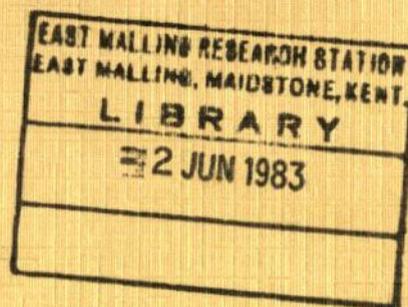


Dup

WOSSAC: 25448
631.4
(676.2)

Soils of the Kisii area, Kenya



Separate appendices

W.G. Wielemaker & H.W. Boxem (Eds)



MAP SHEET 130

Appendix 1 to Report No. 4 "Soils of the Kisii area"

RECONNAISSANCE SOIL MAP OF THE KISII AREA

Ministry of Agriculture - Kenya Soil Survey and
Agric. University, Dept. of Soil Science, Wageningen, The Netherlands

LEGEND



HILLS AND MINOR SCARPS (low relief intensity, slopes over 10%)

- HB** Soils developed on basalts
somewhat excessively drained, shallow to moderately deep, dark reddish brown, friable, gravelly clay, with 20-40cm acid humic topsoil (metric **CHALISOLS**, partly paralic phase)
- HX** Soils developed on various parent materials
excessively drained, very shallow, dark brown, very friable, rocky, sandy loam to clay loam, with 10-20cm acid humic topsoil (metric **LITHOSOLS** and **HANKERS**)

FOOTSLOPES (at the foot of hills, slopes from 8-15%)

- FB** Soils developed mainly on basalts
well drained, deep to very deep, dark red, friable clay, with more than 30cm humic topsoil (metric **PHAEZEZEMS** and metric **NITOSOLS**)
- FBN** like FB, but in steeper places shallow and rocky (quartzites) (metric and haplic **PHAEZEZEMS** and metric **NITOSOLS**)
- FY** Soils developed mainly on rhyolites and rhyolitic tuffs
well drained, deep to very deep, reddish brown, friable clay, with 20-40cm humic topsoil (metric **PHAEZEZEMS** and metric **NITOSOLS**)
- FP** Soils developed on pyroclastic materials (volcanic ash)
moderately well drained to imperfectly drained, deep, reddish brown, mottled, friable clay loam, more than 60cm thick over dark, mottled, compact clay (metric **LUVISOLS**)
- FQ** Soils developed on quartzites, with much volcanic ash
well drained, deep, reddish brown, friable clay, with about 25cm acid humic topsoil (metric **ACRISOLS**)

UPLANDS AND PLATEAU REMNANTS

- KENOKA UPLAND** (altitude 1800-2150m; rolling to hilly, with undulating plateau remnants)
U1P Soils developed mainly on pyroclastic materials (volcanic ash, rolling to hilly)
U1PN well drained, deep to very deep, dark reddish brown, friable, silty clay loam, with more than 30cm humic topsoil (metric **PHAEZEZEMS** and metric **NITOSOLS**)
- U1X** Soils developed mainly on andesites and rhyolites, with volcanic ash admixture (rolling to hilly)
U1XNP somewhat excessively drained, mainly shallow, dark reddish brown, friable, gravelly clay, with 15-30cm humic topsoil (metric **PHAEZEZEMS** and metric **NITOSOLS**)
- U1XN** well drained, deep to very deep, reddish brown, friable clay, with more than 30cm humic topsoil (metric **PHAEZEZEMS** and metric **NITOSOLS**)
- U1B** Soils developed on basalts (undulating plateau remnants)
U1BN well drained, deep to very deep, dark red, friable clay, with more than 30cm humic topsoil (metric **PHAEZEZEMS** and metric **NITOSOLS**)
- U1I** Soils developed on andesites and felsites (undulating plateau remnants)
U1IN well drained, very deep, dark red to reddish brown, friable clay, with more than 30cm humic topsoil (metric **PHAEZEZEMS** and metric **NITOSOLS**)
- U1Q** Soils developed on quartzites (undulating plateau remnants)
U1QN well drained, deep to very deep, reddish brown, friable clay, with 20-40cm very acid humic topsoil (metric **FERRALSOLS**)

MAGOMBO UPLAND (altitude 1700-1950m; undulating to rolling)

- U2I** Soils developed mainly on andesites, with volcanic ash admixture
U2IN well drained, very deep, reddish brown, friable clay, with more than 30cm humic topsoil (metric **PHAEZEZEMS** and metric **NITOSOLS**)

KISII UPLAND (altitude 1450-1800m; rolling)

- U3B** Soils developed on basalts
U3BN well drained, very deep, dark red, friable clay, with more than 30cm humic topsoil (metric **NITOSOLS**)
- U3N** well drained, deep to very deep, dark red, friable clay, with more than 30cm humic topsoil (metric **PHAEZEZEMS** and metric **NITOSOLS**)
- U3I** Soils developed mainly on quartz-diorites
U3IN well drained, very deep, reddish brown to red, friable clay, with more than 30cm humic or acid humic topsoil (metric **PHAEZEZEMS** and metric **NITOSOLS**)
- U3G** Soils developed on granites

PLAINS (slopes less than 5%, in places dissected)

