

DATA-G
ENVIRONMENTAL STUDY

1. Supplementary Information on Existing Natural Environmental Condition

(1) Air Quality

RESULT OF AIR QUALITY MEASUREMENT

No.	Location	Parameter / Measured Data			
		CO ($\mu\text{g}/\text{Nm}^3$)	SO ₂ ($\mu\text{g}/\text{Nm}^3$)	NO ₂ ($\mu\text{g}/\text{Nm}^3$)	Dust ($\mu\text{g}/\text{Nm}^3$)
1.	Buliide	< 3,500	< 10	< 25	226
2.	Tenilo	< 3,500	< 10	< 25	255
3.	Pilolodaa	< 3,500	< 10	< 25	262
4.	Lekobalo	< 3,500	< 10	< 25	256
5.	Donggala	< 3,500	< 10	< 25	224
6.	Biawu	< 3,500	< 10	< 25	218
7.	Siendeng	< 3,500	< 10	< 25	228
8.	Tenda	< 3,500	< 10	< 25	217
9.	Bugis	< 3,500	< 10	< 25	223
10.	Ipilo	< 3,500	< 10	< 25	248
11.	Talumolo	< 3,500	< 10	< 25	206
12.	Tilote	< 3,500	< 10	< 25	223
13.	Tabumela	< 3,500	< 10	< 25	236
14.	Tualango	< 3,500	< 10	< 25	246
15.	Ilomangga	< 3,500	< 10	< 25	262
16.	Hunggaluwa	< 3,500	< 10	< 25	232
17.	Oluhuta	< 3,500	< 10	< 25	216
18.	Poowo	< 3,500	< 10	< 25	202
	Minimum	< 3,500	< 10	< 25	202
	Maximum	< 3,500	< 10	< 25	262
	Average	< 3,500	< 10	< 25	232
	Quality Standard*	30,000	900	400	230

* : Government Regulation No .82 / 2001.

Source: Field investigation in the course of this study, conducted from 4th through 7th in June, 2002.

(2) Noise

RESULT OF ENVIRONMENTAL NOISE MEASUREMENT

No.	Location	Noise Level (dB(A))
1.	Buliide	44.8 – 55.1
2.	Tenilo	44.1 – 49.7
3.	Pilolodaa	52.9 – 58.7
4.	Lekobalo	51.3 – 59.5
5.	Donggala	49.1 – 54.5
6.	Biawu	50.3 – 57.8
7.	Siendeng	52.3 – 57.1
8.	Tenda	52.2 – 58.9
9.	Bugis	54.9 – 59.4
10.	Ipilo	49.8 – 57.6
11.	Talumolo	49.3 – 59.7
12.	Tilote	47.7 – 54.6
13.	Tabumela	49.3 – 53.7
14.	Tualango	46.5 – 54.7
15.	Ilomangga	48.3 – 57.4
16.	Hunggaluwa	49.4 – 55.7
17.	Oluhuta	44.9 – 55.0
18.	Poowo	44.3 – 55.1
Minimum – Maximum		44.1 – 59.7
Average		52.7
Quality Standard*		55

* : Government Regulation No .82 / 2001.

Source: Field investigation in the course of this study, conducted from 4th through 7th in June, 2002.

(3) Water Quality

RESULT OF WATER QUALITY MEASUREMENT CONDUCTED IN JUNE, 2002

No	Parameter	Unit	Sampling Location												
			A ₁	A ₂	A ₃	A ₄	A ₅	A ₆	A ₇	A ₈	A ₉	A ₁₀	A ₁₁	A ₁₂	A ₁₃
A. Physical															
1.	Temperature	°C	27.2	27.1	27.3	27.1	27.2	27.4	26.8	26.9	27.1	27.4	27.6	27.8	28.1
2.	TDS	mg/l	345	293	179	182	183	148	262	179	191	358	184	217	53260
3.	TSS	mg/l	3	9	4	12	11	4	15	6	4	19	14	4	4
4.	Turbidity	NTU	2.7	12.5	6.6	15.5	12.8	4.1	19.6	11.7	8.3	29.4	17.3	5.8	3.7
B. Inorganic chemicals															
5.	pH	-	7.1	6.9	6.6	7.0	7.0	7.2	7.0	6.8	7.0	6.9	7.0	7.3	7.9
6.	BOD	mg/l	18.09	27.44	23.23	36.09	32.06	36.09	19.09	27.44	25.33	17.09	32.06	27.44	13.06
7.	COD	mg/l	21	42	36	51	45	46	25	44	38	20	43	39	20
8.	DO	mg/l	6.2	6.0	6.1	6.1	5.8	5.7	6.1	6.2	6.1	6.0	6.3	5.8	6.0
9.	Phosphate (P)	mg/l	0.0065	0.0065	0.0088	0.0095	0.0095	0.0212	0.0196	0.0082	0.0085	0.0095	0.0163	0.0130	0.0117
10.	NO ₃ -N	mg/l	1.29	1.41	1.46	1.43	1.53	1.53	1.08	1.46	1.35	1.47	1.48	1.51	1.04
11.	NO ₂ -N	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	0.04	<0.01	<0.01	<0.01
12.	Arsenic (As)	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.018	<0.002	<0.002	<0.002	0.040	0.058
13.	Cobalt (Co)	mg/l	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
14.	Boron (B)	mg/l	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.	Selenium (Se)	mg/l	0.008	0.006	0.006	0.008	0.006	0.006	0.01	0.01	0.01	0.006	<0.005	0.011	0.011
16.	Cadmium (Cd)	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
17.	Chromium (Cr ⁶⁺)	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
18.	Copper (Cu)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
19.	Lead (Pb)	mg/l	<0.05	<0.05	<0.05	<0.05	0.13	0.13	0.20	0.08	0.12	0.19	0.20	0.14	0.14
20.	Mercury (Hg)	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0118	0.0009	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
21.	Zink (Zn)	Mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Legend :

