

## *Tables*

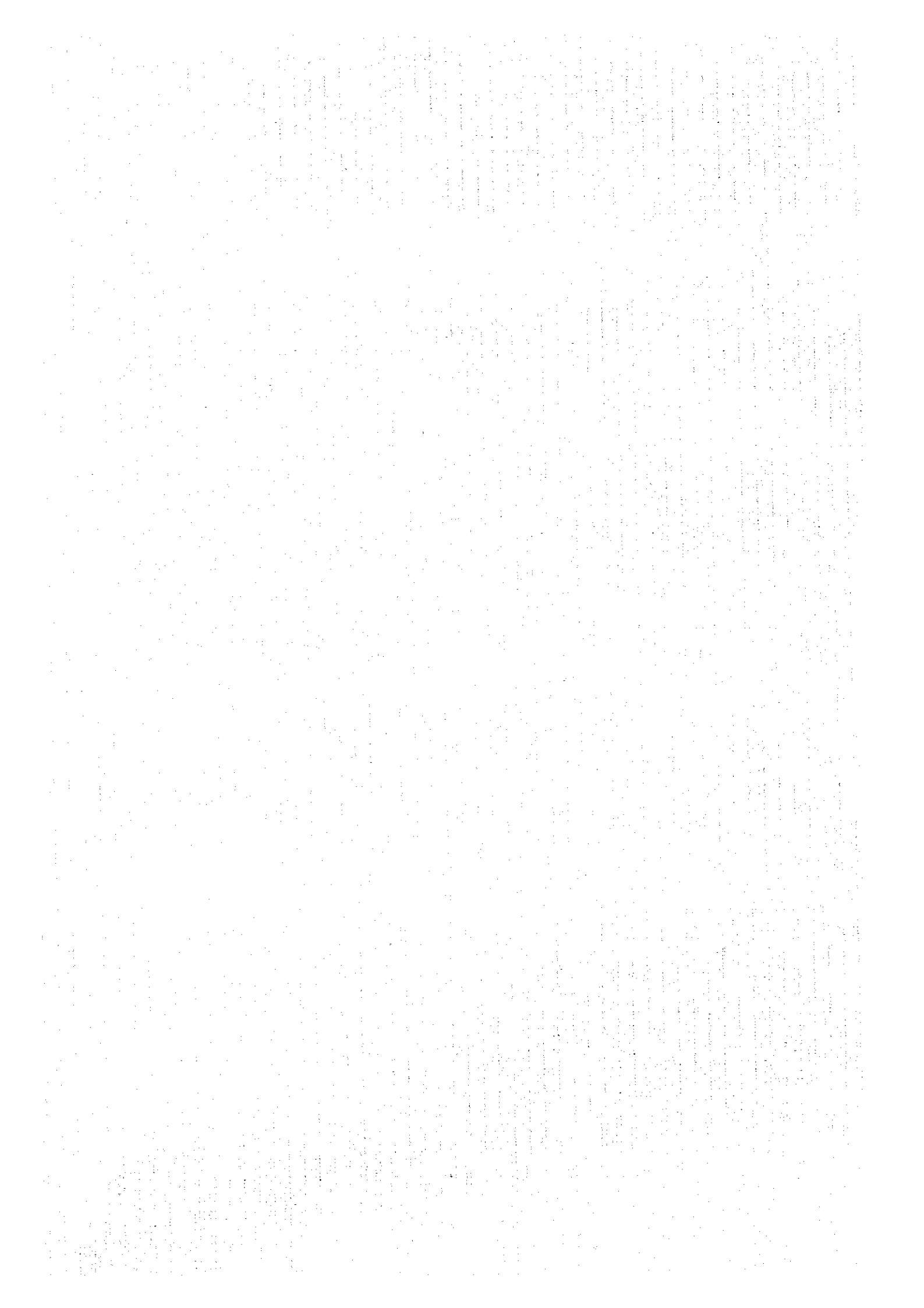


Table I-1 Soil Description of Preliminary Boring Test with Auger

No. of Soil Site	Symbol of Soil Site	Location		Parent Material	Effective Soil Horizon Depth	Present Land Use	Date
		Village	District				
1	PB-1	B.Daxe	LG	Basalt	Deep	Rice field	20/04/1995
2	PB-2	B.Natabeng Nai	LG	Basalt	Deep	Rice field	20/04/1995
3	PB-3	VIII No.08-2	PX	Basalt	Shallow	Grassland	20/04/1995
4	PB-4	B.Thong Kam	LG	Basalt	Deep	Coffee garden	20/04/1995
5	PB-5	B.Dong Noy	LG	Basalt	Deep	Fruit garden	20/04/1995
6	PB-6	B.Kianglatsoung	BC	Basalt	Deep	Rice field	20/04/1995
7	PB-7	B.Phonhin	LG	Basalt	Deep	Coffee garden	20/04/1995
8	PB-8	B.Kaphon	LG	Basalt	Medium	Rice field	20/04/1995
9	PB-9	B.Dongtong Noi	LG	Basalt	Deep	Coffee garden	20/04/1995
10	PB-10	B.Nongb	BC	Basalt	Deep	Clear forest	20/04/1995
11	PB-11	B.Talab	BC	Basalt	Deep	Fruit garden	20/04/1995
12	PB-12	B.Thongkatai	PX	Basalt	Deep	Grassland	20/04/1995
13	PB-13	B.Pakyong	PX	Basalt	Shallow	Grassland	20/04/1995
14	PB-14	B.Nong-loy	PX	Basalt	Deep	Rice field	20/04/1995
15	PB-15	B.Nong Kin	PX	Basalt	Shallow	Grassland	21/04/1995
16	PB-16	B.Kong	PX	Basalt	Shallow	Coffee garden	21/04/1995
17	PB-17	B.Xepian	PX	Basalt	Deep	Grassland	21/04/1995
18	PB-18	B.Ph.Dindeng	PX	Basalt	Shallow	Coffee garden	21/04/1995
19	PB-19	B.Khankok	TH	Basalt	Shallow	Rice field	21/04/1995
20	PB-20	B.Bong Nok	TH	Basalt	Deep	Grassland	21/04/1995
21	PB-21	B.Houaytong	BC	Basalt	Deep	Rice field	21/04/1995
22	PB-22	B.Nongtoua	BC	Basalt	Shallow	Grassland	21/04/1995
23	PB-23	B.Ten	LG	Basalt	Medium	Rice field	21/04/1995
24	PB-24	MKL No.34	PX	Basalt	Deep	Grassland	21/04/1995
25	PB-25	B.Nong Khuang	PX	Basalt	Shallow	Grassland	21/04/1995
26	PB-26	B.Houag Xay	PX	Basalt	.	Scrub	21/04/1995
27	PB-27	MKL NO.23-II	PX	Basalt	Deep	Coffee garden	21/04/1995
28	PB-28	B.LaK 43	PX	Basalt	Deep	Coffee garden	21/04/1995
29	PB-29	NKh.L.08	PX	Basalt	Shallow	Grassland	21/04/1995
30	PB-30	B.Phoyoy	PX	Basalt	Shallow	Coffee garden	21/04/1995
31	PB-31	Pakxong	PX	Basalt	Shallow	Grassland	21/04/1995

Table I-2 Soil Description of Regular Boring Test with Auger

Symbol of Survey Site : B-1

Information on the Soil Site

1. Location	: BKATOVAT	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 1230mMSL	11. Vegetation	: Rice, coffee & banana
3. Land use	: Rice, coffee & banana	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: Small rain last evening	14. Date	: 28/04/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: None	16. Soil group	: Soil Code 8- Lithic Nitisols (Lithosols)
8. Topography	: Gently sloping		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-25 cm	Texture=Clay loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color= Dark brown (7.5YR3/4); Structure=Granular; Pore=Many & fine; Oxidative sediments (Salts)=No; Mn=No; Fe2+=No; Hardness=Low; Plasticity=Low to medium; Stickness=Low to medium; Wetness=---; Roots=Many & fine.
AB	25-70	Texture=Silty clay loam; Gravel & stone=No; Humus=<2%; Peat muck=No; Color= Brown (7.5YR4/6); Structure=Granular; Pore=Many & fine; Oxidative sediments (Salts)=No; Mn=No; Fe2+=No; Hardness=---; Plasticity=Medium; Stickness=Medium; Wetness=---; Roots=Few & very fine.
B1	70-95	Texture=Silty clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Bright brown (7.5YR5/6); Structure=Granular; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=---; Plasticity=Medium; Stickness=Medium to high; Wetness=---; Roots=Very few & very fine.

Symbol of Survey Site : B-2

Information on the Soil Site

1. Location	: B.KUB	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 510mMSL	11. Vegetation	: Scrub forest
3. Land use	: Upland crops & banana	12. Application of fertilizer:	
4. Weather of Examination	: Good	13. Drainage	: Well
5. Precipitation	: Small rain last evening	14. Date	: 01/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 7- Dystric Nitisols (Lithic Nitisols)
8. Topography	: Gently sloping		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-18 cm	Texture=Silt; Gravel & stone=No; Humus=No; Peat muck=No; Color= Dark reddish brown (5YR3/5); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments (Salts)=No; Mn=No; Fe2+=No; Hardness=---; Plasticity=Medium; Stickness=Very sticky; Wetness=---; Roots=Many & fine.
AB	18-50	Texture=Silty clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown (5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=---; Plasticity=Medium to high; Stickness=Very sticky; Wetness=---; Roots=Many & very fine.
B1	50-100	Texture=Clay; Gravel & stone=5-10% of basalt fragments; Humus=No; Peat muck=No; Color=Reddish brown(5YR4/4); Structure=Granular & crumb; Pore=Medium & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=---; Plasticity=Medium to high; Stickness=Very sticky; Wetness=---; Roots=Many & fine.

Symbol of Survey Site : B- 3

Information on the Soil Site

1. Location	: B.KHAMKOK	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 610mMSL	11. Vegetation	: Upland rice
3. Land use	: Upland field	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 01/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 7- Dystric Nitosols (Lithic Nitosols)
8. Topography	: Undulating		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-20 <sup>cm</sup>	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color= Dark reddish brown (SYR3/3); Structure=Granular & fine; Pore=Many; Oxidative sediments (Salts)=No; Mn=No; Fe2+=No; Hardness=---; Plasticity=Very plastic; Stickness=Very Sticky; Wetness=---; Roots=Many.
AB	20+	Gravel & stone=>90% of basaltic rock(2-200mm in diameter).

Symbol of Survey Site : B- 4

Information on the Soil Site

1. Location	: B.THATHENG	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 830mMSL	11. Vegetation	: Coffee
3. Land use	: Coffee garden	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: Small rain last evening	14. Date	: 01/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 7- Dystric Nitosols (Lithic Nitosols)
8. Topography	: Gently sloping		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-15 <sup>cm</sup>	Texture=Silty Clay; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color= Dark reddish brown (SYR3/3); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=---; Plasticity=Very plastic; Stickness=Very sticky; Wetness=---; Roots=Many & fine.
B1	15-50	Texture=Silty clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown (SYR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=---; Plasticity=Very plastic; Stickness=Very sticky; Wetness=---; Roots=Many & fine.
B1	50-100	Texture=Clay; Gravel & stone=5-10% of basalt fragments; Humus=No; Peat muck=No; Color=Reddish brown(SYR4/4); Structure=Granular & crumb; Pore=Medium & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=---; Plasticity=Very plastic; Stickness=Very sticky; Wetness=---; Roots=Many & fine.

Symbol of Survey Site : B- 5

Information on the Soil Site

1. Location	: B-PONG-NUA	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 780mMSL	11. Vegetation	: Scrub
3. Land use	: Scrub forest	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 01/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitisols
8. Topography	: Gently sloping		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-15 cm	Texture=Silty clay loam; Gravel & stone=No; Humus=2-3%; Feat mock=No; Color=Dark reddish brown (SYR3/3); Structure=Granular & crumb & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=---; Plasticity=Very plastic; Stickness=Very sticky; Wetness=---; Roots=Many & fine.
AB	15-55	Texture=Clay loam; Gravel & stone=No; Humus=No; Feat mock=No; Color=Dark reddish brown (SYR3/4); Structure=Granular & crumb & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=---; Plasticity=Very plastic; Stickness=Very sticky; Wetness=---; Roots=Many & very fine.
B	55-100	Texture=Clay; Gravel & stone=No; Humus=No; Feat mock=No; Color=Yellowish red (SYR4/6); Structure=Granular & crumb & fine; Pore=Many & fine; Oxidative sediments (Salts)=No; Mn=No; Fe2=No; Hardness=---; Plasticity=Very plastic; Stickness=Very sticky; Wetness=---; Roots=Very few & very fine.

Symbol of Survey Site : B- 6

Information on the Soil Site

1. Location	: B LAVANO	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 620mMSL	11. Vegetation	: Scrub forest
3. Land use	: Scrub forest	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 01/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitisols
8. Topography	: Undulating		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-20 cm	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Feat mock=No; Color= Dark reddish brown (SYR3/3); Structure=Granular & crumb & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=---; Plasticity=Very; Stickness=Very sticky; Wetness=---; Roots=Many & fine.
AB	20-60	Texture=Silty loam; Gravel & stone=No; Humus=No; Feat mock=No; Color=Dark reddish brown (SYR3/4); Structure=Granular & crumb & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=---; Plasticity=Very plastic; Stickness=Very sticky; Wetness=---; Roots=Many & fine.
B	60-100	Texture=Clay; Gravel & stone=No; Humus=No; Feat mock=No; Color=Dark reddish brown(SYR3/4); Structure=Granular & crumb & fine; Pore=Moderate & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=---; Plasticity=Very plastic; Stickness=Very sticky; Wetness=---; Roots=Few & very fine.

Symbol of Survey Site : B- 7

Information on the Soil Site

1. Location		10. Parent material or mode of deposition	: Basalt
2. Elevation		11. Vegetation	: Grass
3. Land use	: Grass land	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 01/05/1995
6. Slope		15. Surveyer	: JICA Survey Team
7. Erosion		16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography			
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-20 cm	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark yellowish brown (5YR3/4); Structure=Granular & crumb & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=---; Plasticity=Very plastic; Stickness=Very sticky; Wetness=---; Roots=Many & fine.
	20+	Gravel & stone->90%.

Symbol of Survey Site : B- 8

Information on the Soil Site

1. Location	: B.PHOKHEM	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 850mMSL	11. Vegetation	: Rice, chilli, coffee
3. Land use	: Upland field	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 02/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Gently sloping		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-30 cm	Texture=Silty clay; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color= Dark yellowish brown (5YR3/4); Structure=Granular & crumb & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=---; Plasticity=Very plastic; Stickness=Very sticky; Wetness=---; Roots=Many & fine.
C	30+	Gravel & stone->90% of basaltic segments having size of 20-200mm in diameter.

Symbol of Survey Site : B-9

Information on the Soil Site

1. Location	: B DAXIA NOY	10 Parent material or mode of deposition	: Basalt
2. Elevation	: 790mMSL	11. Vegetation	: Upland rice & coffee
3. Land use	: Upland field	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 01/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 7- Dystric Nitosols (Lithic Nitosols)
8. Topography	: Very gently sloping		
9. Geology			

Soil Profile

Horizon	Depth cm	Description
A	0-15	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Very dark brown (10YR2/2); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=---; Plasticity=Very plastic; Stickness=Very sticky; Wetness=moist; Roots=Many & fine.
B1	15-60	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown (7.5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments (Salts)=No; Mn=No; Fe2+=No; Hardness=---; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
B2	60-100	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark Yellowish brown(10YR4/5); Structure=Granular & fine; Pore=Moderate & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2=No; Hardness=---; Plasticity=Very plastic; Stickness =Very sticky; Wetness=Moist; Roots=Many & fine.

Symbol of Survey Site : B-10

Information on the Soil Site

1. Location	: B DONDOV	10 Parent material or mode of deposition	: Basalt
2. Elevation	: 610mMSL	11. Vegetation	: Rice, tobacco, chilli, banana, cardamom
3. Land use	: Upland field	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 01/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 7- Dystric Nitosols
8. Topography	: Gently sloping		
9. Geology			

Soil Profile

Horizon	Depth cm	Description
A	0-20	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color= Dark brown (7.5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments (Salts)=No; Mn=No; Fe2+=No; Hardness=---; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
B1	20-55	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown (5YR3/4); Structure=Granular & fine; Pore=Many & medium; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & medium.
B2	55-100	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color= Reddish brown(5YR4/4); Structure=Granular & very fine; Pore=Moderate & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=---; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Few & very fine.



Symbol of Survey Site : B-11

Information on the Soil Site

1. Location	: B XANUM	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 410mMSL	11. Vegetation	: Upland rice
3. Land use	: Upland field	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 02/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Gently sloping to undulate.		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-15 cm	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=dry; Roots=Many & fine.
AB	15-40	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown (5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
B1	40-80	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown(2.5YR3/4); Structure=Sub-rounded & fine; Pore=Few & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Medium; Plasticity=Moderate; Stickness=Very sticky; Wetness=Moist; Roots=Very few & very fine.
B2	80-100	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown(2.5YR3/4); Sub-rounded & fine; Pore=Few & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Medium; Plasticity=Moderate; Stickness=Very sticky; Roots=Very few & very fine.

Symbol of Survey Site : B-12

Information on the Soil Site

1. Location	: B VANGPUAY	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 590mMSL	11. Vegetation	: Banana
3. Land use	: Banana garden	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: Just rain	14. Date	: 02/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Gently sloping		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-20 cm	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color= Dark brown (7.5YR3/4); Structure=Granular & crumb & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
AB	20-60	Texture=Silty loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Reddish brown (5YR4/4); Structure=Granular & crumb & fine; Pore=Many & medium; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
B1	60-100	Texture=Clay; Gravel & stone=10-20% of fragments having size of 20-50mm in diameter; Humus=No; Peat muck=No; Color=Yellowish red(5YR4/6); Structure=Granular & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Plasticity=Very plastic; Stickness=Very sticky; Wetness=dry; Roots=Many & fine.
B2	80-100+	Texture=Clay; Gravel & stone=10-20% of fragments having size of 20-50mm in diameter; Humus=No; Peat muck=No; Color=Yellowish red(5YR4/6); Structure=-; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=dry; Roots=Many & fine.

Symbol of Survey Site : B-13

Information on the Soil Site

1. Location	: B DONG	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 890mMSL	11. Vegetation	: Coffee, tamarine & litchet
3. Land use	: Three crops garden	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: Rain	14. Date	: 02/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitisols
8. Topography	: Very gently sloping		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-15 cm	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown(7.5YR3/3); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
AB	15-50	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown (7.5YR4/3); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
B1	50-85	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown (7.5YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Medium & fine.
B2	85-100+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown (7.5YR4/4); Granular & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Roots=Few & very fine.

Symbol of Survey Site : B-14

Information on the Soil Site

1. Location	: B KHOUA	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 650mMSL	11. Vegetation	: Native grass
3. Land use	: Grassland	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 02/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitisols
8. Topography	: Gently sloping		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-18 cm	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color= Dark brown (7.5YR3/2); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
AB	18-40	Texture=Silty loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown (5YR2/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
B1	40-80	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color= Reddish brown(5YR4/4); Structure=Granular & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=dry; Roots=Moderate & fine.
B2	80-100+	Texture=Clay; Gravel & stone=No; Humus=No; Color=Reddish brown(5YR4/4); Structure=Granular fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=dry; Roots=Few & very fine.

Symbol of Survey Site : B-15

**Information on the Soil Site**

1. Location	: B.MUNPAKIT	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 562mMSL	11. Vegetation	: Upland rice
3. Land use	: Upland field	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: Just rain	14. Date	: 02/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Gently sloping		
9. Geology			

**Soil Profile**

Horizon	Depth	Description
A	0-20 cm	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark reddish brown (5YR3/3); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=moist; Roots=Many & fine.
AB	20-60	Texture=Silty loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown (2.5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
B	60-100	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown(2.5YR3/4); Structure=Granular & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Moderate & very fine.

Symbol of Survey Site : B-16

**Information on the Soil Site**

1. Location	: B.VANGKHANAN	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 300mMSL	11. Vegetation	: Upland rice
3. Land use	: Upland field	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 03/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Very gently sloping		
9. Geology			

**Soil Profile**

Horizon	Depth	Description
A	0-18 cm	Texture=Silty clay loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark reddish brown (2.5YR2.5/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very Plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
B1	18-65	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown (2.5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & medium.
B2	65-100+	Texture=Silty clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark Red (2.5YR3/6); Structure=Granular & very fine; Pore=Moderate & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & very fine.