- PB** Soils developed on alkali basalts and volcanic ash
PBN poorly drained, deep, dark grey to grey, firm clay, with a fine-structured, humic topsoil (metric **VERTISOLS**)
- PX** Soils developed on various parent materials, with volcanic ash admixture
PXN moderately well drained to imperfectly drained, mainly shallow, dark brown to dark greyish brown, friable, gravelly clay, predominantly over petroplinthite (murrum); with 20-40cm humic topsoil (metric **PHAEZEZEMS**, petroplinthic phase)
- PXA** poorly drained, deep, dark grey, mottled, firm clay, abruptly underlying 20-40cm of silt loam (metric **PLANOSOLS**)
- PXAN** association of soils of unit PXN and unit PXA (metric **PLANOSOLS**)
- PP** Soils developed on pyroclastic materials (volcanic ash)
PPN poorly drained, deep, black, very firm clay, abruptly underlying 20-40cm of loamy, humic topsoil; calcareous in the deeper subsoil; in places very poorly drained (metric **PLANOSOLS**)
- PG** Soils developed on granites, with volcanic ash admixture
PGN poorly drained, deep, dark grey, mottled, firm clay, abruptly underlying 30-60cm of loamy sand to sandy loam (metric **PHAEZEZEMS**, petroplinthic phase)

BOTTOMLANDS (slopes less than 5%)

- BB** Soils developed on alluvial materials mainly derived from alkali basalts, with volcanic ash admixture
BBN moderately well drained, very dark grey, firm, cracking clay (metric **PHAEZEZEMS**)
- BBV** poorly drained, deep, black to dark grey, mottled, firm, cracking clay (metric **VERTISOLS**)
- BX** Soils developed on various parent materials, with volcanic ash admixture
BXN imperfectly drained to poorly drained, deep, dark grey, slightly alkali, firm clay, abruptly underlying 20-50cm of silt loam (metric **PLANOSOLS**)
- BXV** poorly drained, deep, grey to light olive brown, mottled, firm, clay, abruptly underlying 30-70 cm of silt loam, with many iron-manganese concretions at transition (metric **PLANOSOLS**)
- BA** poorly drained, deep, dark greyish brown, moderately to strongly alkali, firm clay (metric **SOLONCHETS**)
- BAV** very poorly drained, deep, acid, peat to peaty clay over black to dark olive clay (metric **HISTOSOLS**)
- BG** Soils developed on alluvial materials, mainly derived from granite, with volcanic ash admixture
BGN imperfectly drained, deep, dark grey to grey, very firm, clay, abruptly underlying 10-20cm of loamy sand to sandy loam (metric **PLANOSOLS**)

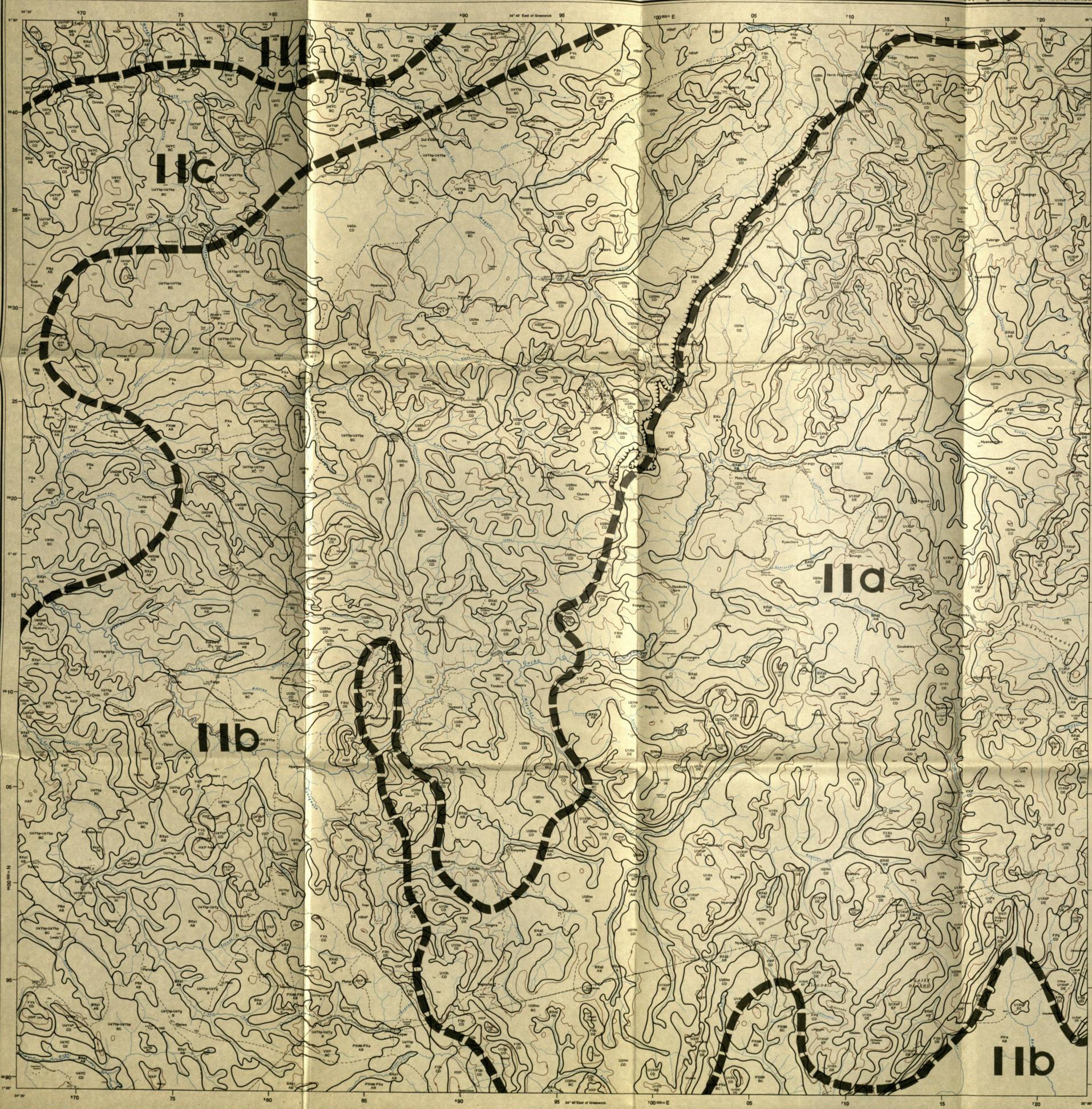
MINOR VALLEYS (slopes from 5-10%)