A₁ : Lower Alo-Pohu A₅ : Upper Topadu (Near Bolango) A₉ : Limboto lake near Pilolodaa outlet A₁₃ : Teluk Tomini (Pelabuhan)
A₂ : Lower Biyonga A₆ : Lower Bone A₁₀ : Limboto lake (Alo-Pohu inlet)
A₃ : Lower Bolango (Desa Tenda) A₇ : Upper Tamalate A₁₁ : Limboto lake (Biyonga inlet)
A₄ : Upper Topadu (Outlet of lake) A₈ : Limboto lake at floating net A₁₂ : Bone/Biyonga confluence

Source: Field investigation in the course of this study, conducted from 4th through 6th of June, 2002.

(4) Terrestrial flora

a. Forest and Shrub lands: Forest and shrub lands were analyzed using a quadrant analysis placing along but outside the project sites. The number of plot samplings of each vegetation type was 100, and 20-meter space interval between samplings was set up.

Quadrant method: Each indicator hereunder was calculated based on the following formula:

$$\text{Total Species Density} = \frac{\text{Area (ha)}}{(0,8 \text{ d})^2}$$

$$\text{Species Density} = \frac{\text{Relative species density}}{100} \times \text{total species density}$$

$$\text{Relative species density (KR)} = \frac{\text{The number of individuals of one species}}{\text{Total number of species}} \times 100 \%$$

$$\text{Species domination} = \frac{\text{Total area occupied by one species}}{\text{Total area}}$$

$$\text{Relative Domination (DR)} = \frac{\text{Species domination}}{\text{Total species domination}} \times 100 \%$$

$$\text{Species Frequency} = \frac{\text{The number of sampling sites where the species was found}}{\text{Total number of sampling sites}}$$

$$\text{Species relative frequency (FR)} = \frac{\text{Species frequency}}{\text{Total species frequency}} \times 100 \%$$

$$\text{Important value index} = \text{KR} + \text{DR} + \text{FR}$$

b. Grass and Herbaceous Plant Vegetation: Line intercept method was employed to collect grass and herbaceous plants vegetation data. Species abundance was calculated using the following frequency formula:

$$\text{Species frequency} = \frac{\text{The number of sampling sites where the species was found}}{\text{The number of sampling sites}}$$

$$\text{Relative frequency} = \frac{\text{Frequency value of one species}}{\text{Total frequency value of all species}} \times 100\%$$

1) Forest land

RESULT OF QUADRANT ANALYSIS AT AYUMOLINOGGO PROTECTED FOREST (1/3)