Symbol of Survey Site : B-17

Information on the Soil Site

1. Location	: B.SONGHONG-GNAI	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 330mMSL	11. Vegetation	: Upland rice
3. Land use	: Upland field	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 03/05/1995
6. Slope	: 2-5%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Undulating		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-15 <sup>on</sup>	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR4/3); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=dry; Roots=Many & fine.
AB	15-45	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Reddish brown (5YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & medium.
B1	45-80	Texture=Silty clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Reddish brown(5YR4/6); Structure=Sub-rounded & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Moderate & fine.
B2	80-100+	Texture=Silty clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Reddish brown(5YR4/6); Structure=Sub-rounded & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Medium; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Moderate & very fine.

Symbol of Survey Site : B-18

Information on the Soil Site

1. Location	: B.NONO TOUA	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 430mMSL	11. Vegetation	: Coffee
3. Land use	: Coffee garden	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 03/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Very gently sloping		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-20 <sup>on</sup>	Texture=Clay loam; Gravel & stone=No; Humus=3-4%; Peat muck=No; Color=Dark reddish brown (5YR3/3); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & moderate.
B1	20-60	Texture=Clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown (2.5YR2.5/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & coarse.
B2	60-100+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark red (2.5YR3/6); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Moderate & fine.

Symbol of Survey Site : B-19

Information on the Soil Site

1 Location	: B.NABON	10 Parent material or mode of deposition	: Basalt
2 Elevation	: 420mMSL	11 Vegetation	: Upland rice & chilli
3 Land use	: Upland field	12 Application of fertilizer:	
4 Weather of Examination	: Fine	13 Drainage	: Well
5 Precipitation	: No	14 Date	: 03/05/1995
6 Slope	: 0-2%	15 Surveyer	: JICA Survey Team
7 Erosion	: Slightly	16 Soil group	: Soil Code 6- Dystric Nitisols
8 Topography	: Very gently sloping		
9 Geology			

Soil Profile

Horizon	Depth cm	Description
A	0-15	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark reddish brown (5YR3/3); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=dry; Roots=Many & fine.
AB	15-40	Texture=Silty loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown (5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & coarse.
B1	45-75	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown(2.5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Moderate & fine.
B2	75-100+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown(2.5YR3/4); Structure=Sub-rounded & fine; Pore=Medium & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2=No; Hardness=Medium; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Few & very fine.

Symbol of Survey Site : B-20

Information on the Soil Site

1 Location	: B.LEN	10 Parent material or mode of deposition	: Basalt
2 Elevation	: 500mMSL	11 Vegetation	: Rice & banana
3 Land use	: Upland field	12 Application of fertilizer:	
4 Weather of Examination	: Fine	13 Drainage	: Well
5 Precipitation	: No	14 Date	: 03/05/1995
6 Slope	: 2-8%	15 Surveyer	: JICA Survey Team
7 Erosion	: Slightly	16 Soil group	: Soil Code 6- Dystric Nitisols
8 Topography	: Gently sloping		
9 Geology			

Soil Profile

Horizon	Depth cm	Description
A	0-15	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark reddish brown (5YR3/3); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
AB	15-40	Texture=Silty loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown (5YR3/3); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
B1	40-80	Texture=Clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown(5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Moderate & medium.
B2	80-100+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown(2.5YR3/4); Structure=Granular & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Few & fine.

Symbol of Survey Site : B-21

Information on the Soil Site

1. Location	: B SIXIANGMAI	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 700mMSL	11. Vegetation	: Coffee
3. Land use	: Coffee garden	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 03/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Gently sloping		
9. Geology			

Soil Profile

Horizon	Depth cm	Description
A	0-15	Texture=Clay loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark reddish brown (5YR2/5); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=dry; Roots=Many & fine.
AB	15-40	Texture=Clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown (2.5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
B1	40-80	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark red (2.5YR3/6); Structure=Granular & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Moderate & fine.
B2	80-100+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark red (2.5YR3/6); Structure=Granular & fine; Pore=Few & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2=No; Hardness=Medium; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Few & very fine.

Symbol of Survey Site : B-22

Information on the Soil Site

1. Location	: B BENO	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 550mMSL	11. Vegetation	: Coffee
3. Land use	: Coffee garden	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 03/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Very gently sloping		
9. Geology			

Soil Profile

Horizon	Depth cm	Description
A	0-20	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
AB	20-60	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown (5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & coarse.
B	60-100+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Reddish yellow (5YR4/6); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Few & fine.

Symbol of Survey Site : B-23

Information on the Soil Site

1. Location	: B KENGKUA	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 450mMSL	11. Vegetation	: Rice & grenade
3. Land use	: Upland field	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 02/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Gently sloping		
9. Geology			

Soil Profile

Horizon	Depth cm	Description
A	0-20	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark reddish brown (5YR3/3); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
B	20-55	Texture=Silty loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown (2.5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Moderate & very fine.
C	55+	Gravel & stone=>50% of basaltic rock(20-200mm in diameter).

Symbol of Survey Site : B-24

Information on the Soil Site

1. Location	: B HOUAYXANO	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 1080mMSL	11. Vegetation	: Coffee
3. Land use	: Coffee garden	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 04/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Undulating		
9. Geology			

Soil Profile

Horizon	Depth cm	Description
A	0-20	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very Plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
AB	20-60	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark yellowish brown (10YR4/4); Structure=Granular & fine; Pore=Many & medium; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & medium.
B	60-100+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark yellowish brown(10YR4/4); Structure=Sub-rounded & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & medium.

Symbol of Survey Site : B-25

Information on the Soil Site

1. Location	: B PHANOVAN, GNAI	10 Parent material or mode of deposition	: Basalt
2. Elevation	: 1080mMSL	11. Vegetation	: Coffee
3. Land use	: Coffee garden	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Data	: 04/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Undulating		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-20 cm	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR3/3); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
AB	20-55	Texture=Silty clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown (7.5YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & moderate to coarse.
B	55-100+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown(7.5YR4/6); Structure=Granular & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.

Symbol of Survey Site : B-25

Information on the Soil Site

1. Location	: B.PAKYONG	10 Parent material or mode of deposition	: Basalt
2. Elevation	: 1190mMSL	11. Vegetation	: Coffee
3. Land use	: Coffee garden	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Data	: 04/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Gently sloping		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-15 cm	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR3/3); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & medium.
B1	15-45	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown (7.5YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & medium.
B2	45-70	Texture=Silty clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown(7.5YR4/6); Structure=Sub-rounded & fine; Pore=Moderate & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Moderate & fine.
C	70+	Gravel & stone= >90% of basaltic rock(20-200mm in diameter).



Symbol of Survey Site

B-27

## Information on the Soil Site

1. Location	: B PAKYONG	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 1180mMSL	11. Vegetation	: Scrub forest & tropical grass
3. Land use	: Scrub forest & trop grass	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: Cloudy	14. Date	: 04/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitisols
8. Topography	: Undulating		
9. Geology			

## Soil Profile

Horizon	Depth cm	Description
A	0-15	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=moist; Roots=Many & fine.
AB	15-60	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown (7.5YR4/4); Structure=Granular & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
B	60-100+	Texture=Silty clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown(7.5YR4/6); Structure=Sub-rounded & fine; Pore=Moderate & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Few & very fine.

Symbol of Survey Site

B-28

## Information on the Soil Site

1. Location	: B XEPIAN	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 1250mMSL	11. Vegetation	: Grass & clear forest
3. Land use	: Grassland & clear forest	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: Just rain	14. Date	: 04/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly to moderately	16. Soil group	: Soil Code 8- Lithic Nitisols
8. Topography	: Undulating		
9. Geology			

## Soil Profile

Horizon	Depth cm	Description
A	0-20	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark yellowish brown (10YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
B1	20-55	Texture=Silty loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown (7.5YR4/6); Structure=Sub-rounded & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=5-10% of 20-100mm in size; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Moderate & very fine.
B2	55-100+	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown(7.5YR4/6); Structure=Sub-rounded & very fine; Pore=Moderate & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Few & very fine.

Symbol of Survey Site : B-29

Information on the Soil Site

1. Location	: B NONG LOUANG	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 1220mMSL	11. Vegetation	: Coffee & grass
3. Land use	: Coffee garden & grassland	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Data	: 05/05/1995
6. Slope	: 2-3%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Undulating		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-15 cm	Texture=Silty loam; Gravel & stone=25mm-concretion; Humus=2-3%; Peat muck=No; Color=Dark yellowish brown (10YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn & Fe2+=3-5% of 2-5cm; Hardness=Medium; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
B	15-50	Texture=Silty loam; Gravel & stone=25mm-concretion; Humus=No; Peat muck=No; Color=Dark yellowish brown (10YR4/6); Structure=Sub-rounded & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn & Fe2+=3-5% of 2-5cm; Hardness=Medium; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
Bt1	50-80	Texture=Silty clay loam; Gravel & stone=25mm-concretion; Humus=No; Peat muck=No; Color=Yellowish brown(10YR5/4); Structure=Sub-rounded & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn & Fe2+=3-5% of 2-5cm; Hardness=Medium; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Moderate & fine.
Bt2	80-100+	Texture=Silty clay; Gravel & stone=25mm-concretion; Humus=No; Peat muck=No; Color=Yellowish brown(10YR5/4); Structure=Sub-rounded & fine; Pore=Few & fine; Oxidative sediments(Salts)=No; Mn & Fe2+=3-5% of 2-5cm; Hardness=Medium; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Few & very fine.

Symbol of Survey Site : B-30

Information on the Soil Site

1. Location	: B PAKYONG	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 1190mMSL	11. Vegetation	: Coffee
3. Land use	: Coffee garden	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Data	: 04/05/1995
6. Slope	: 2-3%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Gently sloping		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-15 cm	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR3/3); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & medium.
B1	15-45	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown (7.5YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & medium.
B2	45-70	Texture=Silty clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown(7.5YR4/6); Structure=Sub-rounded & fine; Pore=Moderate & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Moderate & fine.
C	70+	Gravel & stone=>90% of basaltic rock(20-200mm in diameter).

Symbol of Survey Site : B-31

Information on the Soil Site

1. Location	: B.FHOUMAKKO	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 1290mMSL	11. Vegetation	: Tropical grass
3. Land use	: Grassland	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 05/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Undulating		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-20 <sup>cm</sup>	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark yellowish brown (10YR4/6); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Medium; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
Bt1	20-65	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown (7.5YR5/6); Structure=Sub-rounded & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Few & fine.
Bt2	65-100+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown(7.5YR5/6); Structure=Sub-rounded & fine; Pore=Few & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2=No; Hardness=Hard; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Very few & very fine.

Symbol of Survey Site : B-32

Information on the Soil Site

1. Location	: PHOU OY	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 1303mMSL	11. Vegetation	: Grass & scrub
3. Land use	: Grassland & scrub forest	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 05/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 8- Lithic Nitosols
8. Topography	: Undulatingly		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-20 <sup>cm</sup>	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Medium; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
Bt1	20-50	Texture=Silty clay loam; Gravel & stone=Several concretions & 5-10% Fe+(2-10mm); Humus=2-3%; Peat muck=No; Color= Strong brown (7.5YR4/6); Structure=Sub-grounded & fine; Pore= Few & fine; oxidative sediments(Salts)=No; Mn+Fe2+=5-10%; Hardness=Medium; Plasticity=Very plastic; Stickness= Very; Wetness=Moist; Roots= Few & fine.
Bt2	50-75	Texture=Clay loam; Gravel & stone=5-10% of Fe+; Humus=No; Peat muck=No; Color= Strong brown(7.5YR4/6); Structure=Sub-rounded & fine; Pore=Few & very fine; Oxidative sediments(Salts)=No; Mn+Fe+=5-10%; Hardness=Hard; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Very few & very fine.
C	75+	Texture=Clay; Gravel & stone= >90% of basaltic concretion; Color=Strong brown(7.5YR 7.54/6); Mn+Fe2+= >90% of basaltic rock.

Symbol of Survey Site : B-33

Information on the Soil Site

1 Location	: B KATM-TOK	10 Parent material or mode of deposition	: Sand stone
2 Elevation	: 900mMSL	11 Vegetation	: Coniferous forest & savannah
3 Land use	: Coniferous forest	12 Application of fertilizer:	
4 Weather of Examination	: Fine	13 Drainage	: Well
5 Precipitation	: No	14 Date	: 08/05/1995
6 Slope	: 8-10%	15 Surveyer	: JICA Survey Team
7 Erosion	: Moderately	16 Soil group	: Soil Code 5- Lithic Acrisols
8 Topography	: Rolling		
9 Geology			

Soil Profile

Horizon	Depth	Description
Ao	0-2 cm	Color=Dark grayish brown(10YR4/2).
A	2-10	Texture=Loamy sandy; Gravel & stone=No; Humus=1-2%; Peat muck=No; Color=Yellowish brown (10YR5/6); Structure=Single grain & compact; ; Pore=Few; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Hard; Plasticity=No; Stickness=No; No.
	10+	Gravel & stone=Sand stone.

Symbol of Survey Site : B-34

Information on the Soil Site

1 Location	:	10 Parent material or mode of deposition	: Sand stone
2 Elevation	: 980mMSL	11 Vegetation	: Savannah & clear forest
3 Land use	: Savannah & clear forest	12 Application of fertilizer:	
4 Weather of Examination	: Fine	13 Drainage	: Well
5 Precipitation	: No	14 Date	: 08/05/1995
6 Slope	: 8-16%	15 Surveyer	: JICA Survey Team
7 Erosion	: Moderately	16 Soil group	: Soil Code 5- Lithic Acrisols
8 Topography	: Rolling		
9 Geology			

Soil Profile

Horizon	Depth	Description
A	0-10 cm	Texture=Sandy loam; Gravel & stone=No; Humus=0-1%; Peat muck=No; Color=Dark yellowish brown (10YR4/6); Structure=Single grain & compact; Pore=Few & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Moderate; Plasticity=No; Plastic; Stickness=No; Wetness=Dry; Roots=Many & fine.
AB	10-35	Texture=Loamy sand; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown (7.5YR5/6); Structure=Single grain & compact; Pore=Few & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Moderate; Plasticity=No; Stickness No; Wetness=Dry; Roots=Few & Very fine.
B1	35-70	Texture=Sandy clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Yellowish red(5YR5/8); Structure=Single grain & compact; Pore=Few & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Moderate; Plasticity=No; Stickness =No; Wetness=Dry; Roots=Very few & very fine.
B2	70-100+	Texture=Sandy clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Red (2.5YR4/8); Structure=Single grain & compact; Pore=Few & fine; Oxidative sediments=No; Mn=No; Fe2+=No; Hardness=Hard; Plasticity=No; Stickness=No; Wetness=Dry; Roots=No.

Symbol of Survey Site : B-35

Information on the Soil Site

1. Location	:	10. Parent material or mode of deposition	: Sand stone
2. Elevation	:	11. Vegetation	: Evergreen forest
3. Land use	:	12. Application of fertilizer:	
4. Weather of Examination	:	13. Drainage	: Well
5. Precipitation	:	14. Date	: 08/05/1995
6. Slope	:	15. Surveyer	: JICA Survey Team
7. Erosion	:	16. Soil group	: Soil Code 5- Lithic Acrisols
8. Topography	:	9. Geology	

Soil Profile (is same as B-34)

Horizon	Depth	Description
A	0-10 cm	Texture=Sandy loam; Gravel & stone=No; Humus=0-1%; Peat muck=No; Color=Dark yellowish brown (10YR4/6); Structure=Single grain & compact; Pore=Few & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Moderate; Plasticity=No; Plastic; Stickness=No; Wetness=Dry; Roots=Many & fine.
AB	10-35	Texture=Loamy sand; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown (7.5YR5/6); Structure=Single grain & compact; Pore=Few & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Moderate; Plasticity=No; Stickness No; Wetness=Dry; Roots=Few & Very fine.
B1	35-70	Texture=Sandy clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Yellowish red(5YR5/8); Structure=Single grain & compact; Pore=Few & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Moderate; Plasticity=No; Stickness =No; Wetness=Dry; Roots=Very few & very fine.
B2	70-100+	Texture=Sandy clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Red (2.5YR4/6); Structure=Single grain & compact; Pore=Few & fine; Oxidative sediments=No; Mn=No; Fe2+=No; Hardness=Hard; Plasticity=No; Stickness=No; Wetness=Dry; Roots=No.

Symbol of Survey Site : B-36

Information on the Soil Site

1. Location	:	10. Parent material or mode of deposition	: Sand stone
2. Elevation	:	11. Vegetation	: Evergreen forest
3. Land use	:	12. Application of fertilizer:	
4. Weather of Examination	:	13. Drainage	: Well
5. Precipitation	:	14. Date	: 08/05/1995
6. Slope	:	15. Surveyer	: JICA Survey Team
7. Erosion	:	16. Soil group	: Soil Code 5- Lithic Acrisols
8. Topography	:	9. Geology	

Soil Profile

Horizon	Depth	Description
A	0-15 cm	Texture=Loamy sand; Gravel & stone=No; Humus=1-2%; Peat muck=No; Color=Dark yellowish brown (10YR3/4); Structure=Single grain & compact; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Moderate; Plasticity=No; Plastic; Stickness=No; Wetness=Dry; Roots=Moderate & fine.
B11	15-50	Texture=Sandy clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark yellowish brown (10YR4/6); Structure=Sub-rounded & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Moderate; Plasticity=No; Stickness=No; Wetness=Dry; Roots=Moderate & fine.
B12	50-100+	Texture=Sandy clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown(7.5YR5/6); Structure=Sub-rounded & fine; Pore=Very few & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Moderate; Plasticity=No; Stickness=No; Wetness=Dry; Roots=Few & very fine.

Symbol of Survey Site : B-37

Information on the Soil Site

1. Location	: B NONGUPHANOUAN	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 820mMSL	11. Vegetation	: Evergreen forest
3. Land use	: Evergreen forest	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 02/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 7- Dystric Nitisols
8. Topography	: Rolling		
9. Geology			

Soil Profile

Horizon	Depth cm	Description
A	0-20	Texture=Silty clay loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=moist; Roots=Many & fine.
AB	20-60	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown (7.5YR4/6); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Moderate & fine.
B	60-100	Texture=Silty clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown (7.5YR4/6); Structure=Sub-rounded & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Few & fine.

Symbol of Survey Site : B-38

Information on the Soil Site

1. Location	: B CUPAXA	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 840mMSL	11. Vegetation	: Upland rice
3. Land use	: Upland rice	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 03/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 7- Dystric Nitisols
8. Topography	: Very gently sloping		
9. Geology			

Soil Profile (is same as P-37)

Horizon	Depth cm	Description
A	0-20	Texture=Silty clay loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=moist; Roots=Many & fine.
AB	20-60	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown (7.5YR4/6); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Moderate & fine.
B	60-100	Texture=Silty clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown (7.5YR4/6); Structure=Sub-rounded & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Few & fine.

Symbol of Survey Site : B-39

Information on the Soil Site

1. Location	: NONGMEK	10 Parent material or mode of deposition	: Basalt
2. Elevation	: 900mMSL	11. Vegetation	: Evergreen forest
3. Land use	: Evergreen forest	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 08/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 5- Lithic Acrisols
8. Topography	: Gently sloping		
9. Geology			

Soil Profile

Horizon	Depth cm	Description
A	0-18	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR4/3); Structure=Granular & fine; Pore=Few & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
AB	18-45	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown (7.5YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & moderate.
B	45-75	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown(7.5YR4/4); Structure=Granular & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & very fine.
	75+	Gravel & stone = >80% of basaltic fragments(2-20cm in size).

Symbol of Survey Site : B-40

Information on the Soil Site

1. Location	: B.NONGTAY	10 Parent material or mode of deposition	: Basalt
2. Elevation	: 900mMSL	11. Vegetation	: Clear forest & rice
3. Land use	: C Clear forest & rice	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 08/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil code 6-Dystric Nitisols
8. Topography	: Gently sloping		
9. Geology			

Soil Profile (is almost same as B-39)

Horizon	Depth cm	Description
A	0-18	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR4/3); Structure=Granular & fine; Pore=Few & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
AB	18-45	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown (7.5YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & moderate.
B	45-80	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown(7.5YR4/4); Structure=Granular & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & very fine.
	80+	Gravel & stone = >80% of basaltic fragments(2-20cm in size).

Symbol of Survey Site : B-41

Information on the Soil Site

1. Location	: HOUAYKONG	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 900mMSL	11. Vegetation	: Evergreen forest & rice
3. Land use	: Upland field	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 08/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 5- Lthic Acrisols
8. Topography	: Gently sloping		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-15 cm	Texture=Silty loam; Gravel & stone=No; Humus=2-5%; Peat muck=No; Color=Dark brown (7.5YR4/3); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; plasticity=Very Plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
B1	15-35	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown (7.5YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & medium.
B2	35-90	Texture=Silty loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown(7.5YR4/3); Structure=Granular & fine; Pore=Many & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Slightly sticky; Wetness=Moist; Roots=Many & very fine.

