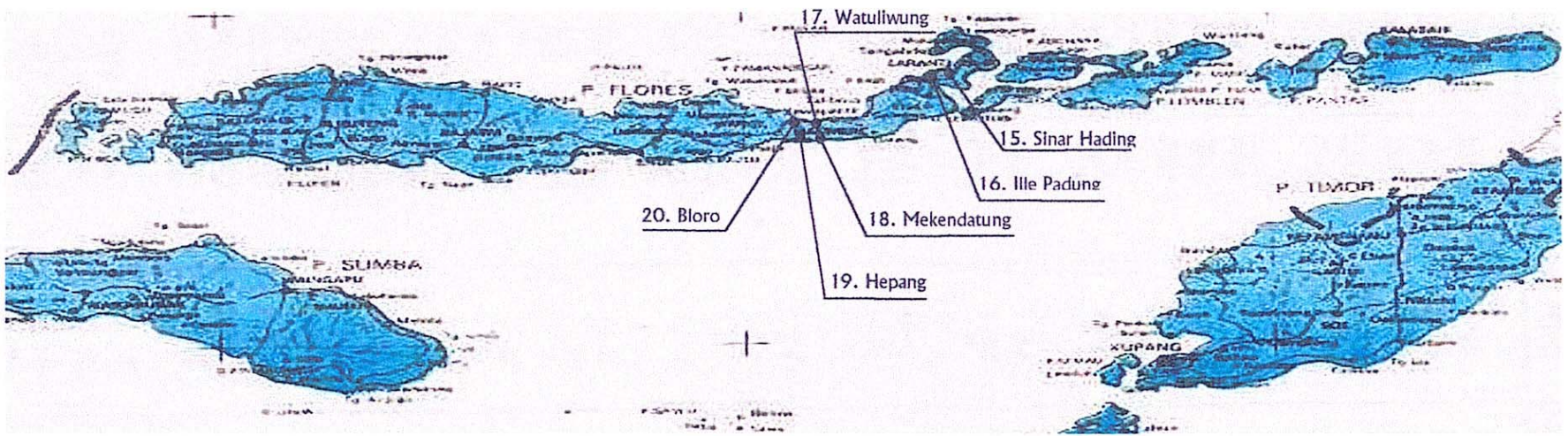
Results of Electric Resistivity Survey (Desa Bloro)

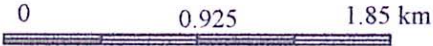
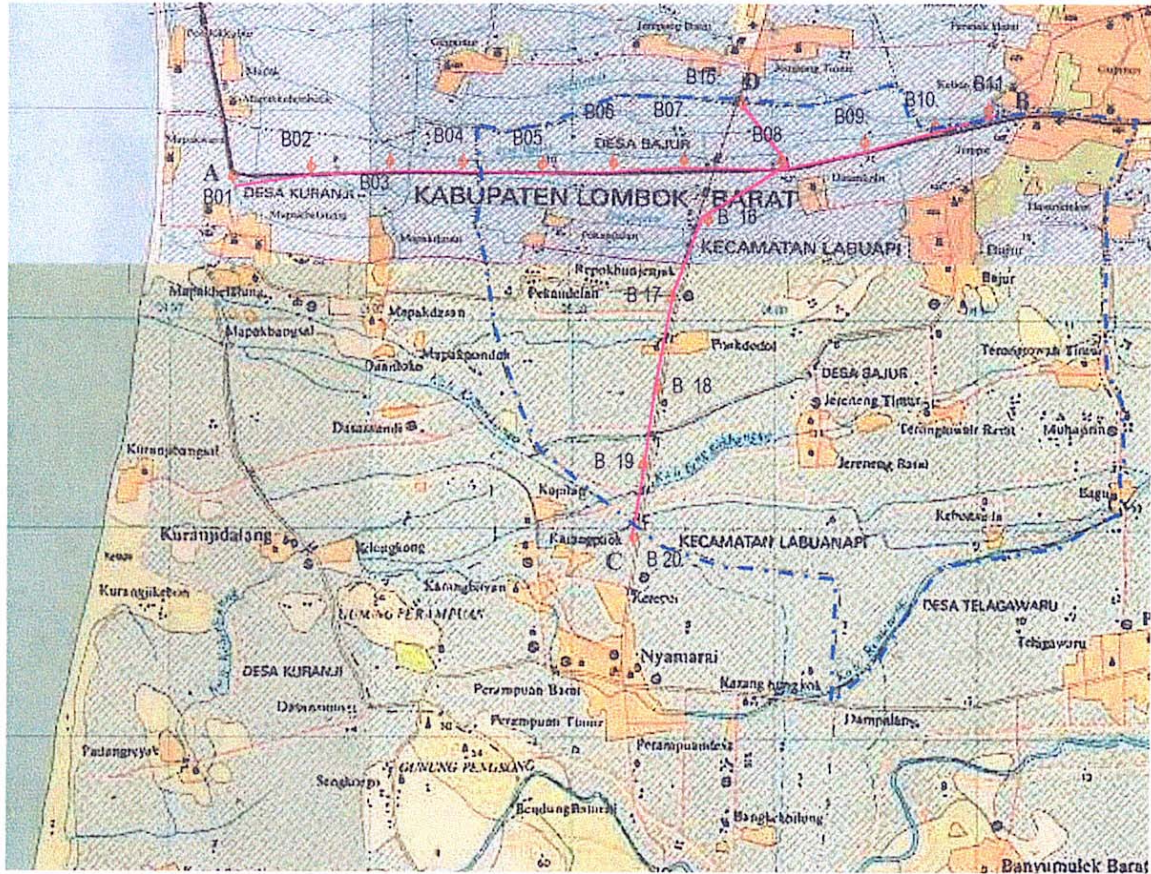
Rock layer unit	Resistivity value	Lithology
I	> 130 Ω m	Volcanic breccia
II	15 - 130 Ω m	Tuffaceous sand