No.	Common name (Scientific name)	Number recorded	Species Domination	Species Density	Species Frequency	Relative Domination	Relative Density	Relative Frequency	Important Value Index
1.	Bata	348	0.7867	6.9600	1.0000	7.1996	11.1289	3.9002	22.2287
2.	Bitaula (<i>Calophyllum soulatri</i>)	322	0.6674	6.4400	1.0000	6.1082	10.2974	3.9002	20.3058
3.	Pilohibuta (<i>Eugenia</i> sp.)	240	0.7043	4.8000	0.9200	6.4457	7.6751	3.5881	17.7089
4.	Dengilo (<i>Dillenia serrata</i>)	147	0.7694	2.9400	0.8400	7.0415	4.7010	3.2761	15.0186
5.	Biabo	164	0.5134	3.2800	0.9600	4.6987	5.2446	3.7441	13.6874
6.	Mix	141	0.5353	2.8200	0.8400	4.8988	4.5091	3.2761	12.6840
7.	Inengo (<i>Alseodaphne</i>)	72	0.4115	1.4400	0.6400	3.7663	2.3025	2.4961	8.5649
8.	Laluta (<i>Polyalthia rumphii</i>)	97	0.2511	1.9400	0.7400	2.2980	3.1020	2.8861	8.2861
9.	Dewu (<i>Dracontomelon dao</i>)	70	0.3458	1.4000	0.6200	3.1645	2.2386	2.4181	7.8212
10.	Longulo (<i>Heritiera littoralis</i>)	80	0.2233	1.6000	0.7600	2.0437	2.5584	2.9641	7.5662
11.	Tolotio (<i>Drypetes globosa</i>)	104	0.2715	2.0800	0.4000	2.4848	3.3259	1.5601	7.3708
12.	Dengilo maluo (<i>Dillenia ochreta</i>)	47	0.3777	0.9400	0.5400	3.4571	1.5030	2.1061	7.0662
13.	Tintibotu (<i>Alangium javanicum</i>)	74	0.2279	1.4800	0.6000	2.0856	2.3665	2.3401	6.7922
14.	Wulu (<i>Elmerrillia ovalis</i>)	35	0.4238	0.7000	0.4000	3.8789	1.1193	1.5601	6.5583
15.	Lojo (<i>Dracontomelon mangiferum</i>)	62	0.1988	1.2400	0.7000	1.8194	1.9827	2.7301	6.5322
16.	Moobi (<i>Xylopia</i>)	70	0.1576	1.4000	0.7200	1.4427	2.2386	2.8081	6.4894
17.	Tulawota (<i>Vitex quinata</i>)	67	0.1383	1.3400	0.7600	1.2655	2.1426	2.9641	6.3722
18.	Binggele	33	0.3476	0.6600	0.4200	3.1808	1.0553	1.6381	5.8742
19.	Alama (<i>Shorea</i> spp)	48	0.1667	0.9600	0.7000	1.5261	1.5350	2.7301	5.7912
20.	Tebelewonu	56	0.1250	1.1200	0.6400	1.1436	1.7909	2.4961	5.4306
21.	Wontami (<i>Diosphyros pilosantera</i>)	46	0.2025	0.9200	0.5000	1.8528	1.4711	1.9501	5.2740
22.	Politidi	35	0.2225	0.7000	0.5000	2.0364	1.1193	1.9501	5.1058
23.	Mombi	59	0.1737	1.1800	0.4000	1.5899	1.8868	1.5601	5.0368
24.	Ilota (<i>Myristica</i>)	52	0.1251	1.0400	0.5400	1.1447	1.6629	2.1061	4.9137
25.	Butungale (<i>Aglaia</i> sp.)	39	0.2099	0.7800	0.3800	1.9209	1.2472	1.4821	4.6502
26.	Lantolo (<i>Eugenia</i> sp.)	30	0.1663	0.6000	0.5200	1.5216	0.9594	2.0281	4.5091
27.	Bitu (<i>Calophyllum waworoentii</i>)	42	0.1313	0.8400	0.5000	1.2019	1.3431	1.9501	4.4951
28.	Lotoo (<i>Madhuca philipinensis</i>)	33	0.1746	0.6600	0.4400	1.5983	1.0553	1.7161	4.3697
29.	Boyuhu (<i>Pterospermum celebicum</i>)	39	0.0988	0.7800	0.4200	0.9038	1.2472	1.6381	3.7891
30.	Molonggoile (<i>Radermachera</i> sp.)	31	0.0698	0.6200	0.4200	0.6385	0.9914	1.6381	3.2680

Source: Field investigation in the course of this study, conducted from 2nd through 6th of June, 2002.

RESULTS OF QUADRANT ANALYSIS AT AYUMOLINOGGO PROTECTED FOREST (2/3)