- VX** Soils developed on various parent materials
VXN excessively drained, shallow, dark reddish brown, very friable, gravelly clay, with 15-30cm humic topsoil; with inclusions of bottomlands (metric **PHAEZEZEMS**, lithic phase and **LITHOSOLS**)

The descriptions denote the characteristics of the subsoil (usually the B-horizon) where the topsoil differs from this subsoil by two or more textural classes. It is also described.

The names between brackets reflect the soil classification according to the 1974 FAO/UNESCO legend for their "Soil Map of the World". Prefixes marked with * are tentative terms awaiting international agreement on nomenclature.

KEY TO SLOPE CLASSES		
slope %	slope class symbol*	name of macrorelief
0-2	A	flat to very gently undulating
2-5	B	gently undulating



- HILLS AND MINOR SCARPS** (low relief intensity, slopes over 10%)
- HB Soils developed on basalts
 - HXA Soils developed on various parent materials
- FOOTSLOPES** (at the foot of hills, slopes from 8-10%)
- FB Soils developed mainly on basalts
 - FMA Soils developed mainly on andesites and rhyolites
 - FMB Soils developed mainly on rhyolites and rhyolitic tuffs
 - FP Soils developed on pyroclastic materials
 - FO Soils developed on quartzites, with much volcanic ash
- UPLANDS AND PLATEAU REMNANTS**
- KEROKA UPLAND** (altitude 1800-2150m; rolling to hilly, with undulating plateau remnants)
- UIP Soils developed mainly on pyroclastic materials
 - UIX Soils developed mainly on andesites and rhyolites
 - UIB Soils developed on basalts
 - UII Soils developed on andesites and felsites
 - UIQ Soils developed on quartzites
- MAGOMBO UPLAND** (altitude 1700-1950m; undulating to rolling)
- U2I Soils developed mainly on andesites
- KISII UPLAND** (altitude 1450-1800m; rolling)
- U3B Soils developed on basalts
 - U3M Soils developed mainly on quartz-diorites
 - U3G Soils developed on granites
- RONGO UPLAND** (altitude 1200-1500m; undulating to rolling, partly strongly dissected)
- U4B Soils developed on alkali basalts
 - U4Y Soils developed mainly on rhyolites
 - U4G Soils developed on granites

- PLAINS** (slopes less than 5%, in places dissected)
- PB Soils developed on alkali basalts and volcanic ash
 - PX Soils developed on various parent materials
 - PP Soils developed on pyroclastic materials
 - PG Soils developed on granites
- BOTTOMLANDS** (slopes less than 5%)
- BB Soils developed on alluvial materials
 - BX Soils developed on various parent materials
 - BG Soils developed on alluvial materials
- MINOR VALLEYS** (slopes from 5-16%)
- VX Soils developed on various parent materials

*The descriptions denote the characteristics of the subsoil (usually the B-horizon), where the topsoil differs from this subsoil by two or more textural classes, it is also described.

The names between brackets reflect the soil classification according to the 1974 FAO/UNESCO legend for their "Soil Map of the World". Prefixes marked with * are tentative terms awaiting international agreement on nomenclature.

KEY TO SLOPE CLASSES

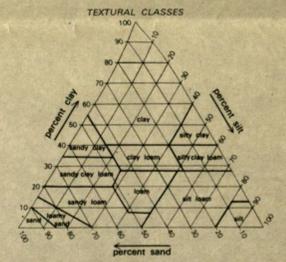
slope %	slope class symbol*	name of macrorelief
0-2	A	flat to very gently undulating
2-5	B	gently undulating
5-8	C	undulating
8-16	D	rolling
16-30	E	hilly
more than 30	F	steep

* not indicated for hills and minor scarps

KEY TO DEPTH CLASSES

thickness soil in cm	over rock symbol*	over petro-silthite symbol*	name
0-50	P	M	shallow
50-80	p	m	moderately deep
80-120			deep
more than 120			very deep

* if a complex of depth classes occurs within one unit, only the symbol of the shallowest depth class is indicated



ECOLOGICAL ZONES

ZONE	altitude (m)	rainfall (mm)	average temperature (°C)	average evaporation (mm)	average humidity (%)	average wind speed (km/h)	average relative humidity (%)	average number of days with rain	average number of days with frost	average number of days with snow	average number of days with hail	average number of days with fog	average number of days with drizzle	average number of days with rain or drizzle	average number of days with rain or drizzle or fog	average number of days with rain or drizzle or fog or hail	average number of days with rain or drizzle or fog or hail or snow	average number of days with rain or drizzle or fog or hail or snow or frost	average number of days with rain or drizzle or fog or hail or snow or frost or wind	average number of days with rain or drizzle or fog or hail or snow or frost or wind or sun	average number of days with rain or drizzle or fog or hail or snow or frost or wind or sun or moon	average number of days with rain or drizzle or fog or hail or snow or frost or wind or sun or moon or stars
Ia	1800-2100	78-127	1400-2100	1650-1800	600-880	420-720	100-1000	1.5 m	0	0	0	0	0	1.5 m	0	0	0	0	1.5 m	0	0	0
Ib	1400-1800	72-111	1400-2000	1800-1950	800-880	420-580	1000-1000	2 m	0	0	0	0	2 m	0	0	0	0	2 m	0	0	0	
Ic	1200-1400	64-72	1270-1400	1950-2000	800-850	400-450	1000-1000	1.5 m	0	0	0	0	1.5 m	0	0	0	0	1.5 m	0	0	0	
II	1150-1300	55-64	1120-1270	2000-2050	550-650	300-400	1000-1000	1 m	0	0	0	0	1 m	0	0	0	0	1 m	0	0	0	