WEST NUSA TENGGARA



EAST NUSA TENGGARA

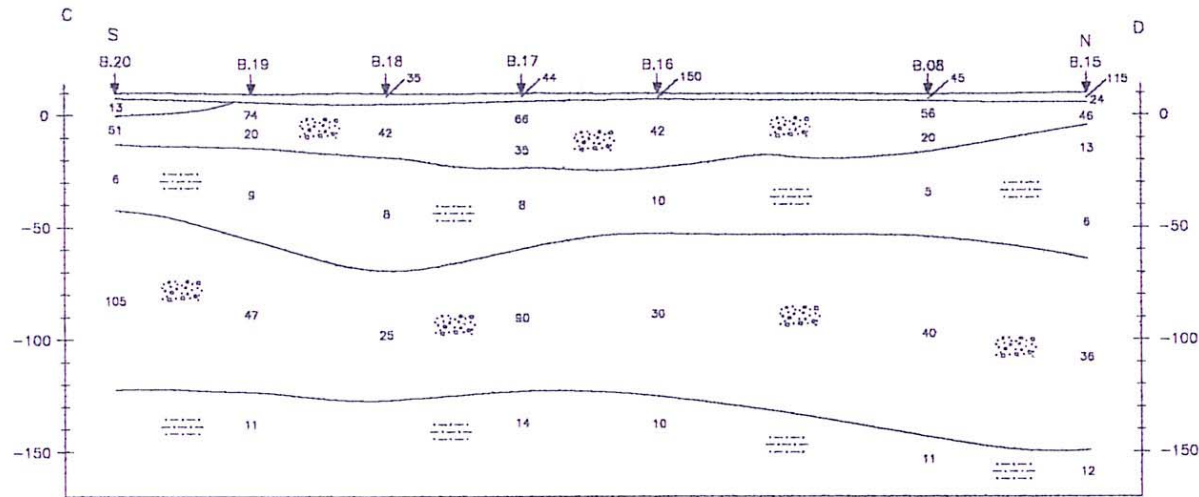
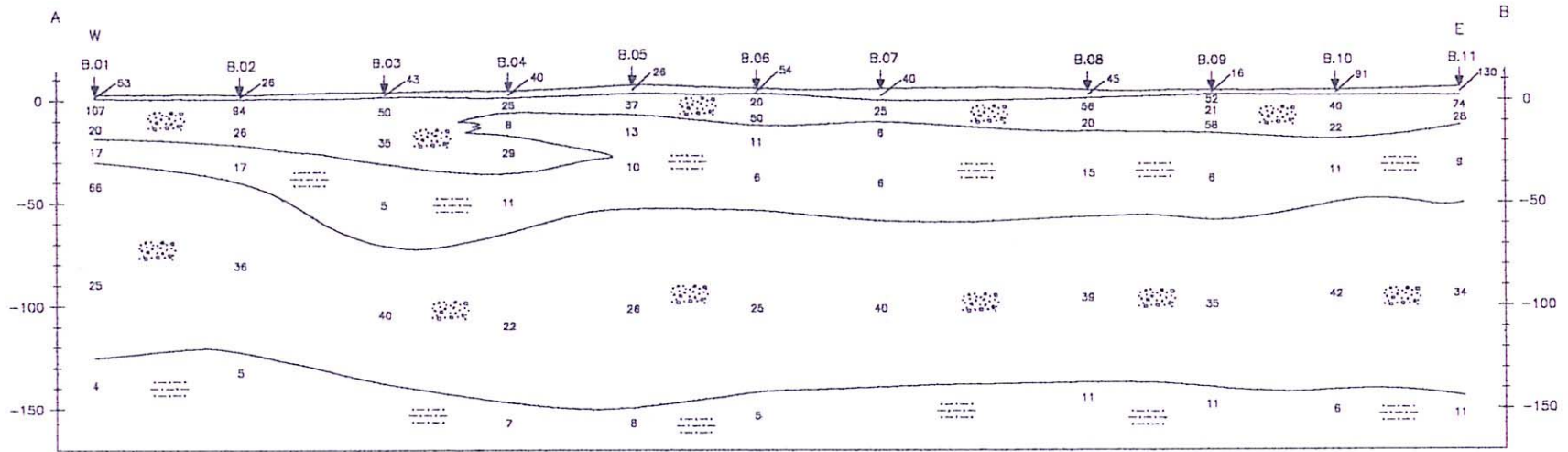