No.	Common name (Scientific name)	Number recorded	Species Domination	Species Density	Species Frequency	Relative Domination	Relative Density	Relative Frequency	Important Value Index
31.	Tapalu (<i>Planchonia valida</i>)	24	0.1503	0.4800	0.2800	1.3756	0.7675	1.0920	3.2351
32.	Pomia	29	0.0652	0.5800	0.4200	0.5963	0.9274	1.6381	3.1618
33.	Lea	16	0.1000	0.3200	0.2600	0.9156	0.5117	0.0140	1.4413
34.	Pongapuhu (<i>Diospyros malabarica</i>)	21	0.0599	0.4200	0.3000	0.5479	0.6716	1.1700	2.3895
35.	Bintento	21	0.0556	0.4200	0.3000	0.5089	0.6716	1.1700	2.3505
36.	Labanu (<i>Neonaucle</i> sp)	10	0.1472	0.2000	0.1600	1.3475	0.3198	0.6240	2.2913
37.	Molotingo (<i>Spondias pinnata</i>)	16	0.0571	0.3200	0.3200	0.5229	0.5117	1.2480	2.2826
38.	Biluango	15	0.1111	0.3000	0.1800	1.0165	0.4797	0.7020	2.1982
39.	Wumbalango (<i>Barringtonia</i> sp.)	15	0.0929	0.3000	0.1800	0.8505	0.4797	0.7020	2.0322
40.	Bolangita	9	0.1170	0.1800	0.1400	0.0706	0.2878	0.5460	0.9044
41.	Latula	16	0.0263	0.3200	0.2600	0.2411	0.5117	1.0140	1.7668
42.	Dudepo	16	0.0335	0.3200	0.2400	0.3064	0.5117	0.9360	1.7541
43.	Kolakoa (<i>Baccaurea</i> sp.)	18	0.0272	0.3600	0.2000	0.2494	0.5756	0.7800	1.6050
44.	Upolodihe (<i>Eugenia</i> sp.)	14	0.0384	0.2800	0.2000	0.3512	0.4477	0.7800	1.5789
45.	Poobo (<i>Eugenia</i> sp.)	13	0.0348	0.2600	0.2000	0.3188	0.4157	0.7800	1.5145
46.	Nantu (<i>Palaquium obtusifolium</i>)	11	0.0408	0.2200	0.1600	0.3733	0.3518	0.6240	1.3491
47.	Pongoli (<i>Ailanthus integrifolia</i>)	12	0.0408	0.2400	0.1000	0.3731	0.3838	0.3900	1.1469
48.	Loto-loto dihe	8	0.0285	0.1600	0.1600	0.2611	0.2558	0.6240	1.1409
49.	Pobumengo (<i>Meliosma</i> sp.)	9	0.0186	0.1800	0.1600	0.1703	0.2878	0.6240	1.0821
50.	Duito (<i>Parinari corymbosa</i>)	7	0.0326	0.1400	0.1400	0.2988	0.2239	0.5460	1.0687
51.	Pangana (<i>Homonoia javensis</i>)	8	0.0286	0.1600	0.1400	0.2614	0.2558	0.5460	1.0632
52.	Melur	8	0.0153	0.1600	0.1600	0.1402	0.2558	0.6240	1.0200
53.	Mataputih (<i>Mollotus floribundus</i>)	13	0.0159	0.2600	0.0800	0.1453	0.4157	0.3120	0.8730
54.	Wompopale (<i>Glochidion</i> sp.)	7	0.0188	0.1400	0.1200	0.1722	0.2239	0.4680	0.8641
55.	Latula bawang	6	0.0256	0.1200	0.1000	0.2343	0.1919	0.3900	0.8162
56.	Momala (<i>Homalium foetidum</i>)	6	0.0156	0.1200	0.1200	0.1430	0.1919	0.4680	0.8029
57.	Hulumewu (<i>Artocarpus dasyphyllus</i>)	6	0.0122	0.1200	0.1200	0.1119	0.1919	0.4680	0.7718
58.	Bingkiladu (<i>Sterculia</i>)	2	0.0452	0.0400	0.0400	0.4137	0.0640	0.1560	0.6337
59.	Morsigo	5	0.0148	0.1000	0.0800	0.1355	0.1599	0.3120	0.6074
60.	Tohetutu	4	0.0177	0.0800	0.0800	0.1624	0.1279	0.3120	0.6023

Source: Field investigation in the course of this study, conducted from 2nd through 6th of June, 2002.

RESULTS OF QUADRANT ANALYSIS AT AYUMOLINOGGO PROTECTED FOREST (3/3)