KEY

- soil mapping symbol
- depth class symbol
- slope class symbol
- soil boundary
- slope class boundary
- ecological zone boundary
- 1:50,000
- 100 ha
- all weather road
- track
- priv. boundary
- district boundary
- school
- bridge
- dam
- river
- steep slope
- contours V.I. 500ft.

KEY TO SLOPE CLASSES

KEY TO DEPTH CLASSES

TEXTURAL CLASSES

ECOLOGICAL ZONES

KEY TO ADJOINING SHEETS

115	116	117
129	130	131
143	144	145

SURVEY AND MAP PREPARATION 1973-1977

soil survey: P.N. Bawa, R.P. Bremer, I. Gullikson, G.R. Henson, J.H. Kuylenstierna, van Kesteren, van Marrewijk, A.G. Oosterom, van Ravel, J.H.M. Scholten, H.E. Verweij, H.L. M. van Wieren

soil correlation: W.G. Warmer

map compilation: H.W. Bawa, W.G. Warmer

map correlation: S.J.A. van der Pijp

carto-lithography: O.D. Janssen

Soil classification according to FAO/UNESCO (1974)		Mapping unit	A horizon	A/B horizon		B horizon		Clay fraction										Soil classification according to "Soil Taxonomy" (Soil Survey Staff, 1975)											
main unit	subunit ¹		moist colour, descriptive	organic C % ²	clay % ³	base saturation at pH 7.0 % ⁴	transition A/B horizons	Clay ratio B/A horizons	clay %	silt/clay ratio	structure	moist consistence	cutans	base saturation at pH 7.0 %	CEC of clay at pH 7.0 %	kaolinite	halloysite	illite	montmorillonite	SiO ₂ /Al ₂ O ₃	SiO ₂ /Al ₂ O ₃ +Fe ₂ O ₃	Fe ₂ O ₃ % (mmol)	bulk density Mg/m ³	free carbonates (reaction of HCl)	Weatherable primary minerals laboratory W,P(O) ⁵ topsoil	primary W,P(O) ⁵ subsoil	Soil classification according to "Soil Taxonomy" (Soil Survey Staff, 1975)		
Ferralsols	humic	U1Qh	2 5YR 3/3, dark reddish brown	2.8	65	1	g	1	68	0.3	sb	fr	C1	0	12.6	+++	0	0	0	2.2	1.6	99	2.5YR 3/6-5YR 4/6 reddish brown to dark reddish brown	1.18	0	0	0	typic Haplohumox	
Nitrosols	mollic*(dystro-mollic*)	U3Bhn	2 5YR 3/2-3, dark reddish brown	3.5	65	80	c-g	1.3	80	0.3	ab	fr	C3	75(25)	16	.	.	.	.	2.1	1.6	96	2.5YR 3/6-2.5YR 3/4, dark red to dark reddish brown	1.25	0	1,13(94)	2,2(49)	typic Paleudoll and (orthoxic Palehumult)
	dystro-mollic*(mollic*)	U11hn	1 7.5-5YR 3/2, dark brown to dark reddish brown	3.5	63	100	g	1.3	83	0.2	ab-sb	fr	C3	33	11	+++	0	0	0	2.1	1.5	102	2.5YR 3/4, dark reddish brown	1.16	0	.	.	orthoxic Palehumult (typic Paleudoll)	
		U21hn	3 5YR 3/2, dark reddish brown	3.0	60	65	g	1.2	68	0.5	ab	fr	C2	30	18	+++	0	tr	0	2.3	1.7	100	5YR 3.5/4, yellowish red to dark reddish brown	1.11	0	13,31(78)	18,25(52)	orthoxic Palehumult	
	mollic* and humic	U31hn	5 5YR 3/3, dark reddish brown	2.3	50	70	c-g	1.2	63	0.2	ab-sb	fr	C2	75	14-6.5	+++	0	0	0	2.4	1.9	71-87	2.5YR 4/5, reddish brown to red	1.17	0	1,3(41)	2,15(24)	typic Paleudoll and orthoxic Palehumult	
	humic	U3Ghn	1 5YR 3/3, dark reddish brown	2	35	14	g	1.2	43	0.3	sb	fr	.	33	10	+++	0	0	0	1.3	1.1	80	5YR 4/6, yellowish red	1.5	0	1,0(5)	tr, tr (2)	orthoxic Palehumult	
Phaeozems and Nitrosols	luvic and mollic*	FBh	1 5YR 3/2, dark reddish brown	1.7	57	54	c	1.3	75	0.2	ab	fr	m2	50	21	.	.	.	.	.	.	.	2.5YR 3/6, dark red	1.25	0	.	.	oxic Argiudoll and typic Paleudoll