LEGEND :

- φ B02 Vertical Electric Sounding
- A — B Resistivity Cross Section
- ⊕ Drilled Well
- Dug Well
- * Spring
- - - - Village Boundary





<p>The Study on Rural Water Supply Project in Nusa Tenggara Barat and Nusa Tenggara Timur Japan International Cooperation Agency</p>	<p>Appendix 4.2 Electoric Sounding Survey Location Map - Desa Bajur (NTB#2)</p>
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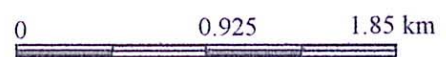
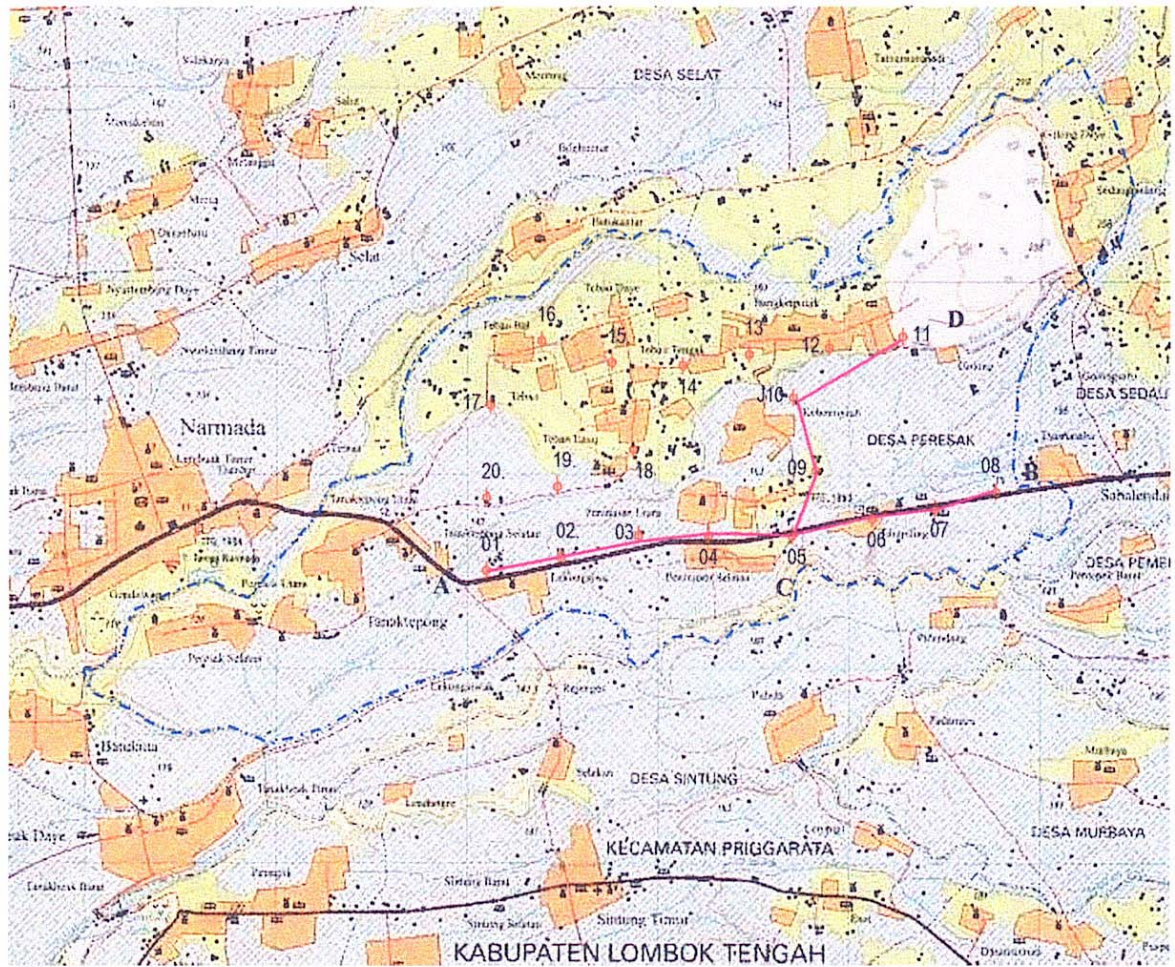