No.	Common name (Scientific name)	Number recorded	Species Domination	Species Density	Species Frequency	Relative Domination	Relative Density	Relative Frequency	Important Value Index
61.	Walongo	5	0.0116	0.1000	0.0800	0.1062	0.1599	0.3120	0.5781
62.	Tapeo	5	0.115	0.1000	0.0800	0.1050	0.1599	0.3120	0.5769
63.	Bisau	5	0.0086	0.1000	0.0800	0.0789	0.1599	0.3120	0.5508
64.	Tombulilato	4	0.0099	0.0800	0.0800	0.0906	0.1279	0.3120	0.5305
65.	Bunga	3	0.0211	0.0600	0.0600	0.1927	0.0959	0.2340	0.5226
66.	Bulohu	4	0.0083	0.0800	0.0800	0.0762	0.1279	0.3120	0.5161
67.	Nantu Laut	5	0.0126	0.1000	0.0600	0.1156	0.1599	0.2340	0.5095
68.	Binggiladu	4	0.0055	0.0800	0.0800	0.0500	0.1279	0.3120	0.4899
69.	Bitaula Dihe	4	0.0049	0.0800	0.0800	0.0446	0.1279	0.3120	0.4845
70.	Gulupahe	3	0.0156	0.0600	0.0600	0.1431	0.0959	0.2340	0.4730
71.	Tilangita	4	0.0023	0.0800	0.0800	0.0208	0.1279	0.3120	0.4607
72.	Pangi (<i>Pangium edule</i>)	3	0.0130	0.0600	0.0600	0.1189	0.0959	0.2340	0.4488
73.	Pala Hutan	3	0.0117	0.0600	0.0600	0.1073	0.0959	0.2340	0.4372
74.	Molomehulo (<i>Neoscortechinia kingii</i>)	3	0.0084	0.0600	0.0600	0.0773	0.0959	0.2340	0.4072
75.	Molonggota	3	0.0079	0.0600	0.0600	0.0727	0.0959	0.2340	0.4026
76.	Laluta Dihe	3	0.0070	0.0600	0.0600	0.0640	0.0959	0.2340	0.3939
77.	Wubalango	2	0.0140	0.0400	0.0200	0.1283	0.0640	0.0780	0.2703
78.	Molopalapa	2	0.0043	0.0400	0.0400	0.0392	0.0640	0.1560	0.2592
79.	Nantu pulu	3	0.0062	0.0600	0.0200	0.0570	0.0959	0.0780	0.2309
80.	Tohupo	1	0.0072	0.0200	0.0200	0.0661	0.0320	0.0780	0.1761
81.	Jisawu	1	0.0064	0.0200	0.0200	0.0583	0.0320	0.0780	0.1683
82.	Duito moluo	1	0.0061	0.0200	0.0200	0.0554	0.0320	0.0780	0.1654
83.	Hilihuwa	1	0.0029	0.0200	0.0200	0.0262	0.0320	0.0780	0.1362
84.	Momali	1	0.0026	0.0200	0.0200	0.0242	0.0320	0.0780	0.1342
85.	Longulo Hutan	1	0.0026	0.0200	0.0200	0.0242	0.0320	0.0780	0.1342
86.	Loto-lotohia	1	0.0026	0.0200	0.0200	0.0239	0.0320	0.0780	0.1339
87.	Ngalaa	1	0.0020	0.0200	0.0200	0.0186	0.0320	0.0780	0.1286
88.	Nyatoh (<i>Palaquium</i> sp.)	1	0.0020	0.0200	0.0200	0.0186	0.0320	0.0780	0.1286
89.	Tanua (<i>Metrosideros petiolata</i>)	1	0.0012	0.0200	0.0200	0.0113	0.0320	0.0780	0.1213
90.	Lolajo	1	0.0012	0.0200	0.0200	0.0110	0.0320	0.0780	0.1210

Source: Field investigation in the course of this study, conducted from 2nd through 6th of June, 2002.

2) Bush land vegetation

RESULT OF FIELD INVESTIGATION ON BUSH LAND VEGETATION

No.	Common name (Indonesian name)	Scientific name	Species Domination
1.	Rumput Macan	<i>Lantana camara</i>	24.23
2.	Kayu Sirih	<i>Piper aduncum</i>	13.92
3.	-	<i>Amisomeles indic</i> L.	12.37
4.	-	<i>Paspalum conyugatum</i>	8.76
5.	-	<i>Convolvulus arvensis</i> L.	4.12
6.	-	<i>Macaranga sp.</i>	3.61
7.	-	<i>Kleinhofia hospita</i>	3.61
8.	Unidentiied	-	3.61
9.	Pepaya	<i>Carica papaya</i>	3.61
10.	-	<i>Emilia sonchifolia</i> DC.	3.09
11.	-	<i>Hyptis brevipes</i> Por.	3.09
12.	-	<i>Ageratum conycoiedes</i> L.	2.58
13.	Kano-kano	<i>Sacharum spontanum</i>	2.58
14.	-	<i>Diospiros sp.</i>	1.55
15.	Teki	-	1.55
16.	-	<i>Urena lobala</i> L.	1.55
17.	-	<i>Leucas lavandula</i>	1.03
18.	Poki-poki utang	<i>Solanum sp</i>	0.52
19.	-	<i>Centrosema pubescens</i>	0.52
20.	Nantu	<i>Palaquium sp.</i>	0.52
21.	Lubi	<i>Macaranga sp.</i>	0.52
22.	Tagalolo	<i>Ficus sp.</i>	0.52
23.	Nibong	<i>Pigafetta elata</i>	0.52
24.	Lasi	<i>Vitex sp</i>	0.52
25.	Lalawiran	-	0.52
26.	Beringin	<i>Ficus sp.</i>	0.52
27.	Bitaula	<i>Calophyllum soulatri</i>	0.52

Source: Field investigation in the course of this study, conducted from 7th through 8th of June, 2002.