Symbol of Survey Site : B-42

Information on the Soil Site

1. Location	: B NONGTAY	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 900mMSL	11. Vegetation	: Clear forest & rice
3. Land use	: Clear forest & rice	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 08/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil code 6-Dystric Nitosols
8. Topography	: Gently sloping		
9. Geology			

Soil Profile (is almost same as B-39)

Horizon	Depth	Description
A	0-18 cm	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR4/3); Structure=Granular & fine; Pore=Few & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
AB	18-45	Texture=Silty clay loam Loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown (7.5YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & moderate.
B	45-80	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown(7.5YR4/4); Structure=Granular & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & very fine.
	80+	Gravel & stone=>80% of basaltic fragments(2-20cm in size)



Symbol of Survey Site : B-43

Information on the Soil Site (is same as B-42)

1. Location	: B HOUAY KONO	10 Parent material or mode of deposition	: Basalt
2. Elevation	: 940mMSL	11. Vegetation	: Clear forest & rice
3. Land use	: Clear forest & rice	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Data	: 09/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil code 6-Dystric Nitosols
8. Topography	: Gently sloping		
9. Geology			

Soil Profile (is almost same as B-39)

Horizon	Depth cm	Description
A	0-18	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR4/3); Structure=Granular & fine; Pore=Few & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
AB	18-45	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown (7.5YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & moderate.
B	45-80	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown(7.5YR4/4); Structure=Granular & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & very fine.
	80+	Gravel & stone= >80% of basaltic fragments(2-20cm in size).

Symbol of Survey Site : B-44

Information on the Soil Site

1. Location	: B NONGKIN	10 Parent material or mode of deposition	: Basalt
2. Elevation	: 990mMSL	11. Vegetation	: Clear forest & grassland
3. Land use	: Clear forest & grassland	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: No	14. Data	: 09/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil code 6-Dystric Nitosols
8. Topography	: Gently sloping		
9. Geology			

Soil Profile (is almost same as B-43)

Horizon	Depth cm	Description
A	0-18	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR4/3); Structure=Granular & fine; Pore=Few & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
AB	18-45	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown (7.5YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & moderate.
B	45-80	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown(7.5YR4/4); Structure=Granular & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & very fine.
	80+	Gravel & stone= >80% of basaltic fragments(2-20cm in size).

Symbol of Survey Site : B 45

Information on the Soil Site

1. Location	: B.NONGKHUANG	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 1080mMSL	11. Vegetation	: Clear forest & grassland
3. Land use	: Clear forest & grassland	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 09/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 8- Lithic Nitosols
8. Topography	: Gently sloping		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-20 cm	Texture=Silty clay loam; Gravel & stone=5-10% of basaltic fragments(2-20cm in size); Humus=2-3%; Peat muck=No; Color=brown (7.5YR3/4); Structure=Granular & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=moist; Roots=Many & fine.
C	20+	Gravel & stone=>80% of basaltic fragments(2-20cm in size).

Symbol of Survey Site : B 46

Information on the Soil Site

1. Location	: B.NONGKHUANG	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 1235mMSL	11. Vegetation	: Grassland & clear forest
3. Land use	: Grassland & clear forest	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 09/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 8- Lithic Nitosols
8. Topography	: Gently sloping		
9. Geology			

Soil Profile (is same as P-20)

Horizon	Depth	Description
A	0-15 cm	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (10YR4/2); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=moist; Roots=Many & fine.
B1	15-40	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown (7.5YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Moderate & fine.
B2	40-75	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown(7.5YR4/6); Structure=Granular & very fine; Pore=Moderate & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very Stickness=Very sticky; Wetness=Moist; Roots=Few & very fine.
B3	75+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown (7.5YR4/6); Pore=Granular & fine; Pore= Moderate & very fine;Oxidative sediments (Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness= Moist; Roots=Few & very fine.

Symbol of Survey Site : B-47

Information on the Soil Site

1. Location	: B.LAK 15	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 1180mMSL	11. Vegetation	: Grassland & clear forest
3. Land use	: Grassland & clear forest	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 09/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 8- Lithic Nitosols
8. Topography	: Very gently sloping		
9. Geology			

Soil Profile (is same as P-20)

Horizon	Depth	Description
A	0-15 <sup>cm</sup>	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (10YR4/2); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=moist; Roots=Many & fine.
B1	15-40	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown (7.5YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Moderate & fine.
B2	40-75	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown(7.5YR4/6); Structure=Granular & very fine; Pore=Moderate & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Few & very fine.
B3	75+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown (7.5YR4/6); Pore=Granular & fine; Pore= Moderate & very fine;Oxidative sediments (Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness= Moist; Roots=Few & very fine.

Symbol of Survey Site : B-48

Information on the Soil Site

1. Location	: B.LAK 11	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 1230mMSL	11. Vegetation	: Grassland & clear forest
3. Land use	: Grassland & clear forest	12. Application of fertilizer:	
4. Weather of Examination	: Fine	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 09/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 8- Lithic Nitosols
8. Topography	: Gently sloping		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-15 <sup>cm</sup>	Texture=Silty loam; Gravel & stone=No; Humus=%; Peat muck=No; Color=Dark brown (10YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=moist; Roots=Many & fine.
AB	15-40	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark yellowish brown (10YR4/6); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
Bt1	40-70	Texture=Clay loam; Gravel & stone=3-5% of Iron concretions(2-10mm); Humus=No; Peat muck=No; Color=Dark yellowish brown(10YR4/6); Structure=Sub-rounded & fine; Pore=Few & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=Exist; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=v.few & v.fine.
Bt2	70+	Texture=Clay; Gravel & stone=3-5% of Iron concretions; Humus=No; Peat muck=No; D.Y.brown(7.5YR4/6); Structure=Sub-rounded & fine; Pore=Few & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=Exist; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness= Moist; Roots=Few & very fine.

Symbol of Survey Site : B-49

Information on the Soil Site

1. Location	: BLAK 9	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 1270mMSL	11. Vegetation	: Grassland
3. Land use	: Grassland	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 09/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 8- Lithic Nitosols
8. Topography	: Almost flat		
9. Geology			

Soil Profile (is same as B-48)\*

Horizon	Depth	Description
A	0-15 cm	Texture=Silty loam; Gravel & stone=No; Humus=1-2%; Peat muck=No; Color=Dark brown (10YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=moist; Roots=Many & fine.
AB	15-40	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark yellowish brown (10YR4/6); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
Bt1	40-70	Texture=Clay loam; Gravel & stone=3-5% of Iron concretion(2-10mm); Humus=No; Peat muck=No; Color=Dark yellowish brown(10YR4/6); Structure=Sub-rounded & fine; Pore=Few & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=Exist; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=V.few & v.fine.
Bt2	70+	Texture=Clay; Gravel & stone=3-5% of Iron concretion; Humus=No; Peat muck=No; D.Y.brown(7.5YR4/6); Structure=Sub-rounded & fine; Pore=Few & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=Exist; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness= Moist; Roots=Few & very fine.

\*Concretions of 2-20mm in size are found in concentration of 5-8% from the horizon of 40cm-depth.

Symbol of Survey Site : B-50

Information on the Soil Site

1. Location	:	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 1290mMSL	11. Vegetation	: Grassland
3. Land use	: Grassland	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 09/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 8- Lithic Nitosols
8. Topography	: Almost flat		
9. Geology			

Soil Profile (is same as B-48)\*

Horizon	Depth	Description
A	0-20 cm	Texture=Silty clay loam; Gravel & stone=No; Humus=1-2%; Peat muck=No; Color=Dark brown (10YR3/3); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=moist; Roots=Moderate & fine.
Bt1	20-50	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown (7.5YR4/4); Structure=Sub-rounded & fine; Pore=Moderate & fine; Oxidative sediments (Salts)=No; Mn=No; Fe2+=No; Hardness=Medium; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Few & fine.
Bt2	50-80	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Yellowish red (5YR5/6); Structure=Sub-rounded & fine; Pore=Few & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Medium; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Very few & very fine.
Bt3	80-100+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Yellowish red (5YR5/8); Structure=Sub-rounded & fine; Pore=Very few & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Hard; Plasticity=Slightly plastic; Stickness=Very sticky; Wetness= Moist; Roots=No.

Symbol of Survey Site : B-51

Information on the Soil Site

1. Location	: B.PAKKONG	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 1316mMSL	11. Vegetation	: Grassland
3. Land use	: Grassland	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 09/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 8- Lithic Nitisols
8. Topography	: Almost flat		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-15 cm	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=moist; Roots=Many & fine.
Bt1	15-50	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown (7.5YR4/6); Structure=Sub-rounded & fine; Pore=Few & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Few & fine.
Bt2	50-80	Texture=Clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Reddish brown(5YR4/4); Structure=Sub-rounded & fine; Pore=Very few & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Medium; Wetness=Moist; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Very few & very fine.
Bt3	80-100+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Yellowish red (5YR4/6); Structure=Angular & fine; Pore=Very few & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Hard; Plasticity=Slightly plastic; Stickness=Very sticky; Wetness= Moist; Roots=No.

Symbol of Survey Site : B-52

Information on the Soil Site

1. Location	: B.LAKS	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 1310mMSL	11. Vegetation	: Grassland
3. Land use	: Grassland	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 09/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Moderately	16. Soil group	: Soil Code 8- Lithic Nitisols
8. Topography	: Slightly sloping		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-15 cm	Texture=Silty clay loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark yellowish brown (10YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=moist; Roots=Many & fine.
Bt	15-45	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown(7.5YR4/4); Structure=Granular & fine; Pore=Few & fine; Oxidative sediments (Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Moderate & fine.
Bts1	45-80	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown (7.5YR4/6); Structure=Sub-rounded & fine; Pore=Very few & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=3-5% of concretion(2-15mm); Hardness=Medium; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Few & very fine.
Bts2	80+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown (7.5YR5/6); Structure=Angular & fine; Pore=No; Oxidative sediments(Salts)=No; Mn=No; Fe2+=5-10% of concretion; Hardness=Hard; Plasticity=Very plastic; Stickness=Very sticky; Wetness= Moist; Roots=Very few & very fine.

Symbol of Survey Site : B-53

Information on the Soil Site

1. Location	: BLAK 5	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 1303mMSL	11. Vegetation	: Grassland
3. Land use	: Grassland	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 09/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Moderately	16. Soil group	: Soil Code 8- Lithic Nitisols
8. Topography	: Slightly sloping		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-15 cm	Texture=Silty clay loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=moist; Roots=Many & fine.
Bt	15-45	Texture=Clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Reddish brown(5YR4/4); Structure=Sub-rounded & fine; Pore=Few & fine; Oxidative sediments (Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Moderate & fine.
C	45+	Gravel & stone= >80% of basaltic fragments(2-30cm in size).
Bt2	80+	

Symbol of Survey Site : B-54

Information on the Soil Site

1. Location	: BLATBOK	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 350mMSL	11. Vegetation	: Banana, papaya & forest
3. Land use	: Mixed deciduous forest	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: Rain	14. Date	: 10/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Moderately	16. Soil group	: Soil Code 6- Dystric Nitisols
8. Topography	: Undulating		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-35 cm	Texture=Silty clay loam; Gravel & stone=Exist; Humus=2-3%; Peat muck=No; Color=reddish brown (5YR3/3); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=moist; Roots=Many & fine.
C	35+	Gravel & stone= >80% of basalt & iron concretions(2-30cm in size).

Symbol of Survey Site : B-55

Information on the Soil Site

1. Location	: B.THONGSALA	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 220mMSL	11. Vegetation	: Banana, papaya & forest
3. Land use	: Mixed deciduous forest	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: Rain	14. Date	: 10/05/1995
6. Slope	: 8-16%	15. Surveyer	: JICA Survey Team
7. Erosion	: Moderately	16. Soil group	: Soil Code 6- Dystric Nitisols
8. Topography	: Undulating to rolling		
9. Geology			

Soil Profile (is same as B-54) \*

Horizon	Depth	Description
A	0-35 cm	Texture=Silty clay loam; Gravel & stone=Exist; Humus=2-3%; Peat muck=No; Color=reddish brown (5YR3/3); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=moist; Roots=Many & fine.
C	35+	Gravel & stone= >80% of basalt & iron concretions(2-30cm in size).

\*Rock out crop occurs on the surface and iron concretion up to 15-20%(>80% of basalt rocks of 2-30cm).

Symbol of Survey Site : B-56

Information on the Soil Site

1. Location	: B.KENGGNAO	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 190mMSL	11. Vegetation	: Paddy rice
3. Land use	: Paddy field	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: Rain	14. Date	: 10/05/1995
6. Slope	: 0-2%	15. Surveyer	: JICA Survey Team
7. Erosion	: No	16. Soil group	: Soil Code 8- Lithic Nitisols
8. Topography			
9. Geology			

Soil Profile

Horizon	Depth	Description
Ap	0-15 cm	Texture=Clay loam; Gravel & stone=No; Humus=1-2%; Peat muck=No; Color=Dark (10YR5/1); Structure=Angular & coarse; Pore=Very few & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Medium; Plasticity=Slightly plastic; Stickness=Very sticky; Wetness=moist; Roots=Very few & very fine.
AB	15-40	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Gray (10YR5/1); Structure=Angular & coarse; Pore=Very few & very fine; Oxidative sediment (Salts)=No; Mn=No; Fe2+=No; Hardness=Medium; Plasticity=Slightly plastic; Stickness=Very sticky; Wetness=Moist; Roots=Very few & very fine.
Btg1	40-80	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Light yellowish brown(10YR6/4); Structure=Angular & coarse; Pore=No; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Medium; Plasticity=Slightly plastic; Stickness=Very sticky; Wetness=Moist; Roots=No.
Btg2	80+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Light yellowish brown(10YR6/4); Structure=Angular & coarse; Pore=No; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Hard; Plasticity=Slightly plastic; Stickness=Very Wetness= Moist; Roots=No.

Symbol of Survey Site : B-57

Information on the Soil Site

1. Location	: B.THONGKIM	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 295mMSL	11. Vegetation	: Mixed deciduous forest
3. Land use	: Mixed deciduous forest	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: Rain	14. Data	: 10/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Moderately	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Undulating		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-20 <sup>cm</sup>	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR4/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Medium; Plasticity=Very plastic; Stickness=Very sticky; Wetness=moist; Roots=Many & fine.
B1	20-60	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown (7.5YR4/6); Structure=Sub-rounded & fine; Pore=Medium & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Hard; Plasticity=No; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
B2	60-100	Texture=Clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown(7.5YR4/6); Structure=Sub-rounded & medium; Pore=Few & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2=No; Hardness=Hard; Plasticity=Moderately plastic; Stickness=Very sticky; Wetness=Moist; Roots=Few & fine.

Symbol of Survey Site : B-58

Information on the Soil Site

1. Location	: B.NONGBOK	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 220mMSL	11. Vegetation	: Mixed deciduous forest
3. Land use	: Mixed deciduous forest	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: Rain	14. Data	: 10/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Undulating		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-20 <sup>cm</sup>	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=moist; Roots=Many & fine.
B1	20-60	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Reddish brown (5YR4/4); Structure=Sub-rounded & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Hard; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
B2	60-100	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Yellowish red (5YR4/6); Structure=Sub-rounded & medium; Pore=Few & lvery fine; Oxidative sediments(Salts)=No; Mn=No; Fe2=No; Hardness=Hard; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & very fine.



Symbol of Survey Site : B-59

Information on the Soil Site

1 Location	: BBACHIANO	10 Parent material or mode of deposition	: Basalt
2 Elevation	: 230mMSL	11 Vegetation	: Clear forest
3 Land use	: Clear forest	12 Application of fertilizer:	
4 Weather of Examination	: Cloudy	13 Drainage	: Well
5 Precipitation	: No	14 Date	: 10/05/1995
6 Slope	: 2-8%	15 Surveyer	: JICA Survey Team
7 Erosion	: Moderately	16 Soil group	: Soil Code 6- Dystric Nitosols
8 Topography	: Undulating		
9 Geology			

Soil Profile

Horizon	Depth	Description
A	0-15 cm	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark yellowish brown (5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=moist; Roots=Many & fine.
AB	15-40	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Yellowish red (5YR4/6); Structure=Sub-rounded & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
Bt	40-80	Texture=Clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Yellowish red(5YR4/6); Structure=Angular & fine; Pore=Few & very fine; Oxidative sediments (Salts)=No; Mn=No; Fe2+=No; Hardness=Medium; Plasticity=Slightly plastic; Stickness=Very sticky; Wetness=Dry; Roots=Moderate & very fine.
Bts	80+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Yellowish red (5YR4/6); Structure=Angular & fine; Pore=Very few & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Hard; Plasticity=Slightly plastic; Stickness=Very sticky; Wetness= Dry; Roots=Few & very fine.

Symbol of Survey Site : B-60

Information on the Soil Site

1 Location	: B PHOLAT	10 Parent material or mode of deposition	: Basalt
2 Elevation	: 250mMSL	11 Vegetation	: Grassland
3 Land use	: Mixed deciduous forest	12 Application of fertilizer:	
4 Weather of Examination	: Cloudy	13 Drainage	: Well
5 Precipitation	: No	14 Date	: 09/05/1995
6 Slope	: 2-8%	15 Surveyer	: JICA Survey Team
7 Erosion	: Slightly	16 Soil group	: Soil Code 6- Dystric Nitosols
8 Topography	: Slightly sloping		
9 Geology			

Soil Profile

Horizon	Depth	Description
A	0-20 cm	Texture=Silty clay loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark reddish brown (2.5YR3/2); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
Bt	20-60	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown(2.5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
B2	60-100+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark red (2.5YR3/6); Structure=Sub-rounded & fine; Pore=Moderate & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=3-5% of concretion(2-15mm); Hardness=Medium; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Moderate & v.fine.

Symbol of Survey Site : B-61

Information on the Soil Site

1. Location	: B MONANGKHAI	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 290mMSL	11. Vegetation	: Kapok & rice
3. Land use	: Mixed deciduous forest	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 10/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Slightly sloping		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-15 cm	Texture=Silty clay loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark reddish brown (2.5YR3/3); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
AB	15-40	Texture=Clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown (2.5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & medium.
B1	40-80	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown(2.5YR3/4); Structure=Granular & fine; Pore=Moderate & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Moderate & fine.
B2	80+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown(2.5YR3/4); Structure=Granular & fine; Pore=Very Moderate & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness= Dry; Roots=Few & very fine.

Symbol of Survey Site : B-62

Information on the Soil Site

1. Location	: B KENGLAI	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 350mMSL	11. Vegetation	: Rice & M. deciduous forest
3. Land use	: M. deciduous forest & rice	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 10/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Slightly sloping		
9. Geology			

Soil Profile (is same as B-60)

Horizon	Depth	Description
A	0-20 cm	Texture=Silty clay loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark reddish brown (2.5YR3/2); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
B1	20-60	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown(2.5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
B2	60-100+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark red (2.5YR3/6); Structure=Sub-rounded & fine; Pore=Moderate & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=3-5% of concretion(2-15mm); Hardness=Medium; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Moderate & v.fine.

Symbol of Survey Site : B-63

Information on the Soil Site

1. Location	: B.DHIN	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 430mMSL	11. Vegetation	: Rice & durian tree
3. Land use	: Rice & durian tree	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 10/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Undulating		
9. Geology			

Soil Profile (is same as B-62)

Horizon	Depth	Description
A	0-15 cm	Texture=Silty clay loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark reddish brown (2.5YR3/3); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
AB	15-40	Texture=Clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown (2.5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & medium.
B1	40-80	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown(2.5YR3/4); Structure=Granular & fine; Pore=Moderate & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Moderate & fine.
B2	80+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown(2.5YR3/4); Structure=Granular & fine; Pore=Very Moderate & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness= Dry; Roots=Few & very fine.

Symbol of Survey Site : B-64

Information on the Soil Site

1. Location	: B.NONGBOUATHONG	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 250mMSL	11. Vegetation	: Banana, durian & cle forest
3. Land use	: Banana, durian & cle forest	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 10/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitosols
8. Topography	: Gently sloping		
9. Geology			

Soil Profile (is same as B-63)

Horizon	Depth	Description
A	0-20 cm	Texture=Silty clay loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark reddish brown (2.5YR3/2); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
B1	20-60	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown(2.5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
B2	60-100+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark red (2.5YR3/6); Structure=Sub-rounded & fine; Pore=Moderate & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=3-5% of concretion(2-15mm); Hardness=Medium; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Moderate & v. fine.

Symbol of Survey Site : B-65

Information on the Soil Site

1. Location	: B.NONSAAV	10 Parent material or mode of deposition	: Basalt
2. Elevation	: 290mMSL	11. Vegetation	: Rice & durian tree
3. Land use	: Scrub forest & clear forest	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: No	14. Data	: 10/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 6- Dystric Nitisols
8. Topography	: Undulating		
9. Geology			

Soil Profile (is same as B-64)

Horizon	Depth	Description
A	0-15 cm	Texture=Silty clay loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark reddish brown (2.5YR3/3); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
AB	15-40	Texture=Clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown (2.5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & medium.
B1	40-80	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown(2.5YR3/4); Structure=Granular & fine; Pore=Moderate & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Moderate & fine.
B2	80+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown(2.5YR3/4); Structure=Granular & fine; Pore=Very Moderate & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Few & very fine.