RESISTIVITY CROSS SECTION A-B & C-D
DESA BAJUR, KEC. LABUAPI
LOMBOK BARAT

0 100 500 m

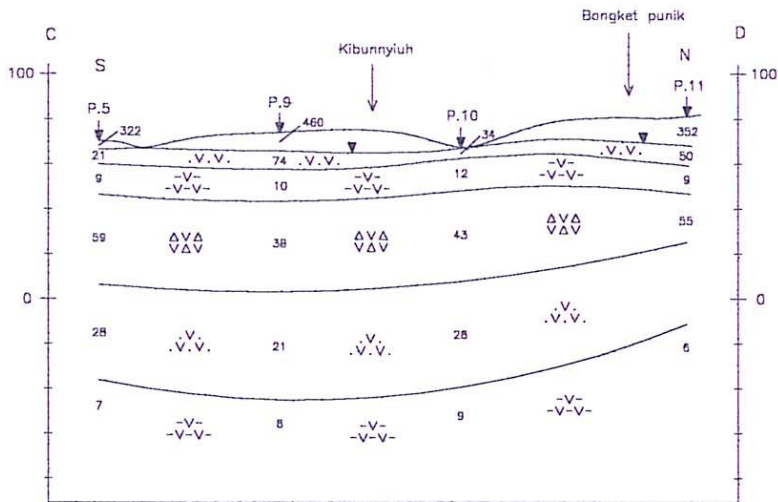
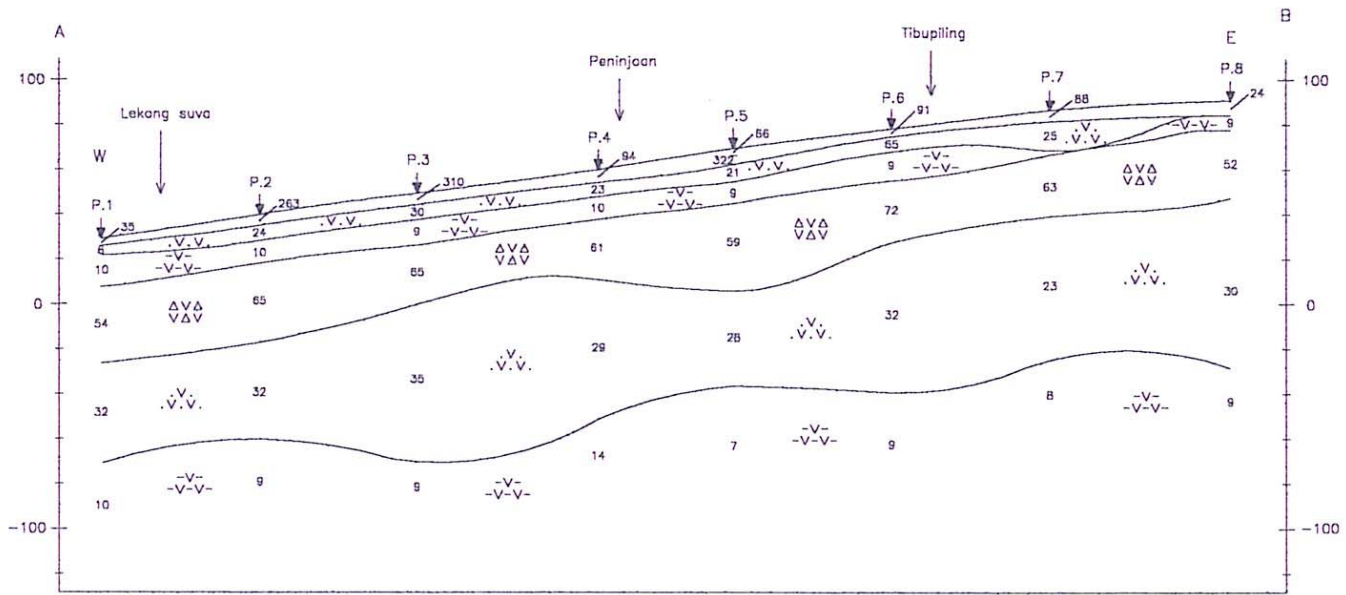
LEGEND

-  Top Soil and dry layer
-  >20 Ohm-meter, sand, gravel
Tuffaceous sand (aquifer) with
Clay intercalation
-  <20 Ohm-meter, clay, silt,
Sandy clay (aquiclude)
-  Sounding Point



- LEGEND :**
- φ 12 Vertical Electric Sounding
 - A B Resistivity Cross Section
 - ⊕ Drilled Well
 - Dug Well
 - ★ Spring
 - - - - Village Boundary

<p>The Study on Rural Water Supply Project in Nusa Tenggara Barat and Nusa Tenggara Timur Japan International Cooperation Agency</p>	<p>Appendix 4.4 Electoric Sounding Survey Location Map - Desa Peresak (NTB #5)</p>
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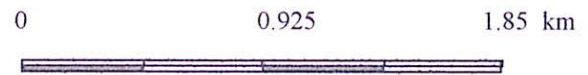


RESISTIVITY CROSS SECTION A-B & C-D
DESA PERESAK, KEC. NARMADA
LOMBOK BARAT

0 100 500 m

LEGEND

- Top Soil
- V-
-V- <20 Ohm-meter
Finetuff, clay, silt
- .V.
.V. 20-35 Ohm-meter
Tuffaceous sand
with intercalated breccia
- ΔVΔ
VΔV >35 Ohm-meter
Tuffaceous breccia with
Tuffaceous sand intercalation
- ↓ Sounding Point
- ▽- Phreatic water level