		FYh	2 5YR 3-4/2.5, dark reddish grey	2.0	33	64+	c	1.8	59	0.5	ab-sb	vfr-fr	m3	73+	16	.	.	.	.	.	.	.	2.5YR 4/4, reddish brown	1.16	0	.	.	oxic Argiudoll and typic Paleudoll
		U1Bh	1 5YR 3/3, dark reddish brown	2.0	56	53	g	1.4	80	0.2	ab	vfr-fr	c2	51	11	.	.	.	.	.	.	.	2.5YR 3/6, dark red	0	0	.	.	oxic Argiudoll and typic Paleudoll
		U3Bh	4 7.5-5YR 3/2, dark brown to dark reddish brown	3.0	40	58	c	0.8-1.3	30	0.3	ab	vfr	f1	50	16-24	.	.	.	.	2.1-2.5	1.6-1.7	96-114	5YR 3/2-2.5YR 3/6, dark reddish brown to dark red	1.25	0	.	.	oxic Argiudoll and typic Paleudoll
	luvic, haplic and mollic*	FBht	1 5YR 3/2, dark reddish brown	2.3	55	63	c	1.3	70	0.3	ab	fr	c2	54	15	.	.	.	.	.	.	.	2.5YR 3/6, dark red	0	0	.	.	oxic Argiudoll, oxic Hapludoll and typic Paleudoll
Acrisols	humic	FQh	1 5YR 2/2, dark reddish brown	2.9	43	41	c	1.4	61	0.4	ab	fr	C1	47	20	+++	0	tr	tr	.	.	.	5YR 4/4, reddish brown	0	0	.	.	oxic Tropudalf	
		U4Gh	2 5YR 3/2, dark reddish brown	1.9	19	43	c	1.4	27	0.7	ab	fr	c2	27	15	.	.	.	.	.	.	.	5YR 5/6, yellowish red	1.3	0	1,1(9)	4,3(38)	orthoxic Tropudult
	Ferral*-humic	U3Gh	5 5YR 3/2, dark reddish brown	1.7	38	18+	c	1.3	48	0.2	ab-sb	vfr-fr	f1	18+	11	+++	0	0	0	2	1.6	69	5YR 4/8, yellowish red	1.3	0	1,0(5)	tr, tr(2)	orthoxic Tropohumult	
Phaeozems and Nitrosols	luvic and dystro-mollic*	U1Xh	3 5YR 3/2, dark reddish brown	4	40	25	c	1.2	65	0.35	ab	fr	f1	15	16	+++	0	tr	0	2.1	1.6	102	2.5YR 4/6 red to reddish brown	1.1-1.3	0	15,13(76)	7,8(78)	oxic Argiudoll, Orthoxic Palehumult and orthoxic Tropohumult	
Acrisols	humic (some)	U1Xh	3 5YR 3/2, dark reddish brown	4	65	70	c	1.2	70	0.35	ab	fr	c2	40	16	+++	0	tr	0	2.1	1.6	102	5YR 4/4, red to reddish brown	1.1-1.3	0	15,13(76)	7,8(78)	oxic Argiudoll, Orthoxic Palehumult and orthoxic Tropohumult	
Luvicols	gleyic	FPg	1 5YR 3/2, dark reddish brown	1.8	41	57	c	1.8	50	0.7	sb	fr	f1	53	18	++	0	+	0	2.8	2.1	86	2.5YR 4/4, reddish brown	0	0	.	.	aquic thapto albic tropaqualfic Tropudalf	
Phaeozems	luvic	U1Ph	2 5YR 3/2-3, dark reddish brown	2.7	25	85	c	1.3	32	1.6	sb	fr	c2	83	21	++	0	+	0	3.2	2.2	95	5YR 3/3-2.5YR 3/4 to 2.5YR 3/6, dark reddish brown to dark red	1.1	0	58,8(25)	9,10(37)	oxic Argiudoll	
		U4Yhp	2 5YR 3/2, dark reddish brown	2.3	50	84	g	1.2	61	0.5	ab	fr	c2	68	18	.	0	0	0	2.3	1.7	107	reddish brown to dark red	0	0	2,0(29)	1,2(12)	oxic Argiudoll	
	Verti*-luvic	U4Bh	1 10YR 3/1, very dark grey	2	37	100	c	1.4	58	0.3	ab	fi	c2	100+	64	+	0	+	++	.	.	.	10YR 4/1, dark grey	1.3	0	.	.	vertic Argiudoll	
	Vertic*	BBh	1 5YR 2/1, black	1.5	56	100	g	1.3	70	0.37	ab	fr-fi	.	100	54	.	.	.	.	.	.	.	5YR 3/1, very dark grey	3	0	.	.	vertic udic Argiudoll
																								subsoil	0	0	.	.	
	Gleyic	U4Yg	1 5YR 4-3/2, dark reddish grey to dark reddish brown	1.4	24	90	c	1.2	28	0.7	sb	fr	.	100	39	.	.	.	.	.	.	.	5YR 3.5/1, dark grey to dark reddish brown	1.35	0	.	.	aquic Hapludoll
	haplic (paralithic phase)	U4Yhp	1 7.5YR 4/2, dark brown to brown	2.3	33	80	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		0	0	.	.	typic Hapludoll
	haplic (petroferic phase)	PXhm	1 10YR 3/2, very dark greyish brown	3	30	90	g	1	30	0.96	ab	1	.	100	.	+	0	+	0	.	.	.	7.5YR 4/2, dark brown to brown	0	0	.	.	typic Hapludoll and Hapludoll	