Symbol of Survey Site : B-66

Information on the Soil Site

1. Location	: B LAK23 (B.HOUAYAMOUANG)	9. Geology	
2. Elevation	: 250mMSL	10 Parent material or mode of deposition	: Basalt
3. Land use	: Banana, durian & cle forest	11. Vegetation	: Banana, durian & cle forest
4. Weather of Examination	: Cloudy	12. Application of fertilizer:	
5. Precipitation	: No	13. Drainage	: Well
6. Slope	: 2-8%	14. Data	: 10/05/1995
7. Erosion	: Slightly	15. Surveyer	: JICA Survey Team
8. Topography	: Gently sloping	16. Soil group	: Soil Code 6- Dystric Nitisols

Soil Profile (is same as B-63)

Horizon	Depth	Description
A	0-20 cm	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark reddish brown (5YR3/3); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
B1	20-60	Texture=Clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark reddish brown(5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & very fine.
B2	60-100+	Texture=Clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark red brown(5YR3/4); Structure=Granular & fine; Pore=Few & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & very fine.

Symbol of Survey Site : B 67

Information on the Soil Site

1 Location	: B 1AK28	10 Parent material or mode of deposition	: Basalt
2 Elevation	: 680mMSL	11 Vegetation	: Durian & coffee
3 Land use	: Durian & coffee	12 Application of fertilizer:	
4 Weather of Examination	: Cloudy	13 Drainage	: Well
5 Precipitation	: No	14 Date	: 10/05/1995
6 Slope	: 2-8%	15 Surveyer	: JICA Survey Team
7 Erosion	: Slightly	16 Soil group	: Soil Code 6- Dystric Nitosols
8 Topography	: Undulating		
9 Geology			

Soil Profile

Horizon	Depth cm	Description
A	0-25	Texture=Silty clay loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
B1	25-65	Texture=Clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown (7.5YR4/6); Structure=Granular & fine; Pore=Moderate & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & medium.
B2	65-100+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown (7.5YR4/6); Structure=Granular & fine; Pore=Moderate & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.

Symbol of Survey Site : B 68

Information on the Soil Site

1 Location	: B KAK36(B PHIAKKOUJ)	10 Parent material or mode of deposition	: Basalt
2 Elevation	: 900mMSL	11 Vegetation	: Tea, coffee & durian
3 Land use	: Tea, coffee & durian	12 Application of fertilizer:	
4 Weather of Examination	: Cloudy	13 Drainage	: Well
5 Precipitation	: No	14 Date	: 10/05/1995
6 Slope	: 2-8%	15 Surveyer	: JICA Survey Team
7 Erosion	: Slightly	16 Soil group	: Soil Code 6- Dystric Nitosols
8 Topography	: Rolling		
9 Geology			

Soil Profile (is same as B-63)

Horizon	Depth cm	Description
A	0-20	Texture=Silty loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
B1	20-60	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark yellowish brown(10YR4/6); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Many & fine.
B2	60-90	Texture=Silty clay loam; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark yellowish brown(10YR4/6); Structure=Granular & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Dry; Roots=Moderate & fine.
Bis	90+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark yellowish brown(10YR4/6); Structure=Sub-rounded & fine; Pore=Few & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=3-5% of iron concretion(2-10mm); Hardness=Soft; Plasticity=Slightly plastic; Stickness=Very sticky; Wetness=Dry; Roots=Few & very fine.

Symbol of Survey Site : B-69

Information on the Soil Site

1. Location	: B.LAK47	10. Parent material or mode of deposition	: Basalt
2. Elevation	: 1200mMSL	11. Vegetation	: Tea & coffee
3. Land use	: Tea & coffee	12. Application of fertilizer:	
4. Weather of Examination	: Cloudy	13. Drainage	: Well
5. Precipitation	: No	14. Date	: 12/05/1995
6. Slope	: 2-8%	15. Surveyer	: JICA Survey Team
7. Erosion	: Slightly	16. Soil group	: Soil Code 8- Lithic Nitisols
8. Topography	: Rolling		
9. Geology			

Soil Profile

Horizon	Depth	Description
A	0-20 cm	Texture=Clay loam; Gravel & stone=No; Humus=2-3%; Peat muck=No; Color=Dark brown (7.5YR3/4); Structure=Granular & fine; Pore=Many & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Soft; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
B1	20-60	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Dark brown (7.5YR4/4); Structure=Sub-rounded & fine; Pore=Moderate & fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Medium; Plasticity=Slightly plastic; Stickness=Very sticky; Wetness=Moist; Roots=Many & fine.
B2	60-100+	Texture=Clay; Gravel & stone=No; Humus=No; Peat muck=No; Color=Strong brown (7.5YR4/6); Structure=Sub-rounded & fine; Pore=Few & very fine; Oxidative sediments(Salts)=No; Mn=No; Fe2+=No; Hardness=Hard; Plasticity=Very plastic; Stickness=Very sticky; Wetness=Moist; Roots=Moderate & very fine.

**Table 1.3 Soil Description of Pit Profiles**

Sample No	General information	Depth	Color	Texture	Structure	Plasticity	pH(1:120)	
P-1	Elevation	:1290mMSL	0-15	5YR3/3	Light loam	Gr.	Very	5.5
	Land use	:Grassland	15-50	7.5YR4/6	Silty loam	Gr.	Very	6.0
	Slope	:0-2%	50-100	7.5YR5/6	Clay	Gr.	Very	7.0
	Topography	:Almost flat						
	Parent material	:Basalt						
	Soil group	:Lithic Nitosols						
P-2	Elevation	:900mMSL	0-15	5YR3/3	Light loam	Gr.	Very	6.5
	Land use	:Coffee garden	15-60	7.5YR4/6	Silty loam	Gr.	Very	6.5
	Slope	:8-16%	60-100	7.5YR5/6	Clay	Gr.	Very	6.3
	Topography	:Foot slope						
	Parent material	:Basalt						
	Soil group	:Dystric Nitosols						
P-3	Elevation	:1120mMSL	0-20	5YR3/3	Light loam	Gr. & fine	Slightly	4.6
	Land use	:Coffee garden	20-55	5YR4/4	Silty clay loam	Gr. & fine	Slightly	5.0
	Slope	:16-25%	55-100	5YR4/6	Clay loam	Gr. & fine	Very	6.5
	Topography	:Moderately sloping						
	Parent material	:Basalt						
	Soil group	:Dystric Nitosols						
P-4	Elevation	:530mMSL	0-20	5YR3/3	Silty loam	Gr. & fine	Very	6.5
	Land use	:Rice	20-60	5YR3/4	Silty clay loam	Gr. & fine	Very	5.5
	Slope	:0-2%	60-100	5YR4/4	Clay	Gr. & fine	Very	5.5
	Topography	:Gently sloping						
	Parent material	:Basalt						
	Soil group	:Dystric Nitosols						
P-5	Elevation	:685mMSL	0-15	5YR3/4	Silty clay loam	Gr. & very fine	Very	6.7
	Land use	:Grassland	15-60	5YR4/4	Silty clay	Gr. & very fine	Very	5.2
	Slope	:2-8%	60-100	5YR4/6	Clay	Gr. & fine	Very	5.5
	Topography	:Gently sloping						
	Parent material	:Basalt						
	Soil group	:Dystric Nitosols						
P-6	Elevation	:1010mMSL	0-15	5YR3/2	Silty clay loam	Gr. & very fine	Very	7.2
	Land use	:Coffee & forest	15-30	5YR3/3	Silty clay	Gr. & very fine	Very	7
	Slope	:2-8%	30+		Clay			
	Topography	:Undulating						
	Parent material	:Basalt						
	Soil group	:Lithic Nitosols						
P-7	Elevation	:225mMSL	0-15	10YR6/4	Loamy sand	No structure	No	6.2
	Land use	:Paddy field	15-35	10YR7/3	Silty loam	Sub-angular	Slightly	5.9
	Slope	:0-2%	35-55	10YR6/4	Silty clay loam	Sub-angular	Slightly	5.6
	Topography	:Flat	55-75	10YR5/4	Clay Loam	Sub-angular	Slightly	5.5
	Parent material	:Sand stone	75+	10YR5/4	Loamy clay			
	Soil group	:Lithic Nitosols						
P-8	Elevation	:920mMSL	0-15	7.5YR3/3	Silty clay loam	Gr. & very fine	Very	7.2
	Land use	:Forest, coffee, etc.	15-60	10YR4/4	Clay	Gr. & fine	Very	6.7
	Slope	:2-8%	60-100	5YR4/6	Clay	Gr. & fine	Very	6.2
	Topography	:Very gently slope						
	Parent material	:Basalt						
	Soil group	:Lithic nitosols						

Sample No	General information	Depth	Color	Texture	Structure	Plasticity	pH(1120)	
P-9	Elevation	:690 m MSL	0-20	10YR3/3	Silty clay	Gr. & very fine	Very	6.7
	Land use	:Coffee garden	20-60	7.5YR4/6	Silty clay loam	Gr. & fine	Very	6.6
	Slope	:2-8%	60-100	7.5YR4/4	Clay	Gr. & fine	Very	6.5
	Topography	:Very gently slope						
	Parent material	:Basalt						
	Soil group	:Dystric Nitisols						
P-10	Elevation	:580mMSL	0-20	7.5YR3/4	Silty loam	Gr. & fine	Very	5.3
	Land use	:Coffee garden	20-60	2.5YR3/4	Silty clay loam	Gr. & fine	Very	5.5
	Slope	:0-2%	60-100	2.5YR3/4	clay	Gr. & fine	Very	5.5
	Topography	:Very gentle slope						
	Parent material	:Basalt						
	Soil group	:Dystric nitisols						
P-11	Elevation	:290mMSL	0-20	5YR3/4	Clay loam	Gr.& fine	Very	6.7
	Land use	:Evergreen forest	20-60	2.5YR3/4	Clay loam	Gr. & fine	Very	5.7
	Slope	:2-8%	60-100	2.5YR3/4	Clay	Gr. & fine	Very	6.2
	Topography	:Undulating						
	Parent material	:Basalt						
	Soil group	:Dystric Nitisols						
P-12	Elevation	:390mMSL	0-18	7.5YR4/4	Silty loam	Gr. & fine	Very	7.0
	Land use	:Scrub forest	18-45	2.5YR4/4	Light loam	Gr. & fine	Very	6.7
	Slope	:2-8%	45-80	2.5YR3/4	Silty clay loam	Gr. & fine	Very	5.7
	Topography	:Undulating						
	Parent material	:Basalt						
	Soil group	:Dystric Nitisols						
P-13	Elevation	:360mMSL	0-20	5YR3/3	Silty clay loam	Gr. & fine	Very	7.0
	Land use	:Evergreen forest	20+					
	Slope	:2-8%						
	Topography	:Undulating						
	Parent material	:Basalt						
	Soil group	:Lithic Nitisols						
P-14	Elevation	:620mMSL	0-15	5YR3/4	Silty clay loam	Gr. & fine	Very	5.5
	Land use	:Coffee garden	15-40	2.5YR3/4	Silty clay	Gr. & fine	Very	5.4
	Slope	:0-2%	40-80	2.5YR3/4	Clay	Gr. & fine	Very	5.5
	Topography	:Gentle sloping	80-100	2.5YR3/4	Clay loam	Gr.	Very	5.5
	Parent material	:Basalt						
	Soil group	:Dystric nitisols						
P-15	Elevation	:420mMSL	0-15	5YR3/2	Silty clay	Gr. & fine	Very	7.2
	Land use	:Banana garden	15+					
	Slope	:2-8%						
	Topography	:Undulating						
	Parent material	:Basalt						
	Soil group	:Lithic Nitisols						
P-16	Elevation	:1060mMSL	0-15	10YR3/3	Silty loam	Gr. & fine	Very	5.4
	Land use	:Coffee garden	15-50	7.5YR3/4	Silty loam	Gr. & fine	Very	5.5
	Slope	:2-8%	50-80	7.5YR4/4	Silty clay loam	Gr. & fine	Very	5.2
	Topography	:Slightly sloping	80-100	7.5YR4/4	Clay	Gr.	Very	6.6
	Parent material	:Basalt						
	Soil group	:Dystric Nitisols						
P-17	Elevation	:1290mMSL	0-15	7.5YR3/4	Silty loam	Gr. & fine	Very	5.4
	Land use	:Grassland	15+					
	Slope	:2-8%						
	Topography	:Undulating						
	Parent material	:Basalt						
	Soil group	:Dystric Nitisols						



Sample No	General information		Depth	Color	Texture	Structure	Plasticity	pH(H <sub>2</sub> O)
P-18	Elevation	:900mMSL	0-15	1.6YR4/3	Loamy sand	Sub-rounded	No	5.3
	Land use	:Paddy field	15-40	10YR7/2	Silty clay loam	Sub-rounded	No	7.2
	Slope	:0-2%	40-75	10YR6/1	Silty clay	Angular	Slightly	7.0
	Topography	:Flat to almost flat	75-110	10YR5/1	Silty clay	Clay	Slightly	
	Parent material	:Basalt						
	Soil group	:Gleylic Acrisols						
P-19	Elevation	:920mMSL	0-15	7.5YR2/3	Silty clay loam	Gr. & fine	Very	6.8
	Land use	:Evergreen forest	15-45	7.5YR4/4	Silty clay loam	Gr. & fine	Very	5.5
	Slope	:2-8%	45-80	7.5YR4/6	Silty loam	Gr. & fine	Very	5.6
	Topography	:Gently sloping	80-100			Soft		
	Parent material	:Basalt						
	Soil group	:Lithic Nitisols						
P-20	Elevation	:1130mMSL	0-15	10YR4/2	Silty loam	Gr. & fine	Very	7.2
	Land use	:Grassland	15-40	7.5YR4/4	Silty clay loam	Gr. & fine	Very	6.6
	Slope	:2-8%	40-75	7.5YR4/6	Silty clay loam	Gr. & fine	Very	6.7
	Topography	:Gently sloping	75-100	7.5YR4/6	Clay	Gr. & fine	Very	
	Parent material	:Basalt						
	Soil group	:Lithic Nitisols						
P-21	Elevation	:530m MSL	0-16	7.5YR3/2	Silty loam	Gr. & fine	Very	5.6
	Land use	:Ground nut,etc.	16-40	7.5YR3/4	Silty clay loam	Gr. & fine	Very	5.5
	Slope	:2-8%	40-75	5YR3/4	Clay loam	Gr. & fine	Very	5.9
	Topography	:Gently sloping	75-100	2.5YR3/6	Clay loam	Sub-rounded	Very	6.0
	Parent material	:Basalt						
	Soil group	:Dystric Nitisols						
P-22	Elevation	:530mMSL	0-28	2.5YR3/3	Silty loam	Gr. & fine	Very	6.7
	Land use	:Cardamom,etc.	28-75	2.5YR3/4	Silty clay loam	Gr. & fine	Slightly	6.8
	Slope	:2-8%	75-120	5YR4/4	Clay	Sub-angular	Slightly	6.5
	Topography	:Gently sloping						
	Parent material	:Basalt						
	Soil group	:Dystric Nitisols						
P-23	Elevation	:225mMSL	0-23	7.5YR4/3	Silty clay loam	Gr. & fine	Very	6.9
	Land use	:Rice,soybean,etc.	23-62	7.5YR4/4	Silty clay	Gr. & fine	Slightly	6.7
	Slope	:2-8%	62-120	7.5YR4/6	Silty clay	Sub-angular	Slightly	6.3
	Topography	:Undulating						
	Parent material	:Basalt						
	Soil group	:Dystric Nitisols						
P-24	Elevation	:1390mMSL	0-20	7.5YR3/4	Silty clay loam	Sub-rounded	Very	5.4
	Land use	:Grassland	20-50	7.5YR4/6	Silty clay loam	Sub-rounded	Very	6.2
	Slope	:0-2%	50-75	7.5YR4/4	Clay	Angular	Very	6.5
	Topography	:Very gently slope	75-100	7.5YR4/4	Clay loam	Sub-rounded	Very	6.5
	Parent material	:Basalt						
	Soil group	:Lithic Nitisols						
P-25	Elevation	:350mMSL	0-28	7.5YR3/4	Silty clay loam	Gr. & fine	Very	5.6
	Land use	:Fruit tree garden	28-50	5YR3/4	Clay loam	Gr. & fine	Very	5.5
	Slope	:2-8%	50-80	7.5YR4/4	Clay	Gr. & fine	Very	6.5
	Topography	:Very gently slope	80-100	7.5YR4/6	Clay	Gr. & fine	Very	6.3
	Parent material	:Basalt						
	Soil group	:Dystric Nitisols						

Table I-4 Chemical Analysis Data of Pit Samples

Sample No.	Symbol of Site	Horizon	Depth cm	pH		Nitrogen		Available	Exchangeable				Available
				H2O	KCl	Ammonia	Nitrate	phosphorus	Potassium	Calcium	Magnesium	Manganese	Iron
						NH4-Nmg 100gSoil	NO3-Nmg 100gSoil	P205-mg 100gSoil	K20-mg 100gSoil	Ca0-mg 100gSoil	Mg0-mg 100gSoil	Ma-ppm	Fe-ppm
1	P-1	A	0-15	5.5	5.5	1	<1	5-10	25	200	50-75	25-50	25-50
2	P-1	B1	15-50	6	5.5	1	<1	5	70	100	25-50	50-75	50-75
3	P-1	B2	50-100	7	6	<1	<1	5	70	200	50-75	50-75	50-75
4	P-2	A	0-15	6.5	5.5	<1	<1	75-100	35	200	25-50	25-50	25-50
5	P-2	AB	15-60	6.5	5.5	<1	<1	5-10	20	200	25-50	25-50	25-50
6	P-2	B	60-100	6.3	6	<1	<1	5	70	200	50-75	50-75	50-75
7	P-3	A	0-20	4.6	4.7	1-5	<1	10-25	20	200	10-50	25-50	25-50
8	P-3	AB	20-55	5	5	1-3	<1	5-10	70	100	25-50	25-50	50-75
9	P-3	B	55-100	6.5	5	<1	<1	5	100	100	25-50	25-50	50-75
10	P-4	A	0-20	6.5	6.3	1-5	<1	10-25	70	100	5-10	25-50	25-50
11	P-4	AB	20-60	5.5	4.7	1-5	<1	10-25	20	50	10-25	10-25	25-50
12	P-4	B	60-100	5.5	5	1-5	<1	5-10	20	50	25-50	25-50	50-75
13	P-5	A	0-15	6.7	5.1	1-5	<1	5-10	20	100	1-10	25-50	10-25
14	P-5	AB	15-60	5.2	4	1-5	<1	10-25	10-20	100	10-25	10-25	10-25
15	P-5	B	60-100	5.5	4.8	1-5	<1	5-10	1-10	50-100	25-50	25-50	50-75
16	P-6	A	0-15	7.2	6.9	1-5	6	10-25	35	200	75-100	25-50	25-50
17	P-6	B	15-30	7	6.6	1-5	1-5	10	25	100-200	100-150	50-75	25-50
18	P-7	A	0-15	6.2	6.5	4	1	5-10	35-70	100-200	10-25	5-10	10-25
19	P-7	B	15-35	5.9	5.5	4	<1	10	10	50	10-25	5-10	5-10
20	P-7	B1	35-55	5.6	5.8	4	<1	5	5	50	25-50	10-25	5-10
21	P-7	B2	55-75	5.5	6.7	2	<1	5	5	50	25-50	5-10	<5
22	P-8	A	0-15	7.2	6.8	1-5	1-5	5-10	35	100	10-25	25-50	25-50
23	P-8	AB	15-50	6.7	5.8	1-5	<1	10-25	20	50-100	25-50	25-50	25-50
24	P-8	B	60-100	6.2	5.5	1-5	<1	5-10	10-20	50-100	50-75	25-50	50-75
25	P-9	A	0-20	6.7	5.5	1-5	<1	5-10	35	200	75-100	25-50	25-50
26	P-9	B1	20-60	6.6	5.4	1-5	<1	10-25	70	200	50-75	50-75	25-50
27	P-9	B2	60-100	6.5	5.5	1-5	<1	5-10	70	100	50-75	50-75	75-100
28	P-10	A	0-20	5.3	4.2	1-5	<1	10-25	35-70	100-200	50-75	25-50	25-50
29	P-10	B1	20-60	5.5	4.7	1-5	<1	10-25	10-20	100-200	50-75	25-50	25-50
30	P-10	B2	60-100	5.5	4.5	1-5	<1	5-10	10-20	100-200	50-75	50-75	75-100
31	P-11	A	0-20	6.7	5	1-5	<1	5-10	1-10	50-100	25-50	>5	25-50
32	P-11	AB	20-60	5.7	4.4	1-5	<1	5-10	1-10	50-100	10-25	5-10	25-50
33	P-11	B	60-100	6.2	4.5	1-5	<1	5-10	1-10	50-100	10-25	10-25	50-75
34	P-12	A	0-18	7	5.5	1-5	<1	5-10	35-70	50	10-25	5-10	10-25
35	P-12	AB	18-45	6.7	4.7	1-5	<1	10-25	35-70	50-100	10-25	5-10	25-50
36	P-12	B1	45-80	5.7	4.6	1-5	<1	10-25	10-20	50-100	10-25	10-25	5-10
37	P-13	A1	0-20	7	6.8	<1	<1	5-10	70-100	100-200	50-75	10-20	10-25
38	P-14	A	0-15	5.5	4.5	1-5	<1	5-10	10-20	50-100	25-50	5-10	10-25
39	P-14	AB	15-40	5.4	4.4	1-5	<1	5-10	1-10	50-100	25-50	5-10	25-50
40	P-14	B2	80-100	5.5	4.4	1-5	<1	5-10	10-20	50-100	25-50	5-10	5-10
41	P-15	A1	0-15	7.2	7	1-5	<1	25-50	70-100	50-100	10-25	10-20	10-25
42	P-16	A	0-15	5.4	4.2	1-5	<1	<5	1-10	50-100	25-50	5-10	10-25
43	P-16	AB	15-50	5.5	4.7	<1	<1	5-10	1-10	50-100	25-50	5-10	25-50
44	P-16	B1	50-80	5.2	6.2	<1	<1	5-10	1-10	50-100	25-50	10-25	10-25
45	P-16	B2	80-100	6.6	7	1-5	<1	5-10	10-20	50-100	25-50	5-10	5-10