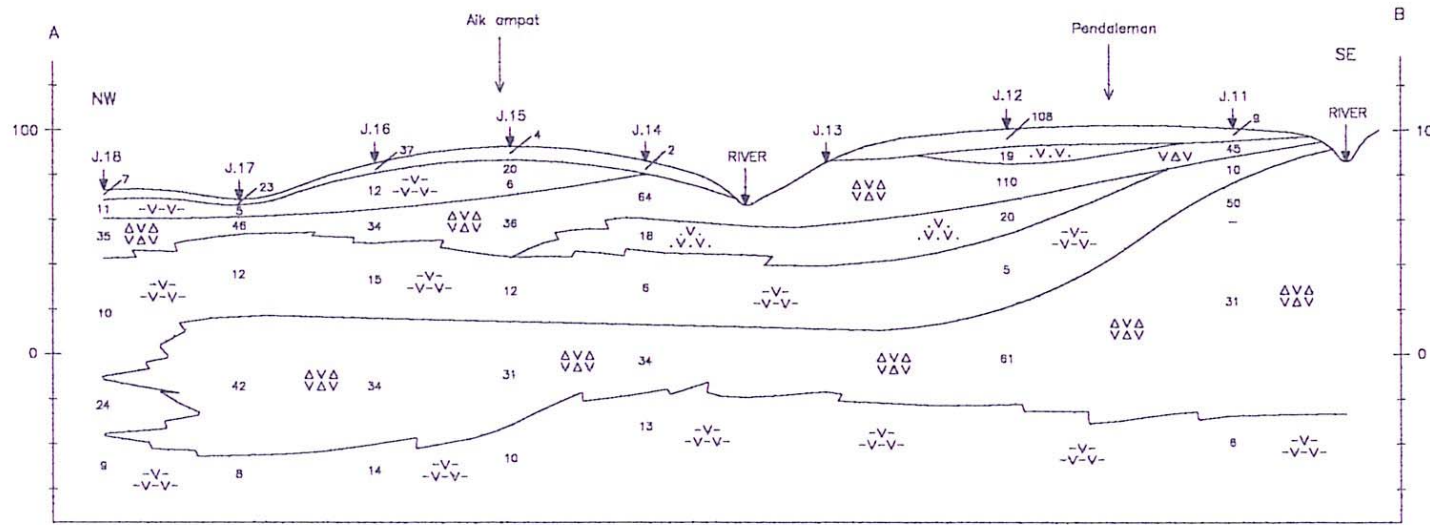
LEGEND :

- φ B02 Vertical Electric Sounding
- A B Resistivity Cross Section
- ⊕ Drilled Well
- Dug Well
- ★ Spring
- - - - Village Boundary

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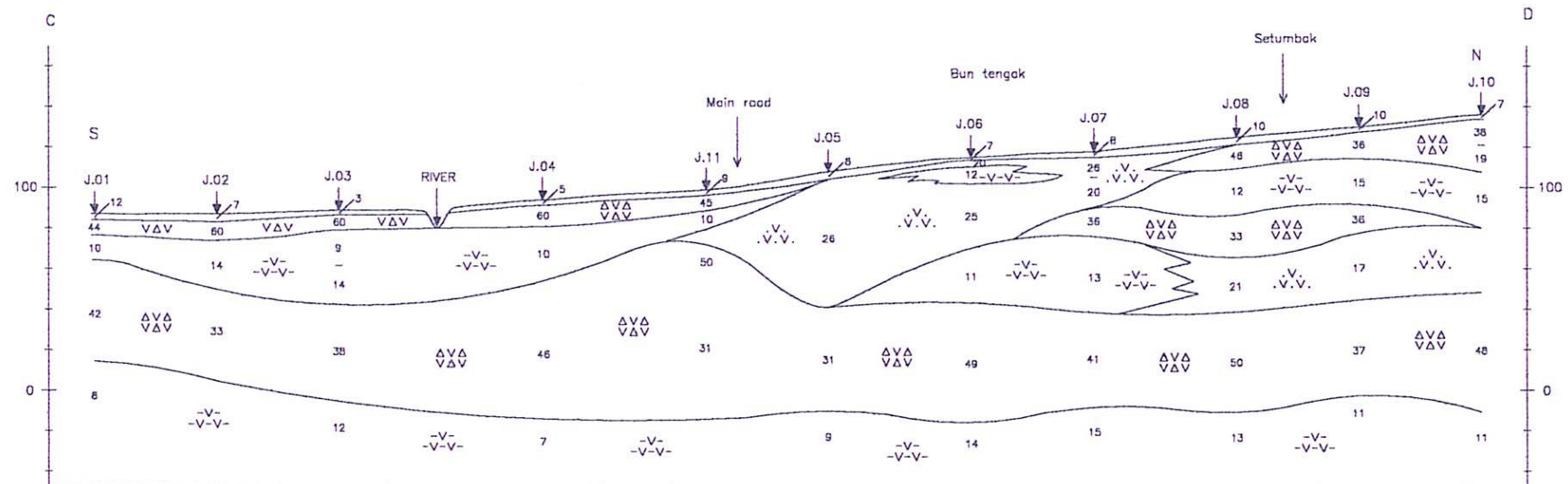
Appendix 4.6 Electric Sounding Survey
Location Map - Desa Jelantik (NTB #6)