Luvicols & Phaeozems	orthic and luvic	U4Ybp	3 7.5YR 3/2-5YR 4/2, dark brown to dark reddish grey	43	90	g	1.3	50	0.25	ab-sb	fr-fi	.	80	20	.	.	.	.	.	.	.	.	7.5YR 4/3-5YR 4/3, brown to reddish brown	1.3	0	2,0(29)	1,2(12)	oxic Argiudoll and mollic Hapludalf
Cambisols	humic and ferralic	HBhP	1 5YR 3/3, dark reddish brown	2.4	66	34	c	1.4	63	0.5	ab	fr	c1	54	17	.	.	.	.	.	.	.	5YR 4/6, yellowish red	1.12	0	tr,0(8)	.	typic Eutropept
		U4Ghm	1 7.5YR 3/2-7.5YR 4/4 brown to dark brown	1.5	27	29	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		0	0	.	.	oxic Dystropept and oxic Humitropept
Cambisols & Arenosols	ferralic*-humic and ferralic	U4GM	1 7.5YR 3/2, dark brown	1.6	19	40	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		0	0	.	.	oxic Humitropept and typic Ustipsamment
Phaeozems & Lithosols	haplic	VXP	see units U4Yhp and HXP																										typic Hapludoll and lithic Troporthent
Rankers and Lithosols		U1Xhp	4 5YR 3/3, dark reddish brown	2.5	35	19	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		0	0	.	.	lithic oxic Humitropept
		HXP	2 5YR 3/2-3, dark reddish brown	2.4	37	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		0	0	.	.	lithic Troporthent and lithic Humitropept
Planosols	eutric	PXA	2 10YR 3/1, very dark grey	3	25	50	a	2.5	65	0.2	pr-ab	fi	c2	70	60	+	0	+++	.	.	.		1.15	0	.	.	abruptic Tropaqualf		
		PPa	1 5YR 2.5/1, black	2	29	72	a	1.8	54	0.4	ab	vfi	m3	100	75	.	.	.	.	4.7	3.5	66	10YR 2.5/1 black	1.4	2	.	.	abruptic Tropaqualf
		PGa	2 10YR 3/1-2, very dark grey to very dark greyish brown	3	24	28	a	3	73	0.17	ab	fi	m3	70	32	++	0	0	+	2.9	2.3	70	10YR 2/2 very dark brown	1.38	0	0,3(2)	0,0(100)	abruptic Tropaqualf	
		BXA2	2 7.5YR 2-3/1, very dark brown to greyish brown	3.5	28	15-35	a	2.7	72	0.19	pr/ab	fi	c2	42-66	52	++	0	+	+++	3.3	2.5	76	10YR 4/1-7.5YR 4/1, dark grey to dark greyish brown	1.27	0	.	.	abruptic Tropaqualf	
		BGA	1 10YR 3/2, very dark greyish brown	1.1	17	75	c	3.6	61	0.12	cpr/ab	vfi	c2	96	46	.	.	.	.	.	.	.	10YR 3/1, very dark grey	1.31	0	.	.	abruptic Tropaqualf
	solodic	BXA1	4 10YR 2.5/1-10YR 4/1, black to very dark grey to dark grey	2.3	28	40	a	2.5	67	0.4	cpr/ab	fi	m3	75	60	+	0	tr	+++	3.6	2.7	68	10YR 5/1-10YR 4/2, grey to dark greyish brown	1.31	0	17,8(18)	.	abruptic Tropaqualf	
Solonetz	gleyic	BXg	1 10YR 2.5/2, very dark brown to very dark greyish brown	2.1	38	54	a	1.2	44	0.7	cpr/ab	fi	c3	90	90	+	0	0	+++	.	.	.	10YR 4-5/2 dark grey to greyish brown	1.31	0	0,0(15)	2,-(52)	typic Natraqualf	
Vertisols	pellic	FBD4	2 10YR 2/2, very dark brown	2.6	38	84	a	1.4	53	0.17	pr/ab	fi	sc	100	80	+	0	0	+++	.	.	.	10YR 4.5/1, dark grey to grey	1.27	0	7,4(66)	.	typic Pelludert	
		BBd	2 10YR 4/1, dark grey	2.5-1.8	45	74	c-a	1.5	65	0.4	pr/ab	fi	m3-fi	88	57	.	.	.	.	4.4	3.2	.	10YR 4/1-3/2, dark grey to very dark greyish brown	1.27	3 in C horizon	.	.	entic Pelludert
Histosols	dystic	BXo	2 5YR 3/3-10YR 2/2, dark reddish brown to very dark greyish brown	10- >30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		0.2-1.0	0	20,40(74)	7,5(86)	typic Tropohemist