Sample No.	Symbol of Site	Horizon	Depth cm	pH		Nitrogen		Available Phosphorus P205-mg/100g Soil	Exchangeable				Available Iron Fe-ppm
				100	KCl	NH4-N-mg/100g Soil	Nitrate NO3-N-mg/100g Soil		Potassium K20-mg/100g Soil	Calcium Ca0-mg/100g Soil	Magnesium Mg0-mg/100g Soil	Manganese Mn-ppm	
46	P-17	A	0-15	5.4	4.7	1.5	<1	5-10	10-20	50-100	1-10	10-20	10-25
47	P-18	Ap	0-15	5.3	5.2	1.5	<1	5-10	20-35	50-100	25-50	10-25	5-10
48	P-18	AB	15-40	7.2	7	1.5	<1	10-25	35-70	100-200	25-50	<5	5-10
49	P-18	Bgl	40-75	7	7.5	<1	<1	5-10	35-70	200-400	50-75	5-10	5-10
50	P-19	A	0-15	6.8	5.2	1.5	<1	5-10	20-35	50-100	1-10	5-10	5-10
51	P-19	AB	15-45	5.5	5.3	1.5	<1	10-25	20-35	50-100	10-25	5-10	10-25
52	P-19	B	45-100	5.6	5	1.5	<1	5-10	10-20	50-100	10-25	5-10	5-10
53	P-20	A	0-15	7.2	6.3	1.5	<1	10-25	20-35	50-100	25-50	5-10	10-25
54	P-20	B1	15-40	6.6	5.6	<1	<1	<5	20-35	50-100	25-50	10-25	10-25
55	P-20	B3	75-100	6.7	6.7	<1	<1	10-25	10-20	100-200	25-50	5-10	5-10
56	P-TH	Ap	0-16	5.6	5.5	<1	<1	5-10	35-70	50-100	25-50	5-10	25-50
57	P-TH	AB	16-40	5.3	5.4	<1	<1	5-10	20-35	50-100	50-75	5-10	25-50
58	P-TH	B1	40-67	5.9	5.5	1.5	1.5	5-10	10-20	50-100	50-75	5-10	25-50
59	P-TH	B2	67-120	6	5.5	<1	<1	10-25	10-20	100-200	25-50	5-10	75-100
60	P-LO	A	0-28	6.7	6.7	<1	<1	5-10	35-70	50-100	10-25	5-10	25-50
61	P-LO	B1	28-75	6.8	5.8	1.5	<1	5-10	35-70	100-200	25-50	5-10	50-75
62	P-LO	B2	75-120	6.5	6.2	1.5	<1	5-10	35-70	50-100	25-50	5-10	25-50
63	P-BC1	A	0-23	6.9	6.7	1.5	<1	5-10	20-35	50-100	25-50	5-10	10-25
64	P-BC1	B1	23-62	6.7	6.8	1.5	<1	10-25	10-20	50-100	25-50	5-10	50-75
65	P-BC1	B2	62-120	6.3	5.6	1.5	<1	5-10	1-10	50-100	50-75	10-25	50-75
66	P-FX	A	0-20	5.4	5.5	1.5	<1	5-10	1-10	50-100	25-50	5-10	10-25
67	P-FX	B1	20-50	6.2	6.4	1.5	<1	10-25	1-10	50-100	25-50	10-25	10-25
68	P-FX	BC	50-75	6.5	6.5	1.5	<1	5-10	1-10	100-200	25-50	1-10	10-25
69	P-FX	C	75+	6.5	6.7	<1	<1	5-10	1-10	50-100	25-50	5-10	5-10
56	P-BC2	A	0-28	5.6	4.2	1.5	<1	5-10	1-10	50-100	25-50	5-10	25-50
57	P-BC2	AB	28-50	5.5	5.7	1.5	<1	<5	1-10	50-100	25-50	5-10	25-50
58	P-BC2	B1	50-80	6.5	6.7	1.5	<1	<5	1-10	50-100	25-50	5-10	25-50
59	P-BC2	B2	80-100	6.3	5.6	<1	<1	5-10	1-10	50-100	25-50	5-10	25-50
58	P-TH	B1	40-67	5.9	5.5	1.5	1.5	5-10	10-20	50-100	50-75	5-10	25-50
59	P-TH	B2	67-120	6	5.5	<1	<1	10-25	10-20	100-200	25-50	5-10	75-100
60	P-LO	A	0-28	6.7	6.7	<1	<1	5-10	35-70	50-100	10-25	5-10	25-50
61	P-LO	B1	28-75	6.8	5.8	1.5	<1	5-10	35-70	100-200	25-50	5-10	50-75
62	P-LO	B2	75-120	6.5	6.2	1.5	<1	5-10	35-70	50-100	25-50	5-10	25-50
63	P-BC1	A	0-23	6.9	6.7	1.5	<1	5-10	20-35	50-100	25-50	5-10	10-25
64	P-BC1	B1	23-62	6.7	6.8	1.5	<1	10-25	10-20	50-100	25-50	5-10	50-75
65	P-BC1	B2	62-120	6.3	5.6	1.5	<1	5-10	1-10	50-100	50-75	10-25	50-75
66	P-FX	A	0-20	5.4	5.5	1.5	<1	5-10	1-10	50-100	25-50	5-10	10-25
67	P-FX	B1	20-50	6.2	6.4	1.5	<1	10-25	1-10	50-100	25-50	10-25	10-25
68	P-FX	BC	50-75	6.5	6.5	1.5	<1	5-10	1-10	100-200	25-50	1-10	10-25
69	P-FX	C	75+	6.5	6.7	<1	<1	5-10	1-10	50-100	25-50	5-10	5-10
56	P-BC2	A	0-28	5.6	4.2	1.5	<1	5-10	1-10	50-100	25-50	5-10	25-50
57	P-BC2	AB	28-50	5.5	5.7	1.5	<1	<5	1-10	50-100	25-50	5-10	25-50
58	P-BC2	B1	50-80	6.5	6.7	1.5	<1	<5	1-10	50-100	25-50	5-10	25-50
59	P-BC2	B2	80-100	6.3	5.6	<1	<1	5-10	1-10	50-100	25-50	5-10	25-50

Table I-5 Soil Units in the Study Area

Geological Origin	Soil Unit (Association)	Soil code	Area (ha: %)					Total
			Pakxong	Bachiang	Laongam	Salavan	Thateng	
Alluvial	Orthic Acrisols (Dystric Cambisol and Fuluvisol)	1	510	-	-	-	-	510
	Gleyic Acrisols (Eutric and Dystric Gleysol)	2	310 (0.05)	-	-	-	-	310
	Orthic Acrisols (Feric Acrisols)	3	-	-	-	-	-	-
Sand stone Clay stone	Orthic Acrisols (Dystric Cambisol)	4	2,250 (0.34)	2,010 (0.31)	-	840 (0.13)	-	5,100
	Lithic Acrisols (Lithosols)	5	148,570 (22.72)	510 (0.08)	1,000 (0.15)	5,210 (0.80)	4,610 (0.70)	159,900
Basalt	Dystric Nitosols	6	99,250 (15.17)	50,070 (7.55)	61,310 (9.37)	16,740 (2.55)	13,330 (2.04)	240,700
	Dystric Nitosols (Lithic Nitosols)	7	42,630 (6.52)	-	4,690 (0.72)	160 (0.02)	13,440 (2.05)	60,920
	Lithic Nitosols (Lithosols)	8	47,960 (7.33)	1,650 (0.25)	27,680 (4.23)	8,980 (1.37)	150 (0.03)	86,430
Steep land		9	59,580 (9.11)	12,660 (1.94)	3,380 (0.52)	16,290 (2.45)	8,270 (1.25)	100,180
Total			401,060 (61.32)	66,910 (10.23)	98,060 (14.99)	48,220 (7.37)	39,800 (6.09)	654,050 (100.0)

Table I-6 Land Capability Classification

Land Capability Classes*	II	III	IV	V	VI	VII	I/II	II/II	II/DI	III/II	IV/V	Total
	ha	ha	ha	ha	ha	ha	ha	ha	ha	ha	ha	ha
Pakxong	83,570	23,230	2,250	9,980	141,160	59,580	5,000	26,860	26,620	22,810	-	401,060
Bachiang	41,880	8,000	1,980	530	-	12,660	-	1,860	-	-	-	66,910
Laongam	59,810	2,880	-	990	-	3,530	-	36,850	-	-	-	98,060
Salavan	14,880	2,290	840	4,180	-	16,130	-	9,140	-	-	760	48,220
Thateng	5,020	6,000	-	1,910	2,900	8,270	-	14,920	570	210	-	39,800
Total ha	205,160	42,400	5,070	17,590	144,060	100,170	5,000	83,630	27,190	23,020	760	654,050
(%)	(31.37)	(6.48)	(0.78)	(2.69)	(22.03)	(15.32)	(0.76)	(12.79)	(4.16)	(3.52)	(0.12)	(100.0)

\*Classes may be outlined as follows: II and III are arable if moderate requirement is satisfied; IV has very severe limitatic for cropping use; V to VIII are not suitable for cropping. Numerator in fraction indicates the class under the condition paddy field.

Table I- 7 Land Suitability Classification

Suitable Class		Wet season rice	Dry season rice	Upland crops	Horticulture plants
		ha(%)	ha(%)	ha(%)	ha(%)
Pakxong	S1	860 ( 0.55)	1,480 ( 0.95)	1,370 ( 0.88)	25,130 ( 16.21)
	S2	860 ( 0.55)	1,490 ( 0.96)	1,380 ( 0.89)	25,320(16.33)
	S3	10 ( 0.01)	20 ( 0.01)	30 ( 0.02)	280 ( 0.18)
	N1	40 ( 0.03)	-	-	-
	N2	-	-	-	-
	Total	1,770 ( 1.14)	2,990 ( 1.93)	2,770 ( 1.79)	50,730 (32.71)
Bachiang	S1	-	-	-	-
	S2	160 ( 0.10)	1,350 ( 0.87)	480 ( 0.31)	200 ( 0.13)
	S3	540 ( 0.35)	4,670 ( 3.01)	-	210 ( 0.14)
	N1	1,950 ( 1.26)	16,880 (10.89)	-	2,480 ( 1.60)
	N2	170 ( 0.11)	1,500 ( 0.97)	-	220 ( 0.14)
	Total	2,820 ( 1.82)	24,400 (15.73)	480 ( 0.31)	3,110 ( 2.01)
Salavan	S1	-	-	-	-
	S2	90 ( 0.06)	20 ( 0.01)	230 ( 0.15)	20 ( 0.01)
	S3	200 ( 0.13)	20 ( 0.01)	540 ( 0.35)	50 ( 0.03)
	N1	2,300 ( 1.48)	240 ( 0.15)	6,190 ( 3.99)	610 ( 0.39)
	N2	130 ( 0.08)	20 ( 0.01)	340 ( 0.22)	30 ( 0.02)
	Total	2,720 ( 1.75)	300 ( 0.19)	7,300 ( 4.71)	710 ( 0.46)
Laongam	S1	180 ( 0.12)	100 ( 0.06)	700 ( 0.45)	160 ( 0.10)
	S2	2,290 ( 1.48)	1,250 ( 0.81)	8,770 ( 5.66)	1,950 ( 1.26)
	S3	2,510 ( 1.62)	1,400 ( 0.90)	9,640 ( 6.22)	2,140 ( 1.38)
	N1	2,910 ( 1.88)	1,620 ( 1.04)	11,150 ( 7.19)	2,480 ( 1.60)
	N2	160 ( 0.10)	100 ( 0.06)	600 ( 0.39)	130 ( 0.08)
	Total	8,050 ( 1.82)	4,470 ( 2.88)	30,860 (19.91)	6,860 ( 4.42)
Thateng	S1	-	-	-	-
	S2	360 ( 0.23)	650 ( 0.42)	650 ( 0.42)	2,720 ( 1.75)
	S3	10 ( 0.01)	10 ( 0.01)	10 ( 0.01)	40 ( 0.03)
	N1	20 ( 0.01)	40 ( 0.03)	40 ( 0.03)	180 ( 0.12)
	N2	-	-	-	-
	Total	390 ( 0.25)	700 ( 0.45)	700 ( 0.45)	2,940 ( 1.90)
Grand Total		15,750 (10.16)	32,860 (21.19)	42,110 (27.16)	64,350 (41.50)

Table I-8 Present Land Use in Total Study Area

Land use categories	Pakxong ha (%)	Bachiang ha (%)	Laongam ha (%)	Salavan ha (%)	Thateng ha (%)	Total ha (%)
Agricultural land	18,590 ( 2.84)	4,010 ( 0.61)	13,260 ( 2.03)	2,630 ( 0.40)	2,630 ( 0.40)	41,120 ( 6.29)
Coffee	16,100	560	6,700	50	970	24,380 ( 3.73)
Tea	380	-	-	-	-	380 ( 0.06)
Lowland rice	240	540	460	2,390	270	3,900 ( 0.60)
Upland rice	710	2,260	4,700	160	1,110	8,940 ( 1.37)
Cardamom	760	650	1,400	30	280	3,120 ( 0.48)
Vegetables	400	-	-	-	-	400 ( 0.06)
Grass land	29,100 ( 4.45)	8,370 ( 1.28)	3,590 ( 0.55)	910 ( 0.14)	960 ( 0.15)	42,960 ( 6.57)
Dense forest land	218,790 (33.45)	24,480 ( 3.74)	7,270 ( 1.11)	18,410 ( 2.81)	15,220 ( 2.33)	284,170 (43.45)
Clear forest land	123,580 (18.89)	27,370 ( 4.18)	82,240 (12.57)	25,810 ( 3.95)	22,220 ( 3.40)	281,220 (42.99)
Other area*	2,650 ( 0.41)	700 ( 0.11)	630 ( 0.10)	450 ( 0.07)	150 ( 0.02)	4,580 ( 0.70)
Total	392,710 (60.04)	64,930 ( 9.93)	106,990 (16.36)	48,240 ( 7.38)	41,180 ( 6.30)	654,050 (100.0)

Table I-9 Present Land Use in Tentatively Selected Priority Development Areas

Area No.	ha:							
	1	2	3	4	5	6	7	8
Area Name	Upper Champi	Upper Tapoung	Lower Xe Pian	Upper Makchan	Middle Xe Katan	Middle Namtang	Lower Makchan-gai	Lower Champi
Agricultural land	80	50	80	210	150	60	140	770
Grass land	140	20	-	280	340	50	160	500
Forest land	130	90	270	110	240	210	130	1,510
Others	1,100	40	790	220	70	30	20	120
Total	1,450	200	1,140	600	800	350	450	2,900
Area No.	9	10	11	12	13	14	15	16
Area Name	Upper Kapheu	Middle Tapoung	Lower Tapoung	Lower Xe Set	Lower Namsai	Upper Thon	Middle Laophan	Upper Tay-Un
Agricultural land	850	370	1,790	690	7,840	480	320	70
Grass land	20	640	1,440	1,710	950	330	1,170	580
Forest Land	530	-	1,990	400	-	90	1,550	210
Others	-	30	180	-	210	-	460	-
Total	1,400	1,000	5,400	2,800	9,000	900	3,500	860