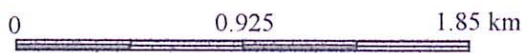
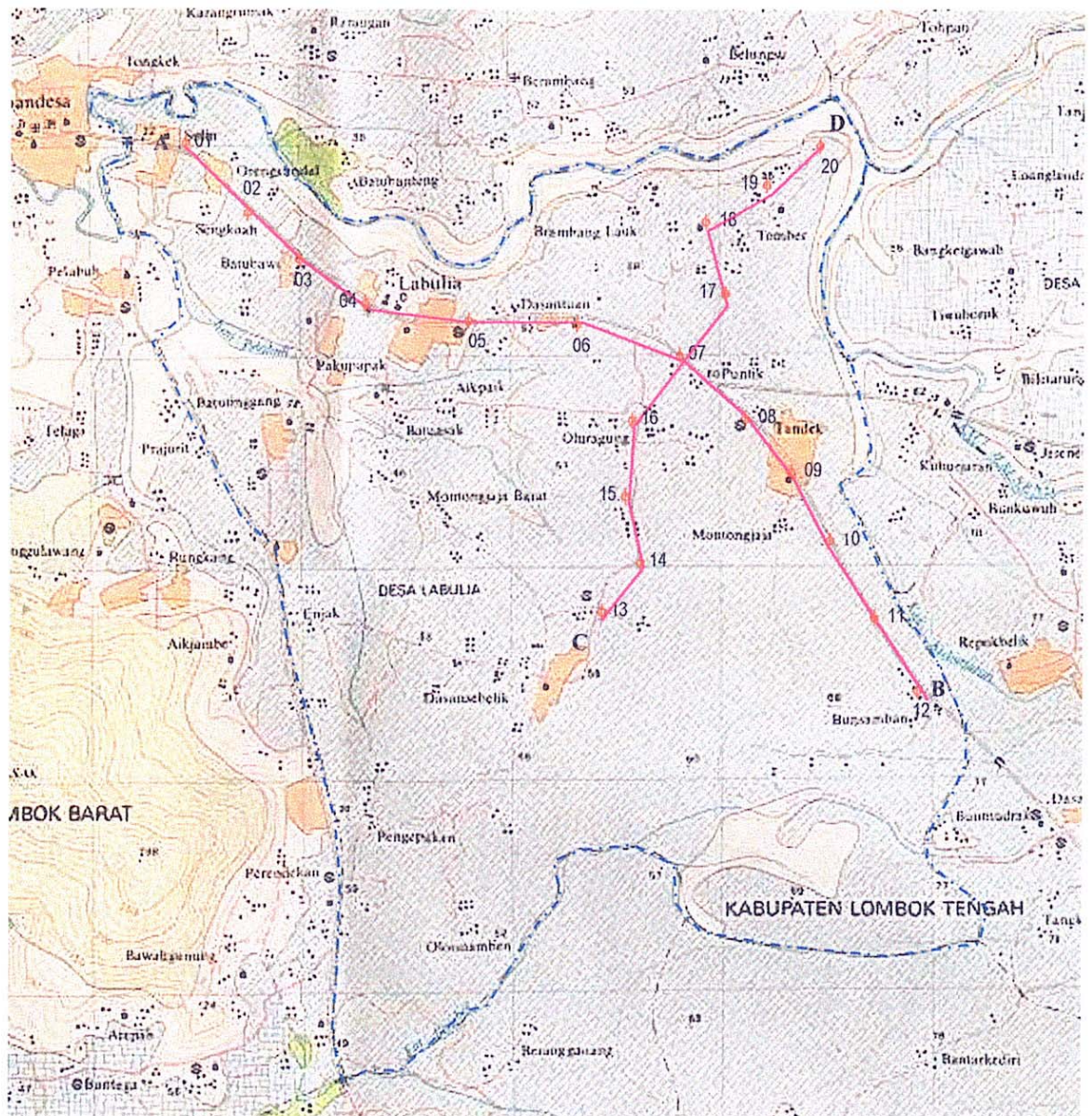
RESISTIVITY CROSS SECTION
 A-B & C-D
 DS. JELANTIK, KEC. JONGGAT
 LOMBOK TENGAH



LEGEND

- Top Soil
- <15 Ohm-meter
Clay, silt, tuffaceous clay
- 15-30 Ohm-meter
Tuffaceous sand (aquifer)
with intercalated breccia
- >30 Ohm-meter
Tuffaceous breccia
- Sounding Point