3) Grass land vegetation

RESULT OF FIELD INVESTIGATION ON GRASS LAND VEGETATION

No.	Common name (Indonesian name)	Scientific name	Species Domination
1.	Alang-alang	<i>Imperata cylindrica</i>	53.85
2.	Mimosa	<i>Mimosa pudica</i>	15.65
3.	Ekor Tikus	-	9.02
4.	Rumput Sosapu	<i>Sida sp</i>	6.10
5.	-	<i>Hyptis brevipes</i> POUR	3.45
6.	-	<i>Savia molesta</i>	2.12
7.	-	<i>Blumea balsamifera</i> DC.	1.59
8.	Rumput Macan	<i>Lantana camara</i>	1.33
9.	-	<i>Paspalum conjugatum</i>	1.33
10.	-	<i>Passiflora foetida</i>	1.33
11.	-	<i>Ageratum conyzoides</i>	1.06
12.	Kayu Sirih	<i>Piper aduncum</i>	0.53
13.	-	<i>Chromolaena odorata</i>	0.53
14.	Tagalolo	<i>Ficux sp.</i>	0.27
15.	-	<i>Urena lobela</i>	0.27
16.	Terong Hutan	<i>Solanum sp.</i>	0.27
17.	Pakis Hutan	-	0.27
18.	-	<i>Macaranga sp.</i>	0.27
19.	-	<i>Colopogonium cerealeum</i>	0.27
20.	-	<i>Chromolaena odorata</i>	0.27
21.	-	<i>Momordica charantia</i> L.	0.27

Source: Field investigation in the course of this study, conducted from 7th through 8th of June, 2002.

4) Aquatic flora

RESULT OF INVENTORY OF AQUATIC VEGETATION

No.	Local name (Indonesian name)	Scientific name
1.	Alata (genjer)	<i>Limnocharis flava</i>
2.	Alata (eceng)	<i>Monochoria hastate</i>
3.	Bombang	<i>Hydrochloa sp.</i>
4.	Buanga	<i>Cyperus sp.</i>
5.	Dumalo	<i>Nayas sp.</i>
6.	-	<i>Ceratophyllum sp.</i>
7.	-	<i>Utricularia sp.</i>
8.	Iduk	<i>Ludwigia adscendens</i>
9.	Kangkung	<i>Ipomoea aquatica</i>
10.	Kayu Kelong	<i>Aeschynomene sp.</i>
11.	Kiambang	<i>Azolla pinnata</i>
12.	-	<i>Lemna sp.</i>
13.	Plambungo	<i>Ipomoea crassicaulis</i>
14.	Rumput	<i>Panicum sp.</i>
15.	-	<i>Scirpus sp.</i>
16.	-	<i>Leersia sp.</i>
17.	Teratai	<i>Nelumbium sp.</i>
18.	-	<i>Orellia alismoides</i>
19.	Toloe	<i>Polygomum sp.</i>
20.	Tombii	<i>Pistia sp.</i>

Source: Field investigation in the course of this study, conducted from 7th through 9th of June, 2002.