Table I-10 Agricultural Potential Area in the Study Area

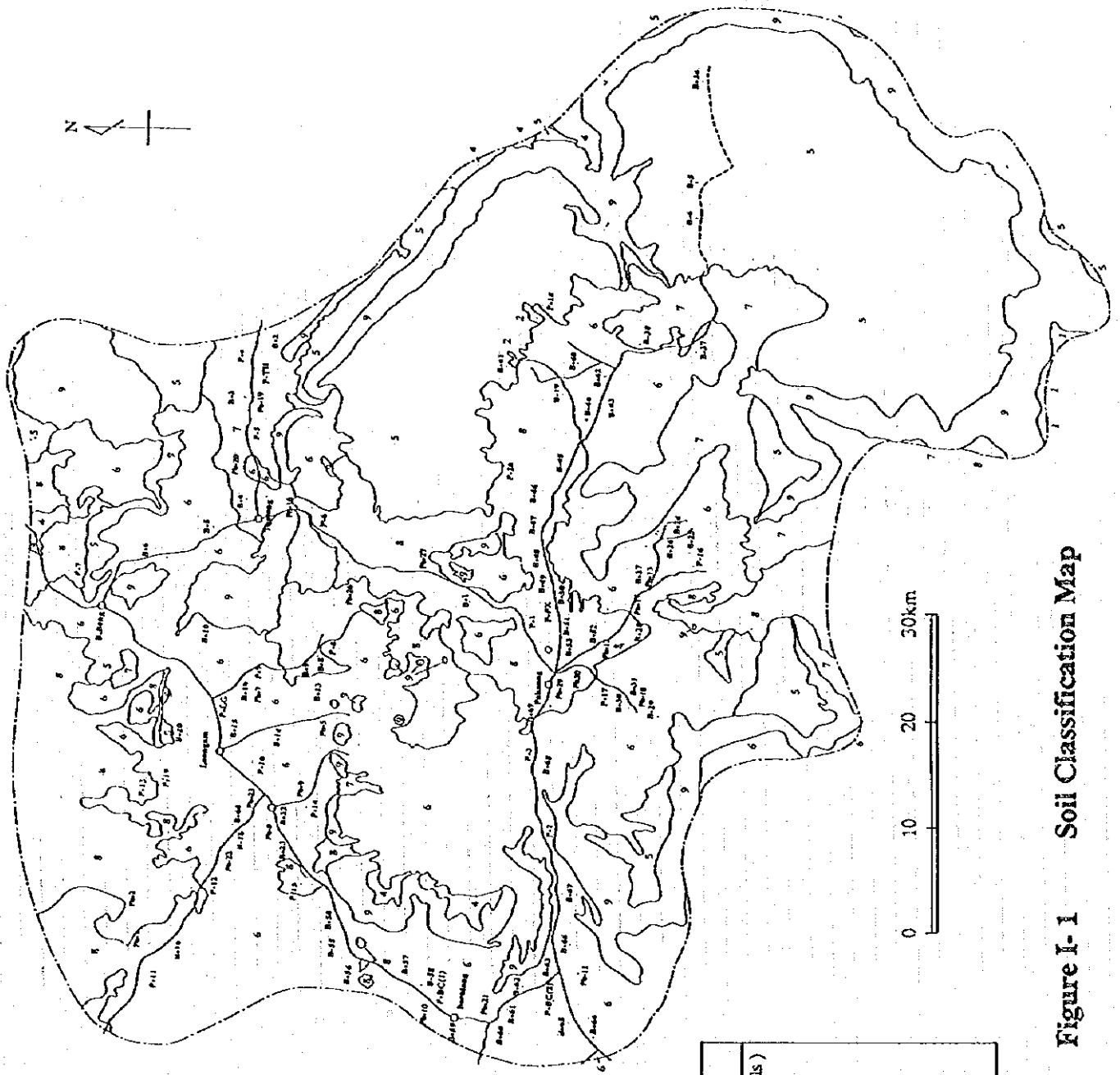
Unit: ha

Province	District	Zone	Whole Area	Potential Area	Altitude							Sub-Potential Area	Forest Area	Other Area	
					<200	200-400	400-600	600-800	800-1,000	1,000-1,200	>1,200				
Champasak	Fakxong	1	23,520	5,900	-	-	-	-	-	-	730	5,170	2,450	7,550	7,620
		2	22,580	5,930	-	40	200	1,060	2,810	1,620	200	5,380	11,060	210	
		3	13,450	1,280	-	-	-	-	-	1,260	20	1,740	9,780	660	
		4	13,870	6,650	-	-	-	20	4,900	1,730	-	5,660	1,390	170	
		5	27,200	1,550	-	-	-	-	340	570	1,040	2,440	15,950	6,860	
		6	62,020	14,120	-	-	-	110	4,570	6,170	3,270	4,230	19,740	23,930	
		7	36,100	10,150	-	-	-	-	3,120	4,410	2,620	13,200	5,700	7,050	
		8	59,660	12,280	-	-	10	120	720	11,400	30	4,160	41,280	1,940	
		9	142,650	-	-	-	-	-	-	-	-	-	141,130	1,520	
	Total	401,060	58,260	0	50	1,910	1,910	27,140	16,520	12,320	39,260	253,580	49,960		
	Bachlang	1	9,640	6,390	-	1,640	4,750	-	-	-	-	-	730	2,520	
		2	21,490	11,170	1,250	6,160	90	-	1,670	-	-	-	6,290	4,030	
		3	13,960	6,180	270	5,870	-	-	40	-	-	-	4,520	3,260	
		4	7,190	4,140	-	3,080	1,060	-	-	-	-	-	1,940	1,110	
		5	1,820	1,820	-	1,820	-	-	-	-	-	-	-	-	
		6	12,810	1,110	370	740	-	-	-	-	-	-	11,000	700	
	Total	66,910	30,810	1,890	21,310	5,900	0	1,710	0	0	0	24,480	11,620		
	Salavan	Salavan	1	680	-	-	-	-	-	-	-	-	-	280	400
			2	13,530	2,650	450	2,200	-	-	-	-	-	470	3,150	7,260
3			8,930	2,340	70	2,270	-	-	-	-	-	-	-	6,590	
4			11,490	6,040	-	4,870	820	350	-	-	-	-	1,710	3,740	
6			320	-	-	-	-	-	-	-	-	-	-	320	
9			680	-	-	-	-	-	-	-	-	-	-	680	
10			12,590	-	-	-	-	-	-	-	-	-	12,590	-	
Total			48,220	11,030	520	9,340	820	350	0	0	0	470	18,410	18,310	
Laongam			1	5,880	5,880	-	-	4,870	1,010	-	-	-	-	-	-
		2	3,690	3,690	-	-	2,670	1,020	-	-	-	-	-	-	
		3	8,360	5,920	-	-	-	3,280	1,970	670	-	1,920	-	520	
		4	8,610	4,960	-	-	1,430	1,670	1,390	470	-	1,360	1,780	510	
		5	20,940	11,810	890	10,720	200	-	-	-	-	-	-	9,130	
		6	17,180	6,480	80	3,650	2,750	-	-	-	-	-	-	10,700	
		7	15,380	3,590	-	2,800	790	-	-	-	-	-	460	11,330	
		8	3,530	2,380	-	990	1,390	-	-	-	-	-	210	940	
		9	3,300	2,170	-	-	1,590	580	-	-	-	-	590	140	
		10	11,190	3,360	-	-	-	2,830	530	-	-	-	3,830	4,000	
Total		98,060	50,240	970	18,160	15,620	10,390	3,890	1,140	0	3,280	7,270	37,270		
Sekong	Tbateng	1	5,450	-	-	-	-	-	-	-	-	1,160	4,140	150	
		2	14,270	3,780	-	-	-	3,150	630	-	-	2,630	4,010	3,850	
		3	13,660	950	-	290	60	600	-	-	-	7,320	2,720	2,670	
		4	6,420	-	-	-	-	-	-	-	-	1,420	4,350	650	
	Total	39,800	4,730	0	290	60	3,750	630	0	0	12,530	15,220	7,320		
Grand Total		654,050	155,070	3,380	49,150	22,790	16,400	33,370	17,660	12,320	55,540	318,960	124,480		

Notes: Forest Area = High Mountain, Forest Conservation Area and Steep Land  
 Potential Area = Except Present Rice Field on Other Projects

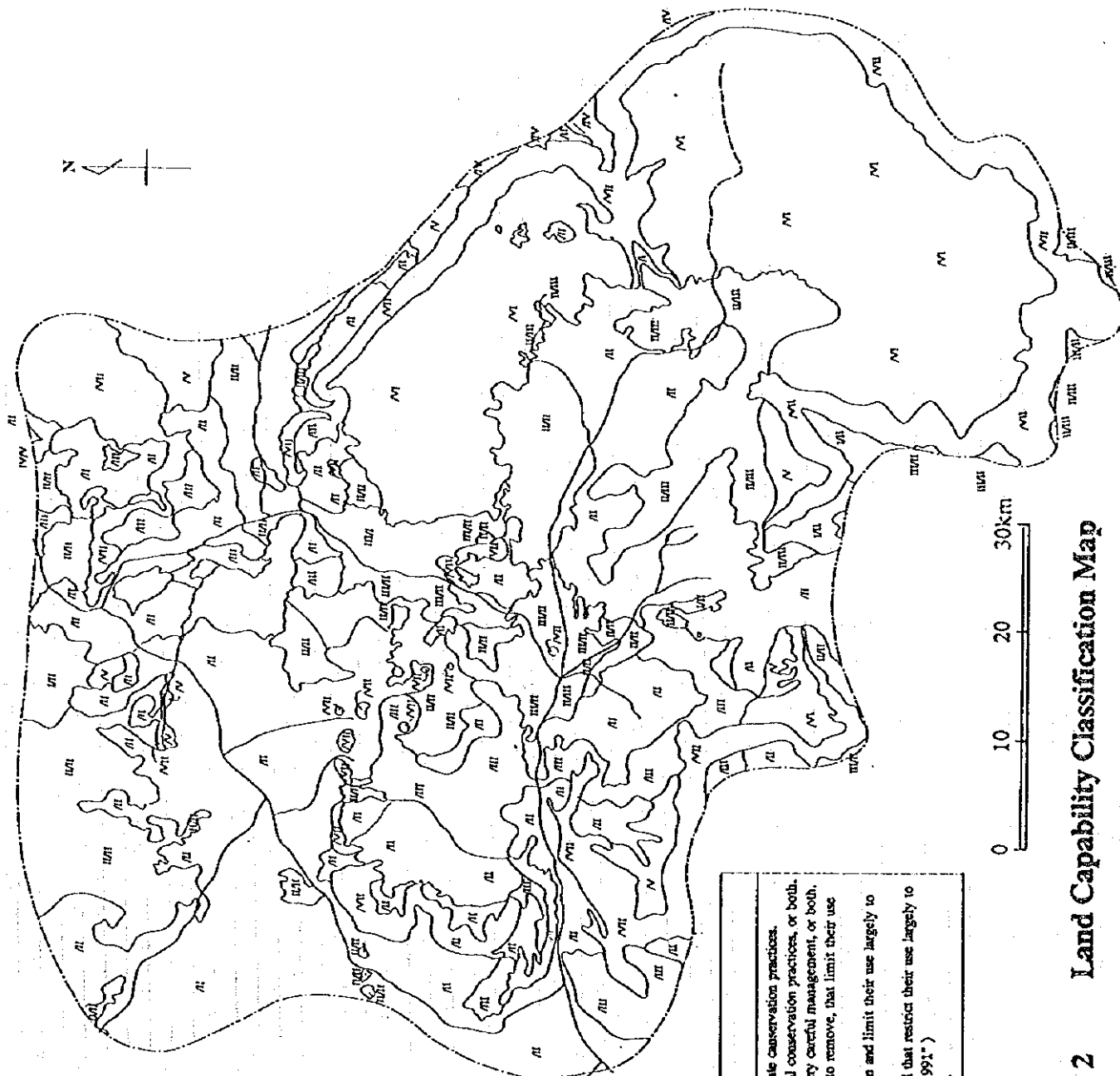
## *Figures*





LEGEND	
1 :	Orthic Acrisols ( Dystric Cambisols and Fluvisols )
2 :	Gleyic Acrisols ( Eumic and Dystric Gleysols )
4 :	Orthic Acrisols ( Dystric Cambisols )
5 :	Lithic Acrisols ( Lithosols )
6 :	Dystric Nitosols
7 :	Dystric Nitosols ( Lithic Nitosols )
8 :	Lithic Nitosols
9 :	Steep Land

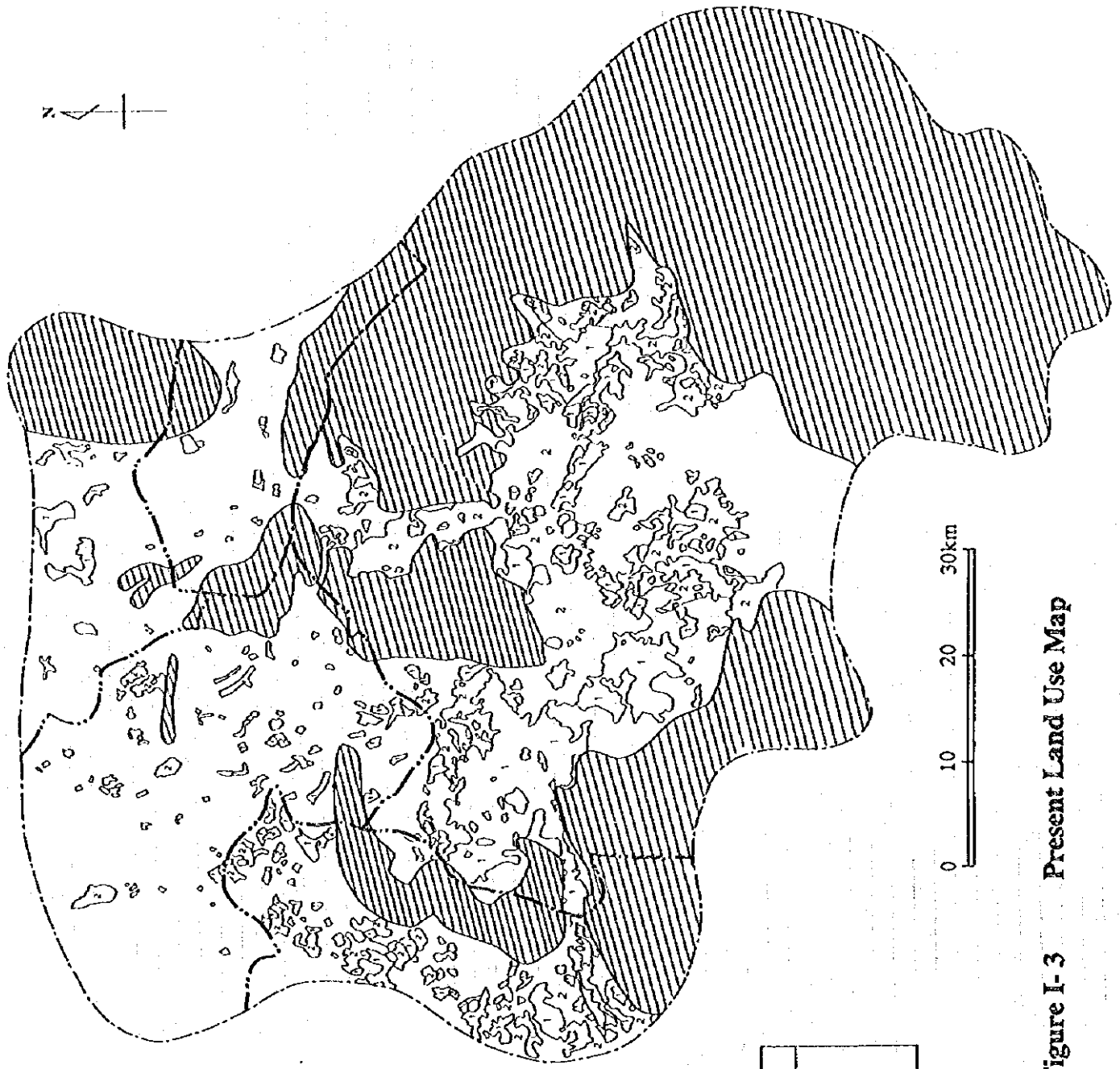
Figure I-1 Soil Classification Map




**LEGEND**

- II : Soils have some limitations that reduce the choice of plants or require moderate conservation practices.
- III : Soils have severe limitations that reduce the choice of plants or require special conservation practices, or both.
- IV : Soils have very severe limitations that restrict the choice of plants, require very careful management, or both.
- V : Soils have little or no erosion hazard but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife food and cover.
- VI : Soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife food and cover.
- VII : Soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to grazing, woodland or wildlife (quoted from "Booker Tropical Soil Manual : 1991")  
Class under the condition of peaty field / Class under the condition of upland.

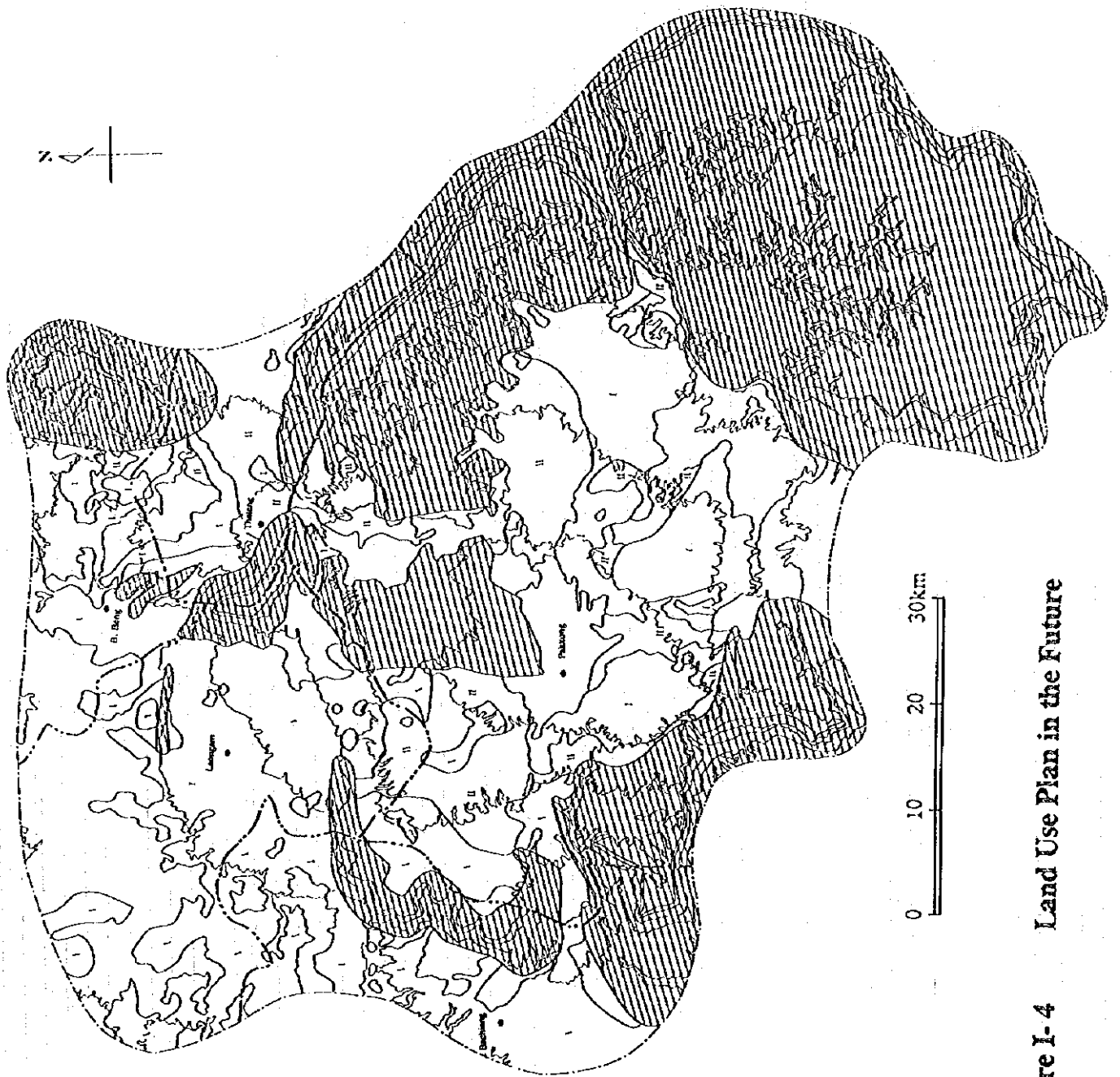
**Figure I-2 Land Capability Classification Map**



LEGEND	
1	Agricultural Land
2	Grass Land
	Forest Conservation Area

0 10 20 30km

Figure I-3 Present Land Use Map




LEGEND	
I	Potential Area
II	Sub-Potential Area
	Forest Area



Figure I-4 Land Use Plan in the Future

**ANNEX II SOILS AND LAND USE**  
**PART II THE FEASIBILITY STUDY**  
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## ANNEX II SOILS AND LAND USE

### PART II THE FEASIBILITY STUDY

#### I GENERAL

The present study (Phase III) on soils and land use aim at estimating in details soil units and their distribution in five selected priority Schemes (namely, Upper Champi, Upper Tapoung, Upper Kapheu, Lower Xe set and Upper Tay-Un) to evaluate the land resources and to estimate the feasibility of land development.

Soils and land use examination was made in five kinds of procedure, that is analysis of existing data, field survey, intake rate determination, soil chemical analysis and physical analysis. In addition to existing topographical maps and the results of the previous soil examination, two sets (one with a scale of 1 to 20 000 and another with a scale of 1 to 10 000) numbering fifty five sheets of aerial photographs, respectively, which were taken by the study team in this investigation (Phase II) for the above-mentioned Schemes and twenty six pieces of topographical charts (with a scale of 1 to 5 000) which were prepared from the aerial photographs were arranged. Soil classification of the five priority project Schemes was made by using the system FAO/UNESCO (1974), and land evaluation was done in conformity with the procedure for land capability classification legislated by USDA (1961), with taking the procedure for land suitability classification systems enacted by USBA, or by FAO in account.

#### II SOILS

##### 2.1 Methods of Soil Survey

On the basis of the data obtained by soil survey, properties and distribution of soils are revealed, the soils are classified into their several sorts, and the soil maps are prepared. At the same time, the land is evaluated by rating its capability, and the land capability and suitability map is produced. Moreover, the present land use aspect is observed on the way of soil survey and the results obtained are illustrated on the map and estimated in every kinds of use. In this way enforcement of soil survey is indispensable for carrying forward a project to cope with both agricultural development (e.g. increase in crop production) and environmental conservation (e.g. decrease in erosion risk) on selected priority schemes. Therefore, the techniques to be utilized for soil survey, land evaluation and land use examination must be ones which have been backed by authorized methodologies.

##### 2.1.1 Data Collection

Certain existing data relating to soils and present and proposed land use in collected from the Ministry prior to the previous investigation (Phase I) to execute efficiently the study. In the present study (Phase III), all of aerial photographs and topographical and land use maps that were prepared closely on five selected priority Schemes at the Phase II in the study were collected. Among the data to be collected, the maps are very important.

According to FAO's information, in the stage of feasibility study, the types of land resource survey belong to both of reconnaissance and semi-detailed ones and their content are summarized as follows:

(Table a) Types of land resource survey

	Reconnaissance survey	Semi-detailed survey
Aim and level	Prefeasibility Regional planning Project location	Feasibility Development Planning
Site intensity and survey method	Free survey of variable intensity usually <1% 100 ha	Flexible or rigid grid. Intensity 1 per 15 to 50 ha
Preferred scales: Aerial photos	1: 40 000 to 1: 20 000	1: 25 000 to 1: 10 000
: Final map	≤ 1: 50 000	1: 25 000 to 1: 10 000

Source: Extracted from Table 2.1 in "BOOKER TROPICAL MANUAL" ed. by J.R. Landon (1991).

Furthermore, the mapping units used before this in land resource survey are selected and summarized as follows:

(Table b) Mapping units used in land resource survey

	Reconnaissance survey	Semi-detailed survey
Final mapping unit	1. Physiographic units/land systems 2. Soil associations 3. Land capability units 4. Potential development areas	1. Geomorphic units 2. Soil Series/associations 3. Land suitability/management classes 4. Major constraints or parameters
Landscape component		
: Geomorphology	Relief units, major landforms	Detailed landforms and elements, slope units
: Soil	Associations	Series, complexes or associations, soil phases and selected parameters
: Vegetation	Soil/climate-related types, plant associations	Plant associations and distribution
: Land use	Land use systems, cultivation density	Land use and farming systems, specific parameters, cropping patterns

Source: Extracted from Table 2.2 in "BOOKER TROPICAL SOIL MANUAL" ed by J.R. Landon (1991).