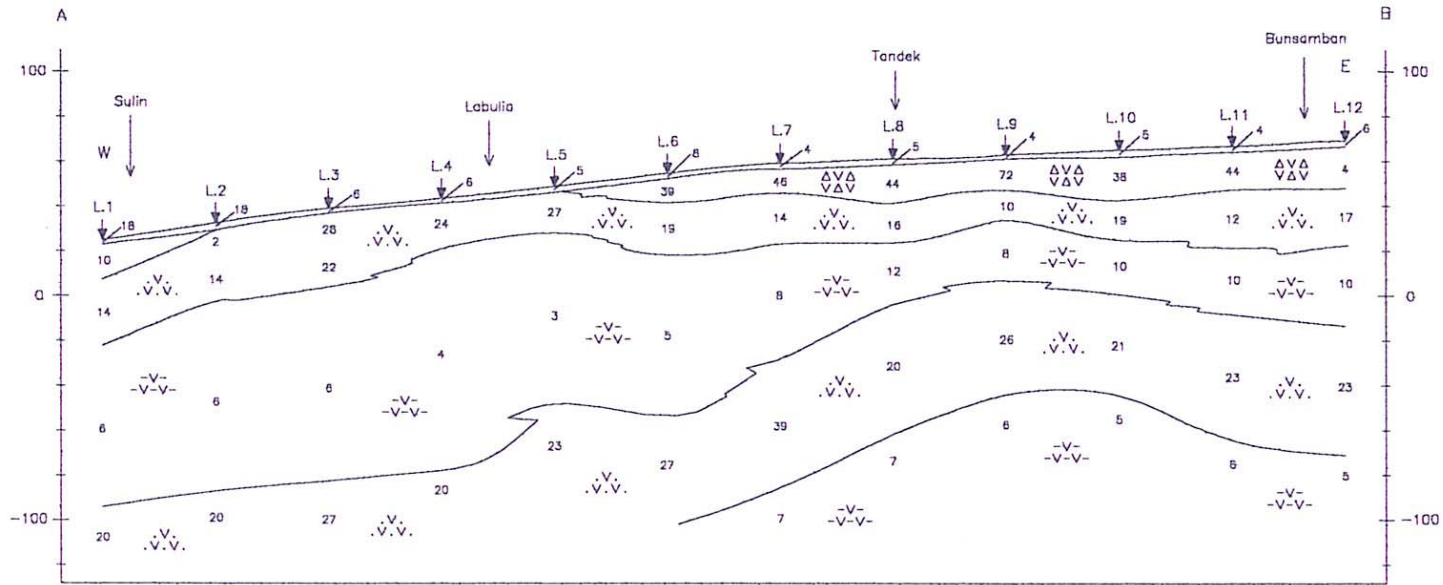


LEGEND :

- ϕ 12 Vertical Electric Sounding
- A B Resistivity Cross Section
- \oplus Drilled Well
- Dug Well
- * Spring
- - - - Village Boundary

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Appendix 4.8 Electric Sounding Survey
Location Map - Desa Labulia (NTB #7)