- Prefixes marked with * are tentative terms, awaiting international agreement on nomenclature for intergrading soil units
- Calculated from CEC soil and clay % and corrected for presence of organic matter and expressed as meq/100 g clay. Numbers of meq should be multiplied with 10 to find number of mmol/kg clay as given in text
- Data refer to the subsoil (50-100 cm), unless the soil is shallow
- The data for the B horizon refer to the B2 and B3 horizon
- s.g.<2.9 g/cm³; fraction 50-250 μm percentages: W, Weatherable primary minerals P, Plant opal (0), number of opaque minerals per 100 translucent grains
- Expressed as percentages. Numbers should be multiplied by 10 to find mass fraction of organic C and divided by 100 to find weight fraction of clay and base saturation as given in text.

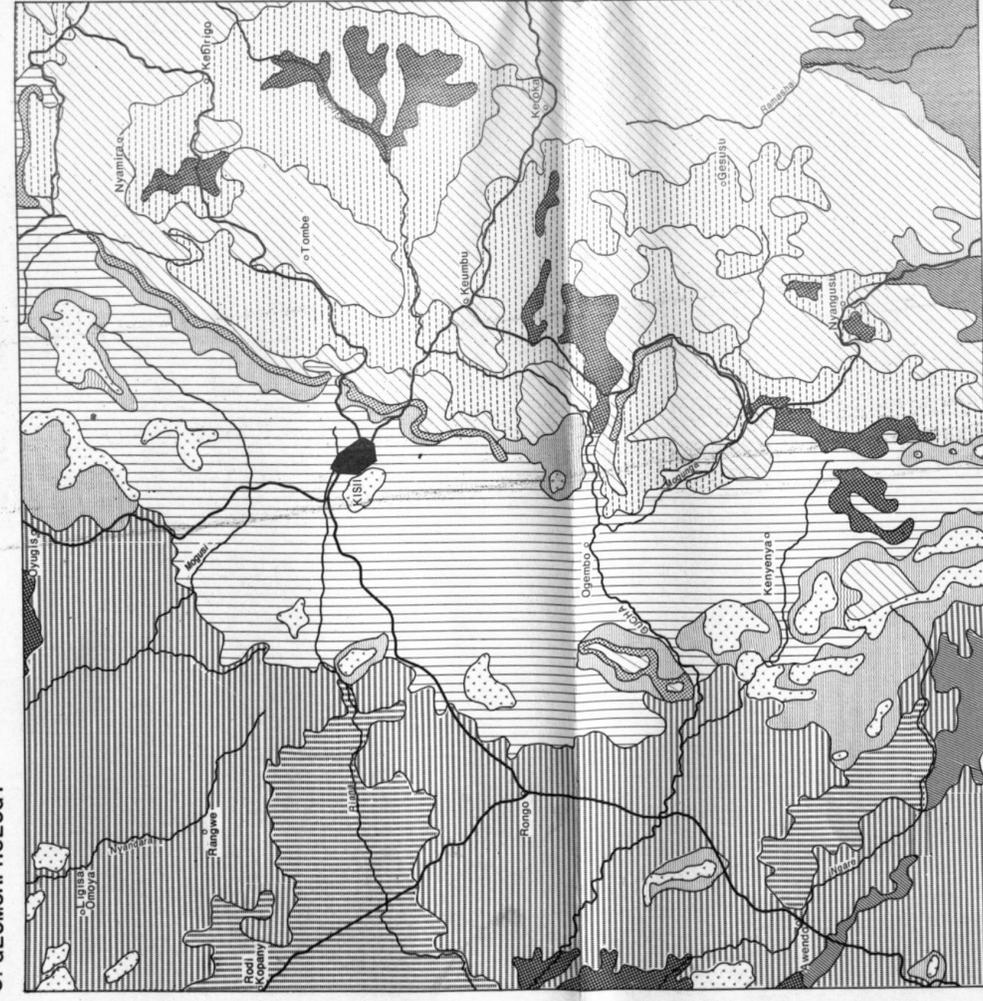
Explanation of abbreviations

transition A/B	clay cutans (field observation)
a, abrupt	(See however micromorphological laboratory data in report)
c, clear	
g, gradual	
d, diffuse	quantity grade
	f, few 1, weak/thin
	c, common 2, moderate
	m, many 3, strong
structure	
pr, prismatic	clay minerals
cpr, columnar	+++, predominant
ab, angular blocky	++, common
sb, subangular blocky	+, few
	tr, traces
consistence	
fr, friable	free carbonates
vfr, very friable	0, no effervescence with HCl
fi, firm	2, moderate effervescence with HCl
l, loose	3, strong effervescence with HCl
	., not determined
	blanc, not existant

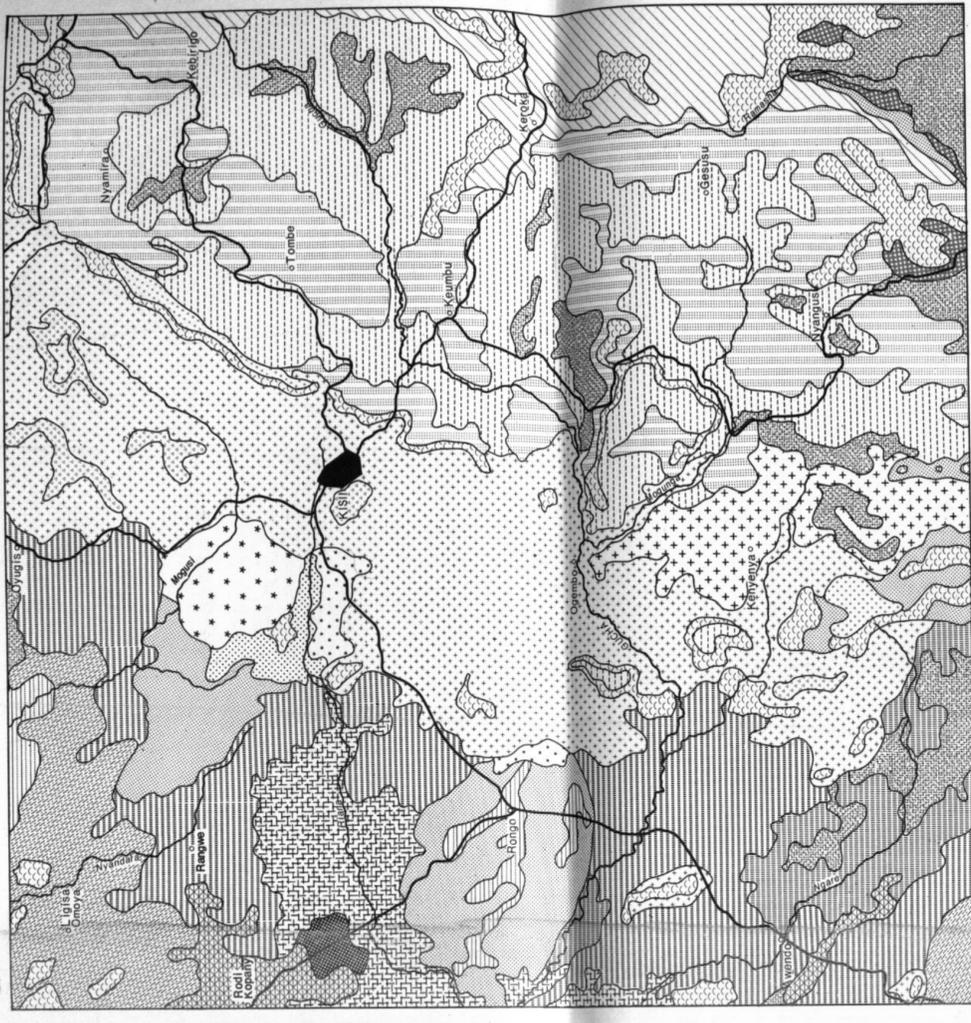
Appendix 5 to Report No. 4 "Soils of the Kisii area" by W.G. Wielemaker and H.W. Boxem.
Soil profile characteristics significant for soil classification.