In this study, general topographical charts (in a 1 to 5 000 in scale) and the reports on soils and land use which were published as the results of the previous study were used fully. Furthermore, aerial photographs of 1: 20 000 and of 10 000 in scales were utilized for checking the topography and the present land use.

### 2.1.2 Field Survey

Field survey for soils and land use in five priority project Schemes was carried out in collaboration with a counterpart provided by the Ministry. The field work including landscape examination including topography and vegetation survey, institution of soil mapping units by boring with soil auger, pit preparation and its profile observation, soil description, soil sampling, etc., for soil and land use survey was enforced in conformity to the same procedures as that used in the previous study.



In this investigation, the intake rate determination was additionally done to obtain the suggestion for adequate water supplying method in every two sites in each Scheme.

#### (1) Boring Spot Test with Soil Auger

Boring spot test was done in two steps with two different kinds of soil auger. In practice, the work was made as follows:

For instance, in Upper Champi Scheme, in the first step, thirty spots were cored by a slender shaped auger to know an outline of soil distribution, and in second step, nine spots were bored by a thick garret type of auger to examine and describe the properties of individual soil column.

The number of boring sites in the first step work is one, twelve, twelve, and ten in Upper Tapoung, Upper Kapheu, Lower Xe Set and Upper Tay-Un, respectively. The density of the boring site is one per 74 ha in average. The number of boring sites in the second step work is seven, ten, six and five in Upper Tapoung, Upper Kapheu, Lower Xe Set and Upper Tay-Un, respectively. The density of the boring site is one per 104 ha in average.

As a result of the work, texture, color, more or less of organic matter, contents of big fragments such as gravel or stone, effective depth, consistence, etc., of soils were realized. Furthermore, slope of land surface, presence of surface stones or rock outcrops, biological state, drainage condition, degree of humidity, depth of the ground water table, aspects of erosion and erodibility were observed.

#### (2) Preparation of Excavating Pit and Observation of Soil Profile in the Pit

The observation of soil profiles was executed in excavating pits. The number of the pit was one every Scheme. The sites of the pits were chosen in consideration of land topography by using the charts of 1: 5 000 in scale. Pits were dug with shovel and hoe. The pits were prepared fundamentally in a size of one hundred twenty centimeters depth in maximum, two hundred centimeters long, and one hundred twenty centimeters wide. However, at the place that rock bed lies in relatively shallow situation, digging couldn't but be ceased at very thin horizon.

The procedure of soil description was mostly done in accordance with the Guidelines for Soil Profile Description (FAO) and the Soil Survey Manual (USDA, 1951). On each profile, horizon sequence, effective depth, color, texture, structure, consistence, gravel and stone content, hardness, ground water level, root spread, drainage, etc. were observed and recorded. Furthermore, landscape, land slope and vegetation were recorded.

#### (3) Sample Collection

Thirty one bulky samples of the soils were taken from thirteen boring spots and fourteen ones from five profiles for chemical analysis in laboratory. Two core samples that the volume of one sample is approximately one hundred milliliter were taken from each of one boring spot and five excavating pits for the determinations of pF-moisture content and particle size distribution.

#### (4) Intake Rate Determination

Cylinder intake rate of soil was determined in two sites for each of the Schemes by using iron cylinder (with 39.5 cm in diameter and 60 cm in high) and hook gage. In practice, the iron cylinder was sunk thirteen cm into the ground, and water was poured twenty five cm into the cylinder, and change of water surface by infiltration was traced

in the period of two hundred and forty minutes. In the case that infiltration rate is relatively fast, water was added in the course of a test.

### **2.1.3 Laboratory Analysis of Soil Samples**

#### **(1) Physical Properties**

The core samples were sent to Soil Survey & Classification Center, Ministry Agriculture and Forestry, Lao PDR, Vientiane and employed for analysis of water content at pF 2.5 and pF 4.2 and of particle size distribution.

#### **(2) Chemical Properties**

The soil samples taken from some boring spots and excavating pits were analyzed on chemical properties by using a set of simplified soil testing apparatus at the office room in Pakse City. The items of chemical analysis are as follows: pH(H<sub>2</sub>O), and pH(KCl), ammonia nitrogen, nitrate nitrogen, available phosphorus, exchangeable potassium and exchangeable calcium. These constituents except for pH value were extracted from each soil sample with unified solution and estimated by color and turbidity.

## **2.2 Results of Field Survey and Laboratory Analysis**

### **2.2.1 Field Survey**

#### **(1) Soil Descriptions on Boring Sites and Pit Profiles**

The observational data obtained for the soils of boring sites and pit profiles in five selected priority Schemes are given in Tables II- 1 to II- 5.

#### **(2) Cylinder Intake Rate Determination**

The data concerning the determination of cylinder intake rate are in Figures II- 1 to II- 5.

### **2.2.2 Laboratory Analysis**

#### **(1) Physical Analysis**

The data obtained by physical analysis which was made in the laboratory of Soil Survey & Classification center, Ministry of Agriculture and Forestry, Lao PDR, Vientiane are shown in Table II- 6.

#### **(2) Chemical Analysis**

The obtained by chemical analysis which was done in the office room ,Pakse are given in Tables II- 7 to II-11.

## **2.3 Interpretation and Classification of Soils**

On the basis of the data obtained by field survey and laboratory analysis above-mentioned, the characteristics of the soils found in five selected prior Schemes were considered and classified.

### 2.3.1 Upper Champl Scheme

In this Scheme (about 870 ha in area and 600 to 1 000 m in altitude), topography is almost plane to slightly undulant. The surface and sub-surface soils assume brown, dark brown to dark reddish brown color. The effective depth is medium to deep (50 to 100 cm). The texture is generally medium (silty loam) in surface layer and medium to heavy (clay loam to clay) in sub layer. The content of large mineral fragments such as gravel and rock is very low (less than 5%). The moisture condition is dry to moderately dry.

The intake rate values lie in the 23.95 mm to 8.89 mm/hr. The content of available water for plant growth is medium to high (8 to 15%).

The reaction is nearly neutral (pH 6.7 to 6.5 in KCl) across the whole extent of the soil horizon. It is assumed that the soils are moderate in nutrient holding capacity, because, in general, sub soils are rich in clay materials. The fertility is on relatively high level.

In conclusion, the soil derived from basalt rock (Dystric Nitosols) is found in almost all the places. However, another sorts of basaltic soil (Dystric Nitosols (Lithic Nitosols) and Nitosols (Lithosols)) are found in very small area of 15 ha in total.

### 2.3.2 Upper Tapoung Scheme

In this Scheme, (about 100 ha in area and 1200 m in altitude), the topography is plane to gently sloping with exception of one site near the saddle in the foothills. The surface and sub-surface soils assume dark to dark-reddish brown color. The effective depth is shallow (less than 30 cm) in some sites and deep (more than 90 cm) in another some sites. The texture is medium (silty loam) in surface layer and medium to heavy (silty clay loam to clay loam) in sub layer. The content of large mineral fragments such as gravel and rock is very low (less than 5%). The moisture condition is dry to moderate.

The intake rate values are on the low level (2.93 mm to 2.18 mm/ha). The content of available water for plant growth is medium (about 15%).

The reaction is almost neutral to feebly acid (pH 6.7 to 6.2 in KCl) across the whole extent of the soil horizon. It is expected that soils are moderate in nutrient holding capacity, because that soil horizons are rich in exchangeable potassium (150 to 70 K<sub>2</sub>O mg/100 g soil) and clay content is rather high in bottom layers. The fertility is on the high level.

In conclusion, the soils occurring extensively in the Scheme are two units of representative ones which are derived from basalt rock, that is, Dystric Nitosols and Dystric Nitosols (Lithic Nitosols).

### 2.3.3 Upper Kapheu Scheme

In this Scheme (about 1 2400 ha in area and 600 to 760 m in altitude), the topography is plane or undulant on the whole. The surface and sub-surface soils assume very dark reddish to dark reddish brown color. The effective depth is deep in the same way and is more than 100 cm with sites. The texture is medium (silty clay loam) in surface layer and medium to heavy (silty clay loam to clay) in sub layer. The content of large mineral fragments such as gravel and rock is very low (less than 5%). The moisture condition is wet to moderately dry.

The intake rate values lie on the middle level (12.87 mm to 16.04 mm/hr) in comparison with the values that has been obtained at another Schemes. The content of available water for plant growth is medium (about 14%).

The reaction is neutral to weak acid (pH 7.0 to 5.7 in KCl) across the whole of the soil horizons. It is presumed that the soils are moderate to high in nutrient holding capacity, because that the soil horizons are rich in both exchangeable potassium (100 to 150 K<sub>2</sub>O mg/100 g soil) and clay material in the whole of the horizons. The fertility is on the high level.

In conclusion, the soils found in the Scheme is only a unit of one derived from basalt rock, Dystric Nitosols.

#### 2.3.4 Lower Xe Set Scheme

In this scheme ( about 1250 ha in area and 310 to 370 m in altitude), the topography is plane, undulant, rolling or gently sloping with places. The color of the surface and sub-surface soils also changes variously in the range from dark reddish brown to dull yellowish brown.

In the light of such soil condition, it is evident that three units of soils, that is, Alluvial soils (Orthic Acrisols (Dystric Cambisols and Fluvisols)), Soils derived from Sand stone and clay stone (Orthic Acrisols (Dystric Cambisols)) and Soils derived from basalt rock (Dystric Nitosols) distribute in the Scheme.

##### (1) Alluvial soils

Alluvial soils are scattered in low land fields and their outskirts that spread at the back slough of both rivers of Xe Set and Lanan. The area is about 170 ha in total, and the topography is almost plane. The effective depth is generally shallow (less than 30 cm), and the texture is medium (silty loam). The fertility is on the middle to high level.

##### (2) The soils derived from sand stone and clay stone

The soils derived from sand stone and clay stone also are found in low land rice fields and their outskirts at the back slough of two rivers above-mentioned. The area is about 240 ha in total, and the topography is almost plane. The effective depth is shallow to deep (23 to 75 cm), and the texture is in the middle level between coarse (sandy loam) and medium (silty loam). The reaction is weak acid and the fertility is on the middle level.

##### (3) The soils derived from basalt rock

The soils derived from basalt rock found in main areas of the Scheme. The area is about 840 ha in total, and the topography is undulant, rolling or gently sloping. The effective depth is shallow (less than 20 cm in general), and the texture is usually medium (silty clay loam). Numbers of the large mineral fragments such as gravel and rock are found in the soil horizon and/or on the surface of the land with sites.

The intake rate values are on the middle level (5.71 mm and 6.03 mm/hr), and the contents of available water for plant growth are low (about 5%).

The reaction is weak acid (pH 5.5 to 6.7 in KCl) across the whole extent of the soil horizon. It is assumed that the soils are relative high in nutrient holding capacity, because that the soil horizon is rich in both available phosphorus (10 to 100 mg P<sub>2</sub>O<sub>5</sub>/ 100 g soil) and exchangeable potassium (70 to 150 mg K<sub>2</sub>O/ 100 g soil). The fertility is on the high level.

### 2.3.5 Upper Tay-Un

In this Scheme ( about 420 ha in area and 550 to 590 m in altitude), the surface and sub-surface soils that assume reddish brown to dark reddish brown color are distributed. However, those soils are divided into two units in the light of the soil conditions, that is, low land and upland. One unit is Alluvial soils and another is the soils derived from basalt rock.

#### (1) Alluvial Soils

Alluvial soils(Orthic Acrisols (Dystric and Fluvisols)) are found in low land rice fields that spread mainly at central area and scatteringly at northwest and south west parts. The area is 50 ha in total and the topography is plane. The effective depth is deep (more than 100 cm) and the texture is medium (silty clay loam) to heavy (clay loam).

The intake rate value is middle (6.85 mm/hr) and available water content is medium (about 11%).

The reaction is almost neutral (pH 6.7) across the whole extent of the soil horizon. It is guessed that soils are moderate in nutrient holding capacity, because that soil horizons are rich in exchangeable potassium (150 K<sub>2</sub>O mg/ 100 g soil). The fertility is on high level.

#### (2) The soils derived from basalt rock

The soils derived from basalt rock (Dystric Nitosols) are found in bush and forest areas that spread with accounting for the Scheme. The area is 360 ha in total and the topography is gently undulant. The effective depth is shallow to medium(20 to 60 cm) and the texture is medium (silty loam) to Heavy (clay).

The intake rate value is middle ( 9.41 mm/hr). It is assumed that the fertility is on the high level.

The distribution area of soil units in the five Schemes is shown in Table II-12.

## III PRESENT LAND USE

### 3.1 Present Land Use Observation

Present land use in five selected priority Schemes were examined by using the same procedure in previous study (Phase I). In this study (Phase III), the topographical and land use charts (a scale of 1 to 5 000) which were prepared from aerial photographs taken by the study team in Phase II were utilized effectively for present land use survey. The results obtained are summarized as follows:

#### 3.1.1 Upper Champi Scheme

In Upper Champi Scheme, coffee and tea are cultivated in wide area which approximately 72% of the Scheme. Mixed land of bush and grass that is borders of this area in the northeast and is surrounded by tall trees is promising for agricultural development.

#### 3.1.2 Upper Tapoung Scheme

In Upper Tapoung Scheme, almost all the area is covered bush and grass, and trees are dotted.

### **3.1.3 Upper Kapheu Scheme**

In Upper Kapheu Scheme, coffee is cultivated in the area of about 45% of the Scheme. Upland rice also is cultivated in the area of about 15% , but bush accounts about 36% of the Scheme.

### **3.1.4 Lower Xe Set Scheme**

In Lower Xe Set Scheme, low land rice and upland rice are cultivated in the area of about 8% and of about 11%, respectively. Upland crops, cotton, nuts, chili, etc. are cultivated at approximately about 7% of the Scheme. Fruits such as banana also are planted in small area (about 2%),but almost area of the remaining land is covered by bush, grass and tree.

### **3.1.5 Upper Tay-Un**

In Upper Tay-Un Scheme, slash and burn is practiced in large extent and upland rice and upland crops are cultivated in the area of about 8%. In the Scheme, distribution of swamp and pond is distinctively found. Therefore low land rice is cultivated where water is available in the wet season, but the area is only less than 4%. The main area of the remaining land is covered by bush, tree and grass.

The result on present land use survey is shown in Table II-13.

The actual state of land use in each Scheme is still more shown in Figures II- 6 to II-10.

## **IV LAND SUITABILITY**

### **4.1 Method of Land Evaluation**

Land evaluation was done in conformity with the procedure for land capability classification systems enacted by USBA, or by FAO in account in the same way that was described in PART II of this ANNEX.

### **4.2 Land Suitability of Five Selected Priority Schemes**

Land suitability of five project Schemes was examined by the land use capability classes indicating suitable land use intensity of Paddy/Upland/Orchard. A brief description for capacity classes is as follows:

- |            |  |
|------------|--|
| Class I.   | Soils have few limitations that restrict their use.  |
| Class II.  | Soils have some limitations that reduce the choice of plants or require moderate conservation.                   |
| Class III. | Soils have severe limitations that reduce the choice of plants, require special conservation practices. or both. |
| Class IV.  | Soils have very limitations that restrict the choice of plants, require very careful management, or both.        |

### **4.3 The results of land suitability**

The results obtained on land suitability for the areas which are suitable to cultivation of five selected priority Scheme are as follows:

#### **4.3.1 Upper Champi Scheme**

In Upper Champi Scheme, the suitability was estimated from the view point of land use under /upland/orchard. The result is as follows:

As the land for upland use, Class I is 5.7%; Class II is 44.3%; Class III is 49.4%; and Class IV is less than 1%. As the land for orchard use, Class I is 5.7%; Class II is 63.8%; Class III is 28.2%; and Class IV is 2.3%.

#### **4.3.2 Upper Tapoung Scheme**

In Upper Tapoung Scheme, the suitability was estimated from the view point of land use under /upland/orchard. The result is as follows:

As the land for upland use, Class I is 20%; Class II is 50%; and Class III is 30%. As the land for orchard use, Class I is 30%; Class II is 65%; and Class III is 5%.

#### **4.3.3 Upper Kapheu Scheme**

In Upper Kapheu Scheme, the suitability was estimated from the view point of land use under Paddy/upland/orchard. The result is as follows:

As the land for lowland use, Class II is 71.8%; and Class III is 28.2%. As the land for upland use, Class I is 37.1%; Class II is 41.1%; and Class III is 21.8%. As the land for orchard use, Class I is 19.4%; Class II is 53.2%; Class III is 22.6%; and Class IV is 4%.

#### **4.3.4 Lower Xe Set Scheme**

In Lower Xe Set Scheme, the suitability was estimated from the view point of land use under Paddy/upland. The result is as follows:

As the land for lowland use, Class I is 16%; Class II is 47.6%; and Class III is 52%. As the land for upland use, Class II is 8.4%; and Class III is 91.6%.

#### **4.3.5 Upper Tay-Un Scheme**

In Upper Tay-Un Scheme, the suitability was estimated from the view point of land use under lowland/upland/orchard. The result is as follows:

As the land for lowland use, Class I is 25.6%; Class II is 22.0%; and Class III is 52.4%. As the land for upland use, Class I is 19.5%; Class II is 65.9% and Class III is 14.6%. As the land for orchard use, Class I is 12.2%; Class II is 57.3%; and Class III is 30.5%.

The actual state concerning the land suitability of each Scheme is given in Tables II-14 to II-19 and Figures II-11 to 15 by showing with the match-markings of soil units and land suitability classes.

It may be given as a conclusion that, according to the results obtained by soil condition survey, it is evident on that soil resources in five selected Schemes are irrigable and favorable to agricultural development with irrigation in all cases.

## **V Prospective Land Use**

With taking the results of soil survey, present land use and land evaluation into consideration, the following prospective land use plan may be stated for five selected priority Scheme.

### **5.1 Upper champi Scheme**

In this Scheme, the representative basaltic soils colored in reddish brown are distributed in almost areas. The effective depth of horizon is medium to deep and the fertility level is relatively high. In practice, considerably wide area is use as coffee garden in which much amounts of coffee are produced. Additionally, tea plantation is made in not a few area. In view of such a situation, it is desirable that irrigation will be enforced to accomplish an increase in production of a good quality of coffee and of tea. Furthermore, it is looked forward to use the parts of bush and grass land as the land under highland vegetable cultivation by operation of irrigation.

### **5.2 Upper Tapoung Scheme**

In this Scheme, basaltic soils assuming with reddish brown color are distributed. Their fertility is on the high level. However, supply in nature condition of water is not satisfactory. For this reason, the land use as farmland is not always sufficient. If the effective irrigation is put in practice, land utilization as upland farm and orchard will be realized.

### **5.3 Upper Kapheu Scheme**

In this Scheme, the basaltic soils colored in reddish brown are distributed. From the view point of land capability, it is clear that the soils are good quality in the whole areas. Consequently, if the execution of irrigation works is carried out, various sorts of crops involving coffee, garden vegetables, rice, fruits, etc. will become to be cultivated with a high yield.

### **5.4 Lower Xe Set Scheme**

In this Scheme, three kinds of soils, namely, alluvial soils, the soils derived from sand stone and clay stone and basaltic soils are found with different areas. In the areas of the two former, paddy field are distributed in almost parts.

The fertility is on the middle to high level, but soil horizon is generally shallow. Accordingly, it is considered that the land is suited for cultivation of rice and upland crops by enforcement of irrigation.

### **5.5 Upper Tay-Un**

In this Scheme, alluvial soils and basaltic soils are distributed at the rate of 1 to 7 in area. Additionally, swamp is found in not a few area. At present, alluvial soil areas are used as paddy field, though, in future, swamp areas also will became to be used for paddy field by enforcement of drainage work.

The fertility is on the high level. Therefore, this Scheme will be use for paddy field, Upland farm and orchard by execution of irrigation and drainage works.

Prospective land use is given in Table 20.