(5) Aquatic Biota

1) Plankton

RESULT OF INVENTORY OF PHYTOPLANKTON IN LBB BASIN

No.	Phytoplankton type	B ₁	B ₂	B ₃	B ₄	B ₅	B ₆	B ₇	B ₈	B ₉	B ₁₀	B ₁₁	B ₁₂	B ₁₃	B ₁₄	B ₁₅	B ₁₆	B ₁₇	B ₁₈	B ₁₉	B ₂₀
01	<i>Surirella</i> sp					2	5	6	6	0	0	4	7	7	6	7	4	4	2	5	4
02	<i>Nodularia</i> sp			3	3			1	4			2	5	8	11	10	2	2	1		
03	<i>Rhizosolenia delicatula</i>	4	2			2	4	15	10	2	5	6	5	12	16	16	15	16		2	4
04	<i>Rhizosolenia stolterfothii</i>			2	1	1	1	7	5	1	4	7	1	4	12	10	12	12		2	1
05	<i>Rhizosolenia alata</i>	4	5		1	2	2	6	2	3	3	7	7	2	14	7	8	8		4	4
06	<i>Rhizosolenia robusta</i>	2	5	4	3	1	2	7	2	3	3	7	7	2	14	11	8	8		2	4
07	<i>Fragilaria oceanica</i>		2		2			4	6	6	7	6	6	6	2	6	2	2			
08	<i>Pediastrum simplex</i>			4	4			4	3					2	5	3	1	1	1		
09	<i>Aphanizomenon flosaquae</i>			1	2			1	4					4	2	2	6	7			
10	<i>Ulothrix</i> sp					2	4			4	6	9	5	6	2	2	8	4	2		
11	<i>Closterium</i> sp			2	4		2							11	7	7	2	7			
12	<i>Gonatozygon</i> sp					1	2	4	1					2	1	4	1	1			
13	<i>Policystis</i> sp					1	2					4	2	6	2	1	4	4		2	2
14	<i>Scenedesmus</i> sp				2			7	2					4	4	2	1	1			
15	<i>Nitzschia</i> sp			2	4			11	15	6	14	7	7	9	11	14	2	7	3	5	7
16	<i>Anabaena</i> sp					4	2	4	7			2	4	11	7	5	4	3	5		
17	<i>Amphora</i> sp					2	2			1	6	5	4		3	1	1	1		6	5
18	<i>Pleuroseuma</i> sp			1	1			3	1	2	3						2	1			
19	<i>Cymbella</i> sp			1	1	1	2					1	2	1	2	1			1		
20	<i>Clatophora</i> sp					2	1	1	6		6	2	1		1	2					
21	<i>Polyarthra</i> sp				1			2	5		3			4	2	3	2	2			
	Type Total	3	4	9	13	11	13	16	16	9	11	14	14	19	20	20	19	19	7	8	8
	Individual total/l	10	12	20	29	21	31	99	95	37	71	69	63	101	124	114	85	91	15	28	31
	d-Shannon	0.55	0.6	1.12	1.09	1.02	1.31	2.65	2.54	1.21	2.21	2.14	2.01	3.14	3.41	3.25	2.14	2.41	0.89	1.11	1.26
	E	0.4	0.41	0.62	0.59	0.62	0.71	0.82	0.81	0.66	0.74	0.81	0.71	0.89	0.92	0.96	0.71	0.77	0.42	0.52	0.56

Legend: B₁ = Alo-Pohu, upstream; B₂ = Alo-Pohu, downstream; B₃ = Biyonga, upstream; B₄ = Biyonga, downstream; B₅ = Bolango, upstream; B₆ = Bolango, downstream; B₇ = Topadu, upstream; B₈ = Topadu, downstream; B₉ = Bone, upstream; B₁₀ = Bone, downstream; B₁₁ = Tamalate, upstream; B₁₂ = Tamalate, downstream; B_{13,14,15} = Around floating fish net; B_{16,17} = Outlet of Lake Limboto; B₁₈ = Confluence of Bone and Bolango; B_{19,20} = Tomini Bay.

Source: Field investigation in the course of this study, conducted from 7th through 9th of June, 2002.

RESULT OF INVENTORY OF ZOOPLANKTON IN LBB BASIN

No.	Jenis Zooplankton	B ₁	B ₂	B ₃	B ₄	B ₅	B ₆	B ₇	B ₈	B ₉	B ₁₀	B ₁₁	B ₁₂	B ₁₃	B ₁₄	B ₁₅	B ₁₆	B ₁₇	B ₁₈	B ₁₉	B ₂₀
01	<i>Limacina inflata</i>				4	2	5	5	5			1							2	6	5
02	<i>Daphnia</i> sp							1	2			6		20	14	9	8	14			
03	<i>Conchoecia</i> sp			3	6	1	7	6	6	4	7	4	4	1	1	1					
04	<i>Calanus finmarchicus</i>				3	1	2	3	2		4	2	4	2	6	5	2	2		3	3
05	<i>Conaea gracilis</i>			4	4	2	4	9	7	2	4	2	1	12	10	11	4	5			
06	<i>Paracalanus parvus</i>				1	1	1	9	5	3	5	4	4	5	12	11	3	5	1	2	4
07	<i>Comanthus aponica</i>			3	3	2	2	2	1					2	7	7	4	3			
08	<i>Brachionus falcatus</i>							1	2					2	6	4	2	3	2		
09	<i>Brachionus bidentata</i>							1	1					5	4	2	4	4	2		
10	<i>Keratella quadrata</i>							2	7					3	4	7	2	5			
11	<i>Copepod nauplius</i> (1 type)							5	4	1	7	3	3	11	9	11	5	7	4	9	7
12	<i>Copepod nauplius</i> ((usual typr)			2	4	2	7	1	1		5	1	2	15	11	13	2	7			
13	<i>Notholca striata</i>				1	2	9				3	6	9	13	11	9	6	6			
14	<i>Oithona fallax</i>			3	3	1	6	3	5	3	5	7	9	24	26	21	15	19	5	11	13
15	<i>Oithona brevicornis</i>						5	2	2		1	6	6	20	15	17	4	7	2	6	4
16	<i>Bosnina longirostis</i>			3	4	1	3			2	1	2	4	3	2	1	1	1			
17	<i>Acartia clausi</i>			2	3			1	1		3				3					4	3
	Type total	0	0	7	11	9	11	15	15	6	11	10	10	14	15	15	14	14	7	7	7
	Individual total/l	0	0	27	47	24	62	66	66	21	56	54	56	138	141	129	76	88	25	48	46
	d-Shannon	0	0	0.58	0.84	0.55	1.04	1.12	1.1	0.5	0.92	0.91	1	3.05	3.25	2.92	1.52	1.77	0.52	0.85	0.82
	E	0	0	0.21	0.52	0.33	0.64	0.74	0.69	0.22	0.58	0.51	0.53	0.97	0.94	0.89	0.78	0.81	0.32	0.32	0.29