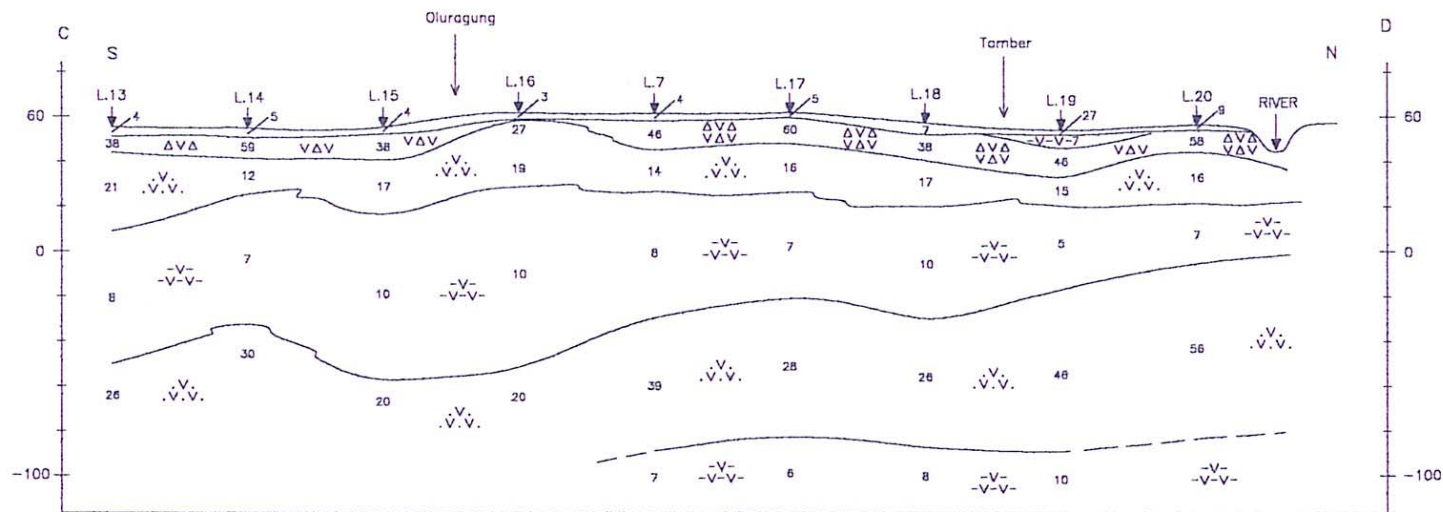


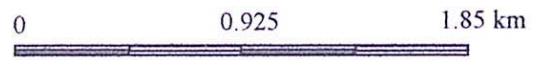
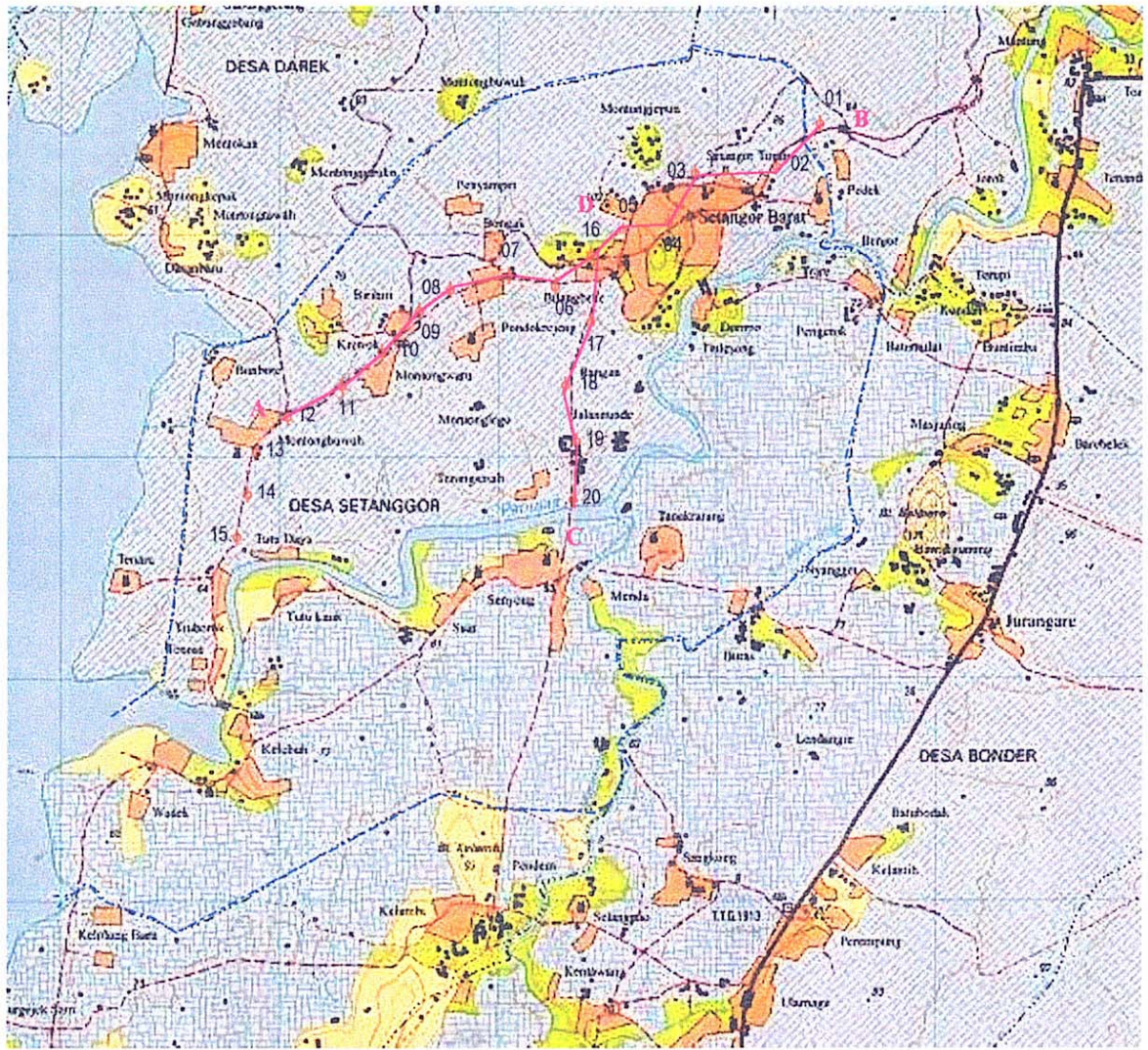
RESISTIVITY CROSS SECTION
A-B & C-D
DESA LABULIA, KEC. JONGGAT
LOMBOK TENGAH



LEGEND

- Top Soil
- <10 Ohm-meter
Clay, silt, tuffaceous clay
- 10-35 Ohm-meter
Tuffaceous sand (aquifer)
with intercalated breccia
- >35 Ohm-meter
Tuffaceous breccia
- Sounding Point





LEGEND :

- ϕ 12 Vertical Electric Sounding
- A B Resistivity Cross Section
- \oplus Drilled Well
- Dug Well
- * Spring
- - - - Village Boundary

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Appendix 4.10 Electric Sounding Survey
Location Map - Desa Setanggor (NTB #8)