## *Tables*

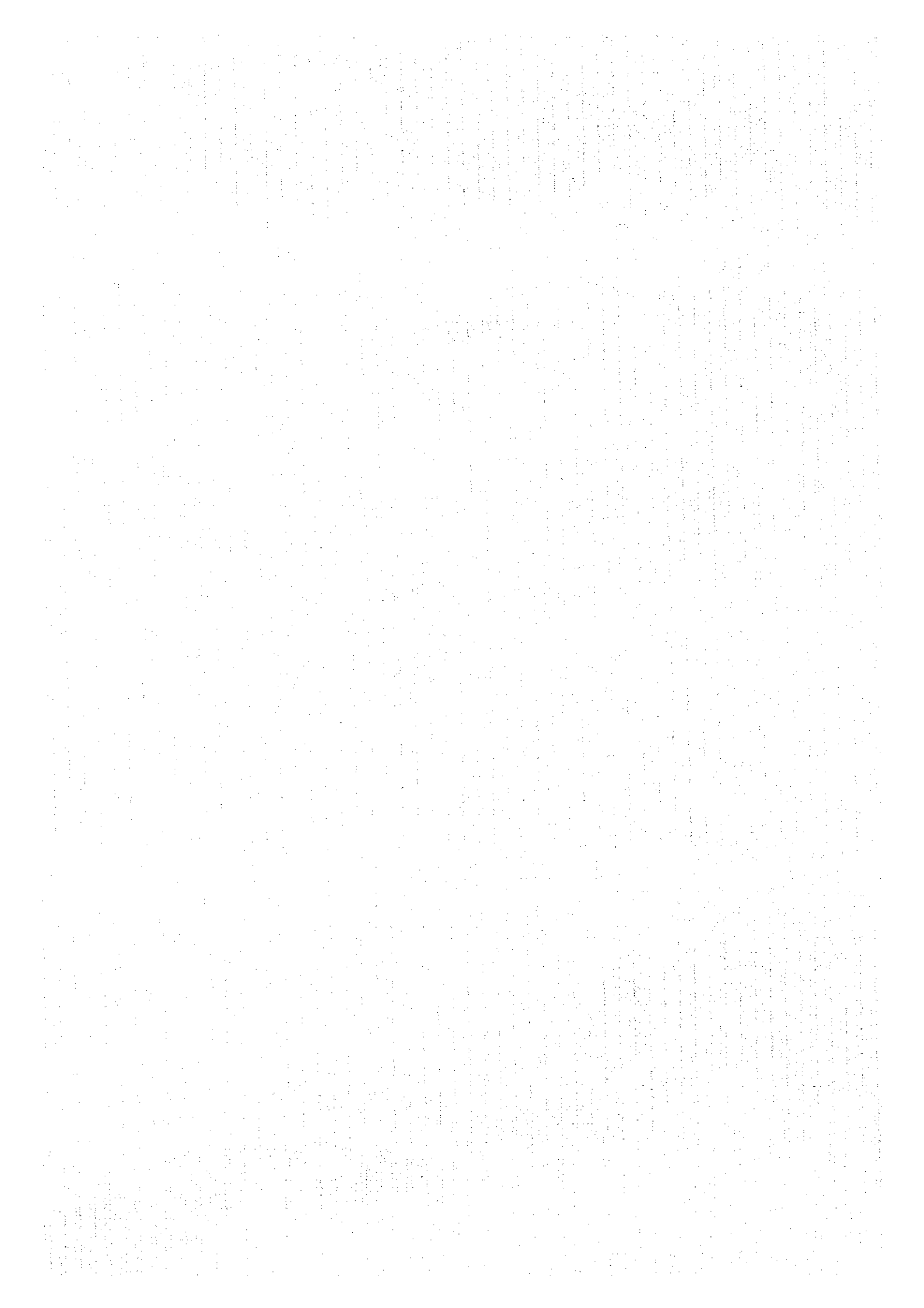


Table B-1: Soil Descriptions at Boring Spots and Pit Profiles in Selected Priority Schools - Upper Chicago

Symbol	General Information	Horizon	Depth	Color	Org. Matter	Texture	Structure	Consistency	Rock, etc.	Remarks***
B-1	Elevation	A	0-13	7.5YR4/4	Brown	15-25%	Silty loam	Sub angular	Medium	None
	Land use	B1	13-45	7.5YR3/3	Dark brown	<2%	Silty loam	Diao	Medium	None
	Slope	B2	45-70	7.5YR4/6	Diao	Few	Silty clay loam	Diao	Fine	None
	Topography									
	Parent material									
B-1	Elevation	A	0-25	5YR4/6	Reddish br.	2-5%	Silty loam	Sub angular	Medium	None
	Land use	B1	25-30	5YR3/6	Dark red br.	<2%	Silty loam	Diao	Medium	None
	Slope	B2	30-65	5YR3/4	Diao	Few	Silty clay loam	Diao	Fine	None
	Topography	B3	65-75	Diao	Diao	Few	Diao	Diao	Diao	None
	Parent material									
B-1	Elevation	A	0-15	2.5YR3/4	Dark red br.	2-5%	Silty loam	Sub angular	Medium	Few
	Land use	B1	15-42	2.5YR3/3	Diao	Few	Silty clay loam	Diao	Medium	None
	Slope	B2	42-85	2.5YR3/3	Diao	Few	Clay loam	Diao	Fine	None
	Topography	B3	85+	Diao	Diao	Few	Clay	Diao	Diao	None
	Parent material									
B-2	Elevation	A	0-15	5YR4/4	Dull red br.	<2%	Silty loam	Sub angular	Medium	None
	Land use	B1	15-40	5YR3/4	Diao	Few	Silty loam	Diao	Medium	None
	Slope	B2	40-50	5YR2/4	Very dark rb.	Few	Silty clay loam	Diao	Fine	None
	Topography	B3	50-78	5YR2/4	Diao	Few	Clay loam	Diao	Diao	None
	Parent material									
B-4	Elevation	A	0-15	2.5YR4/4	Dull red br.	<2%	Silty loam	Sub angular	Medium	None
	Land use	B1	15-57	2.5YR3/4	Dark brown	Few	Silty loam	Diao	Medium	None
	Slope	B2	57-88	5YR2/3	Dark red br.	Few	Silty clay loam	Diao	Fine	None
	Topography	B3	88+	5YR3/4	Diao	Few	Clay loam	Diao	Diao	None
	Parent material									
B-5(1)	Elevation	A	0-18	2.5YR4/4	Dull red br.	<2%	Silty loam	Sub angular	Medium	None
	Land use	B1	18-51	2.5YR3/3	Dark red br.	2-5%	Diao	Diao	Medium	None
	Slope	B2	51-72	2.5YR2/4	Very dark rb.	<2%	Silty clay loam	Diao	Diao	None
	Topography	B3	72-105	2.5YR3/6	Dark red br.	1-2%	Clay loam	Diao	Diao	None
	Parent material									
B-5(2)	Elevation	A	0-15	5YR3/3	Dark red br.	2-4%	Silty loam	Granular	Medium	None
	Land use	AB	15-60	5YR4/1	Dull red br.	Few	Diao	Diao	Medium	None
	Slope	B	60+	5YR4/6	Reddish br.	Few	Clay loam	Diao	Fine	None
	Topography									
	Parent material									
B-5(3)	Elevation	A	0-20	5YR3/3	Dark red br.	2-5%	Silty loam	Granular	Medium	None
	Land use	AB	20-25	5YR4/1	Dull red br.	Few	Diao	Diao	Medium	None
	Slope	B	25+	5YR4/6	Reddish br.	Few	Clay loam	Diao	Fine	None
	Topography									
	Parent material									
B-5(4)	Elevation	A	0-25	2.5YR3/4	Dark brown	2-3%	Silty clay loam	Granular	Medium	None
	Land use	B1	25-65	2.5YR4/6	Brown	Few	Clay loam	Diao	Fine	None
	Slope	B2	65-100	2.5YR4/4	Diao	Few	Clay	Diao	Fine	None
	Topography									
	Parent material									
B-5(5)	Elevation	A	0-20	2.5YR3/4	Dark brown	2-3%	Silty loam	Granular	Medium	None
	Land use	B1	20-60	10YR4/6	Dull yellow	Few	Silty clay loam	Diao	Fine	None
	Slope	B2	60-90	10YR4/6	Diao	Few	Silty clay loam	Diao	Fine	None
	Topography	B3	90+	Diao	Diao	Few	Clay	Sub angular	Fine	3-5% iron concret.
	Parent material									
B-5(6)	Elevation	A	0-20	2.5YR3/4	Dark brown	2-3%	Clay loam	Granular	Medium	None
	Land use	B1	20-60	2.5YR4/4	Diao	Few	Clay	Sub angular	Fine	None
	Slope	B2	60+	2.5YR4/6	Brown	Few	Clay	Diao	Fine	None
	Topography									
	Parent material									

\*B: Boring pit, B: Boring site.  
 \*\*Additional boring sites include area west of, Additional boring sites adjacent to road 3.  
 \*\*\*For pit include parent material.

Table D-2: Soil Descriptions on Boring Spots and Pit Profiles in Selected Priority Schemes - Upper Topsoil

Spot#	General Information	Horizon	Depth	Color	Org. Matter	Texture	Structure	Consist.	Rock, etc.	Remarks***
B-4	Elevation	A	0-9	7.5YR3/3	Dark brown	3-5%	Silty loam	Sub angular	Fine	None
	Lead use	B	9-25	7.5YR4/6	Brown	<1%	Silty clay loam	Disto	Disto	None
	Slope	Rock	25+							
	Topography									
	Parent material	Basalt								
	Soil group	Udic ultisols								
B-51	Elevation	A	0-10	10YR3/4	Dark brown	3-5%	Silty loam	Sub angular	Fine	None
	Lead use	B1	10-30	10YR4/4	Brown	1-3%	Silty loam	Disto	Disto	None
	Slope	B2	32-72	7.5YR4/3	Disto	<1%	Silty clay loam	Disto	Fine	None
	Topography	Rock	72+							
	Parent material	Basalt								
	Soil group	Udic ultisols								
B-52	Elevation	A	0-11	5YR3/3	Dark red br.	3-5%	Silty clay loam	Sub angular	Fine	None
	Lead use	B1	11-40	5YR3/6	Disto	<1%	Silty clay	Disto	Disto	None
	Slope	B2	40-98	5YR3/4	Disto	Few	Clay loam	Disto	Fine	None
	Topography									
	Parent material	Basalt								
	Soil group	Udic ultisols								
B-53	Elevation	A	0-8	5YR3/4	Dark red br.	3-5%	Silty loam	Sub angular	Fine	None, few 1-4cm pebbles
	Lead use	B1	8-29	5YR3/3	Disto	<1%	Silty loam	Disto	Disto	
	Slope	Rock	29+							
	Topography									
	Parent material	Basalt								
	Soil group	Udic ultisols								
B-54	Elevation	A	0-12	5YR3/6	Dark red br.	3-5%	Silty loam	Sub angular	Fine	None
	Lead use	B1	12-42	5YR3/4	Dark brown	<2%	Silty loam	Disto	Disto	None
	Slope	B2	42-88+	5YR4/4	Dull red br.	Few	Silty clay loam	Disto	Medium	None
	Topography									
	Parent material	Basalt								
	Soil group	Udic ultisols								
B-55	Elevation	A	0-11	2.5YR4/4	Dull red br.	4-5%	Silty loam	Sub angular	Fine	None
	Lead use	B1	11-51	2.5YR3/6	Dark red br.	Few	Disto	Disto	Disto	None
	Slope	B2	51-94+	2.5YR3/6	Disto	Few	Silty clay loam	Disto	Disto	None
	Topography									
	Parent material	Basalt								
	Soil group	Udic ultisols								
B-56	Elevation	A	0-15	5YR4/4	Dull red br.	4%	Silty loam	Sub angular	Medium	None
	Lead use	B1	15-30	5YR3/3	Dark red br.	Few	Silty clay loam	Disto	Disto	None
	Slope	B2	30-96+	5YR3/6	Disto	Few	Clay loam	Disto	Fine	None
	Topography									
	Parent material	Basalt								
	Soil group	Udic ultisols								
B-57	Elevation	A	0-10	7.5YR3/3	Dark brown	3-5%	Silty loam	Sub angular	Fine	None
	Lead use	B1	10-40	7.5YR4/6	Brown	<1%	Disto	Disto	Disto	None
	Slope	B2	40-80+	7.5YR3/2	Brown black	Few	Silty clay loam	Angular	Disto	None
	Topography									
	Parent material	Basalt								
	Soil group	Udic ultisols								

\* Excavating pit, B Boring site.

\*\* Additional boring sites inside area were 2. Additional boring sites without area were 2.

\*\*\* For pit enclosure to meet determination.

Table B-3 Soil Description for Boring Spots and Pit Profiles in Selected Priority Schemes - Upper Knapton

Symbol	General Information	Horizon	Depth	Color	Org. Matter	Texture	Structure	Coarse	Rock, etc.	Remarks**		
B-5	Elevation	A	0-13	2.5YR2/3	10%	Silty clay loam	Sub angular	Fine	None	Sample No 21 Sample No 25		
	Lead use	B1	13-47	2.5YR3/3	<10%	Dino	Dino	Fine	None			
	Slope	B2	47-100+	2.5YR3/4	Few	Dino	Angular	Fine	None			
	Topography	Undulating										
	Parent material	Basalt										
Soil group	Dystric Chernozem											
B-71	Elevation	A	0-12	2.5YR2/3	7%	Silty loam	Sub angular	Fine	None			
	Lead use	B1	12-54	2.5YR3/3	2%	Silty clay loam	Dino	Dino	None			
	Slope	B2	54-100+	2.5YR3/6	<1%	Silty clay loam	Dino	Prismatic	None			
	Topography	Plane										
	Parent material	Basalt										
Soil group	Dystric Chernozem											
B-72	Elevation	A	0-11	2.5YR2/4	5%	Silty clay loam	Sub angular	Fine	None			
	Lead use	B1	11-38	2.5YR3/3	<1%	Silty clay loam	Dino	Dino	None			
	Slope	B2	38-100+	2.5YR3/4	<2%	Clay loam	Angular	Dino	None			
	Topography	Very undulate										
	Parent material	Basalt										
Soil group	Dystric Chernozem											
B-73	Elevation	A	0-14	2.5YR2/2	10%	Silty clay loam	Sub angular	Fine	None			
	Lead use	B1	14-51	2.5YR2/3	<10%	Dino	Angular	Dino	None			
	Slope	B2	51-91+	2.5YR3/3	5%	Dino	Dino	Dino	None			
	Topography	Gentle slope										
	Parent material	Basalt										
Soil group	Dystric Chernozem											
B-74	Elevation	A	0-12	2.5YR2/2	10%	Silty clay loam	Sub angular	Fine	None			
	Lead use	B1	12-52	2.5YR2/3	<10%	Dino	Dino	Dino	None			
	Slope	B2	52-100+	2.5YR3/3	5%	Dino	Dino	Dino	None			
	Topography	Almost plane										
	Parent material	Basalt										
Soil group	Dystric Chernozem											
B-75	Elevation	A	0-12	2.5YR2/2	15%	Silty clay loam	Sub angular	Medium	None			
	Lead use	B1	12-41	2.5YR2/3	15%	Dino	Angular	Dino	None			
	Slope	B2	41-80+	2.5YR2/4	15%	Dino	Dino	Dino	None			
	Topography	Undulating										
	Parent material	Basalt										
Soil group	Dystric Chernozem											
B-76	Elevation	A	0-12	2.5YR2/2	10%	Silty clay loam	Sub angular	Fine	None			
	Lead use	B1	12-56	2.5YR3/2	<10%	Dino	Angular	Dino	None			
	Slope	B2	56-80+	2.5YR3/3	Few	Dino	Dino	Dino	None			
	Topography	Gentle slope										
	Parent material	Basalt										
Soil group	Dystric Chernozem											
B-77	Elevation	A	0-10	2.5YR2/1	15%	Silty clay loam	Sub angular	Medium	None			
	Lead use	B1	10-62	2.5YR3/2	<15%	Dino	Dino	Dino	None			
	Slope	B2	62-100+	2.5YR3/4	<5%	Dino	Dino	Dino	None			
	Topography	Plane										
	Parent material	Basalt										
Soil group	Dystric Chernozem											
B-78	Elevation	A	0-11	2.5YR2/2	<15%	Silty clay loam	Sub angular	Fine	None			
	Lead use	B1	11-64	2.5YR2/3	Dino	Dino	Angular	Fine	None			
	Slope	B2	64-80+	2.5YR2/4	<5%	Dino	Dino	Fine	None			
	Topography	Gentle slope										
	Parent material	Basalt										
Soil group	Dystric Chernozem											
B-79 (1)	Elevation	A	0-15	5YR3/4	23%	Silty clay loam	Granular	Medium	None			
	Lead use	AB	15-40	2.5YR3/4	Few	Silty clay	Dino	Fine	None			
	Slope	B1	40-80	2.5YR3/4	Few	Clay	Dino	Fine	None			
	Topography	Gentle slope										
	Parent material	Basalt										
Soil group	Dystric Chernozem											
B-79 (2)	Elevation	A	0-15	5YR3/5	23%	Clay loam	Granular	Medium	None			
	Lead use	AB	15-40	2.5YR3/4	Few	Clay loam	Dino	Fine	None			
	Slope	B1	40-80	2.5YR3/6	Few	Clay	Dino	Fine	None			
	Topography	Gentle slope										
	Parent material	Basalt										
Soil group	Dystric Chernozem											

\*B: Excavating pit, B: Boring site.  
 \*\*Additional boring data include area, water table.  
 \*\*\*For pit entries no correct determination.

Table II-4. Soil Descriptions at Working Sites and Pit Profiles in Selected Priority Schemes - Lower Xi Se.

Symbol	General description	Horizon	Depth	Color	Org. Matter	Texture	Structure	Coarsh.	Rock, etc.	Remarks**	
B-3	Elevation	300mMSL	A	0-5	5YR2/4	Dark red br.	3%	Clay loam	Angular	Fine	Sample No. 5 Sample No. 19
	Land use	Cross-tilt/beans	B1	5-25	5YR2/3	Very dark rh.	2-3%	Dino	Dino	Dino	
	Slope	0-5%	B2	20+							
	Topography	Ubbul'atun									
	Parent material	Basalt									
	Soil group	Dystric alshods									
B-39	Elevation	325mMSL	A	0-13	5YR2/3	Very dark rh.	3-5%	Clay loam	Sub angular	Fine	3-5mm nodules Without the Scheme
	Land use	Bush	Rock	13+							
	Slope	3-5%									
	Topography	Ubbul'atun									
	Parent material	Basalt									
	Soil group	Dystric alshods									
B-40	Elevation	300mMSL	A	0-12	7.5YR5/3	Dull brown	<2%	Steady loam	Angular	Fine	None None None
	Land use	Bush/beans	B1	12-35	7.5YR4/4	Brown	1-2%	Silty loam	Dino	Dino	
	Slope	0-2%	B2	35-75	7.5YR4/6	Dino	0-1%	Dino	Dino	Dino	
	Topography	Almost plane	Rock	75+							
	Parent material	Basalt									
	Soil group	Dystric cambic									
B-42	Elevation	300mMSL	A	0-13	10YR7/3	Dull yellow	<2%	Silty clay loam	Sub angular	Fine	None 0.2mm, few None
	Land use	Paddy rice	B1	13-18	10YR5/4	Dino	<1%	Dino	Dino	Dino	
	Slope	0-2%	B2	18-23	10YR6/3	Dino	Few	Clayey	Dino	Very fine	
	Topography	Plane									
	Parent material	Basalt									
	Soil group	Dystric cambic									
B-43	Elevation	300mMSL	A	0-15	5YR2/4	Very dark rh.	<1%	Steady loam	Sub angular	Fine	None Without the Scheme
	Land use	Forest	Rock	15+							
	Slope	2-5%									
	Topography	Slightly									
	Parent material	Basalt and stone									
	Soil group	Dystric alshods									
B-21	Elevation	300mMSL	A	0-10	5YR2/4	Very dark rh.	3%	Silty clay loam	Sub angular	Fine	Many
	Land use	Forest	Rock	10+							
	Slope	3-8%									
	Topography	Ubbul'atun									
	Parent material	Basalt									
	Soil group	Dystric alshods									
B-22	Elevation	310mMSL	Status to B-21 Soil								Without the Scheme
	Land use	Forest									
	Slope	2-16%									
	Topography	Ubbul'atun									
	Parent material	Basalt									
	Soil group	Dystric alshods									
B-23	Elevation	310mMSL	A	0-10	5YR3/4	Dark red br.	5%	Silty clay loam	Sub angular	Fine	None
	Land use	Bush	Rock	10+							
	Slope	13%									
	Topography	Moderately sloping									
	Parent material	Basalt									
	Soil group	Dystric alshods									
B-24	Elevation	310mMSL	A	0-18	5YR4/6	Reddish br.	3%	Silty clay loam	Sub angular	Fine	Many Without the Scheme
	Land use	Cross land	Rock	18+							
	Slope	3-5%									
	Topography	Ubbul'atun									
	Parent material	Basalt									
	Soil group	Dystric alshods									
B-25	Elevation	340mMSL	Status to B-24 Soil								
	Land use	Bush									
	Slope	3-8%									
	Topography	Rolling									
	Parent material	Basalt									
	Soil group	Dystric alshods									
B-26	Elevation	340mMSL	Status to B-24 Soil								
	Land use	Bush									
	Slope	2-8%									
	Topography	Rolling									
	Parent material	Basalt									
	Soil group	Dystric alshods									

\*E: Elevation pt. B: Pitting site.  
 \*\*Additional boring data for sites were 25.  
 \*\*\*For pit profiles, consult descriptions.