Legend: B₁ = Alo-Pohu, upstream; B₂ = Alo-Pohu, downstream; B₃ = Biyonga, upstream; B₄ = Biyonga, downstream; B₅ = Bolango, upstream; B₆ = Bolango, downstream; B₇ = Topadu, upstream; B₈ = Topadu, downstream; B₉ = Bone, upstream; B₁₀ = Bone, downstream; B₁₁ = Tamalate, upstream. B₁₂ = Tamalate, downstream; B_{13,14,15} = Around floating fish net; B_{16,17} = Outlet of Lake Limboto; B₁₈ = Confluence of Bone and Bolango; B_{19,20} = Tomini Bay.

Source: Field investigation in the course of this study, conducted from 7th through 9th of June, 2002.

2) Benthos

RESULT OF INVESTIGATION ON BENTHOS IN LBB BASIN

No	Local name (Indonesian name)	Scientific name	Habitat
01	Rebon	<i>Caridina</i> sp	Lake and/or river
02	Udang	<i>Macrobrachium</i> spp	River
03	Kijing Taiwan	<i>Anadonta woodiana</i>	Lake and/or river
04	Siput	<i>Thiara</i> sp	Lake and/or river
05	Siput	<i>Nerita</i> sp	Lake and/or river
06	Siput	<i>Nelanoides</i> sp	Lake and/or river
07	Kepiting	<i>Eriocheir</i> sp	River
06	Kerang	<i>Trisipan</i> sp	Lake and/or river

Source: Field investigation in the course of this study, conducted from 7th through 9th of June, 2002. Data was obtained mainly from interview survey and observation at local fish market.

3) Nekton

RESULT OF INVESTIGATION ON NEKTON IN LBB BASIN

No	Local name (Indonesian name)	Common name (Indonesian name)	Scientific name	Habitat
1	Ikan Nila Merah	Nila Merah	<i>Oreochromis niloticus</i>	Lake
2	Ikan Mas	Mas	<i>Cyprinus carpio</i>	Lake
3	Ikan Manggabai	Gabus (besar)	<i>Glossogobius giurus</i>	Lake
4	Ikan Hundala	Gabus(kecil)	<i>Glossogobius giurus</i>	Lake
5	Ikan Saribu	Sepat	<i>Trichogaster trichopterus</i>	Lake and/or river
6	Ikan Huluu	Payangka (kecvil)	<i>Ophiocara aporos</i>	Lake and/or river
7	Ikan Payangga	Payangka (besar)	<i>Ophiocara aporos</i>	Lake and/or river
8	Ikan Dumbaya	Betok	<i>Anabas testudineus</i>	Lake
9	Ikan Bulalao	Belanak	<i>Mugil cephalus</i>	River
10	Ikan Jawa	Mujair	<i>Oreochromis mossambichus</i>	Lake and/or river
11	Ikan Kabos	Gabus	<i>Ophiocephalus striatus</i>	Lake
12	Tawes	Tawes	<i>Puntius gonionotus</i>	River
13	Ikan Karper	Nilem	<i>Osteochilus hasselti</i>	Lake
14	Ikan Lele	Lele	<i>Clarias batrachus</i>	Lake and/or river
15	Sogili	Sidat	<i>Anguilla</i> sp.	Lake and/or river
16	Ikan Saribu	Sepat Siam	<i>Trichogaster pectoralis</i>	Lake and/or river

Source: Field investigation in the course of this study, conducted from 7th through 9th of June, 2002. Data was obtained mainly from interview survey and observation at local fish market.