Ministry of Agriculture-Kenya Soil Survey and Agricultural University, Department of Soil Science and Geology, Wageningen, the Netherlands.

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- hills
- minor scarps
- foot slopes
- Keroka erosion surface (rolling to hilly), 1800-2150m
- Magombo erosion surface (undulating to rolling), 1700-1950m
- Kisi erosion surface (rolling) 1450-1800m
- Rongo erosion surface (undulating to rolling), 1200-1500m
- plains and bottomlands
- bottomlands

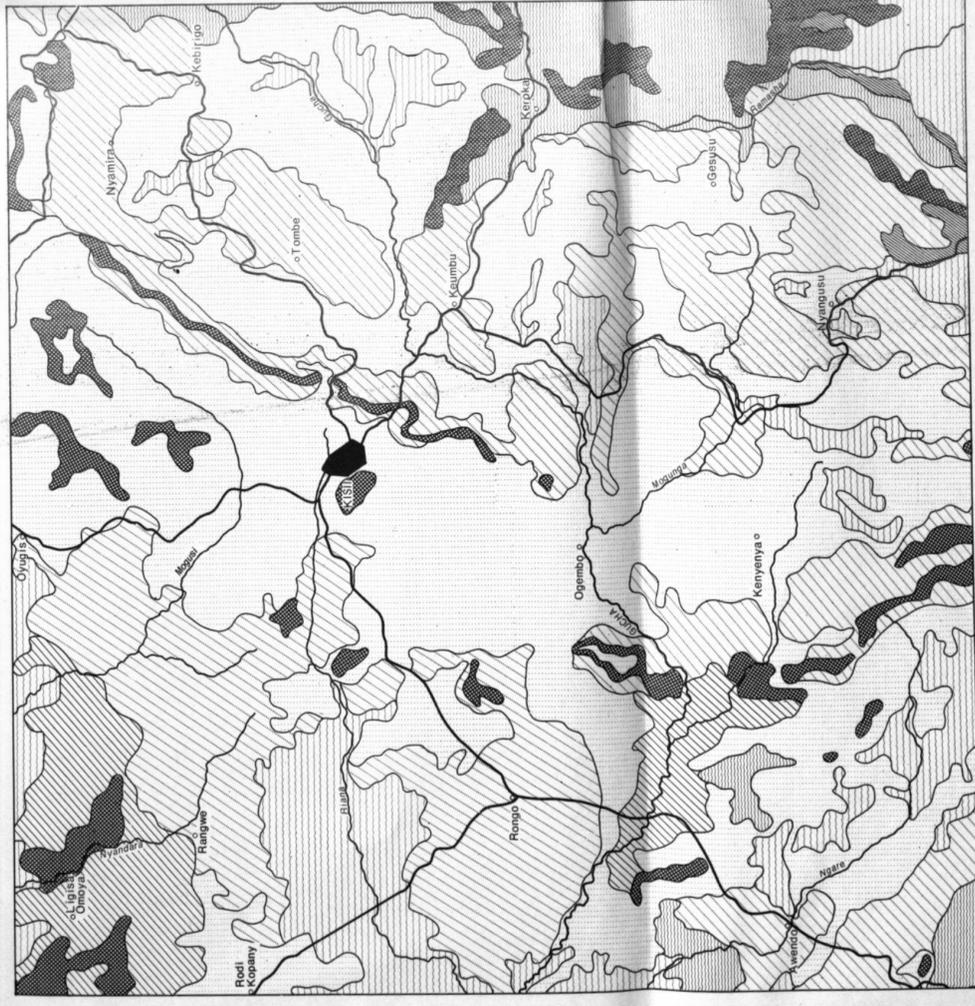


- humic Ferral soils
- Ferral-humic Acrisols
- humic Acrisols
- humic Nitisols
- humic and mollic-Nitisols
- dystric mollic-Nitisols, luvisols and some humic Acrisols
- dystric mollic-Nitisols with some eutric Planosols and dystric Histosols
- mollic Nitisols and luvisols Phaeozems
- mollic Nitisols with some eutric Planosols
- luvisols Phaeozems
- luvisols Phaeozems and orthic/chrionic Luvisols
- gleyic Phaeozems
- luvisols and gleyic Phaeozems
- haplic, luvisols and gleyic Phaeozems
- feralitic-humic Cambisols
- humic Cambisols
- Lithosols and Rankers
- eutric Planosols
- eutric and solodic Planosols
- pellic Vertisols
- gleyic Solonetz

Prefixes marked with* are tentative terms, awaiting international agreement on nomenclature

C. GEOMORPHOLOGY

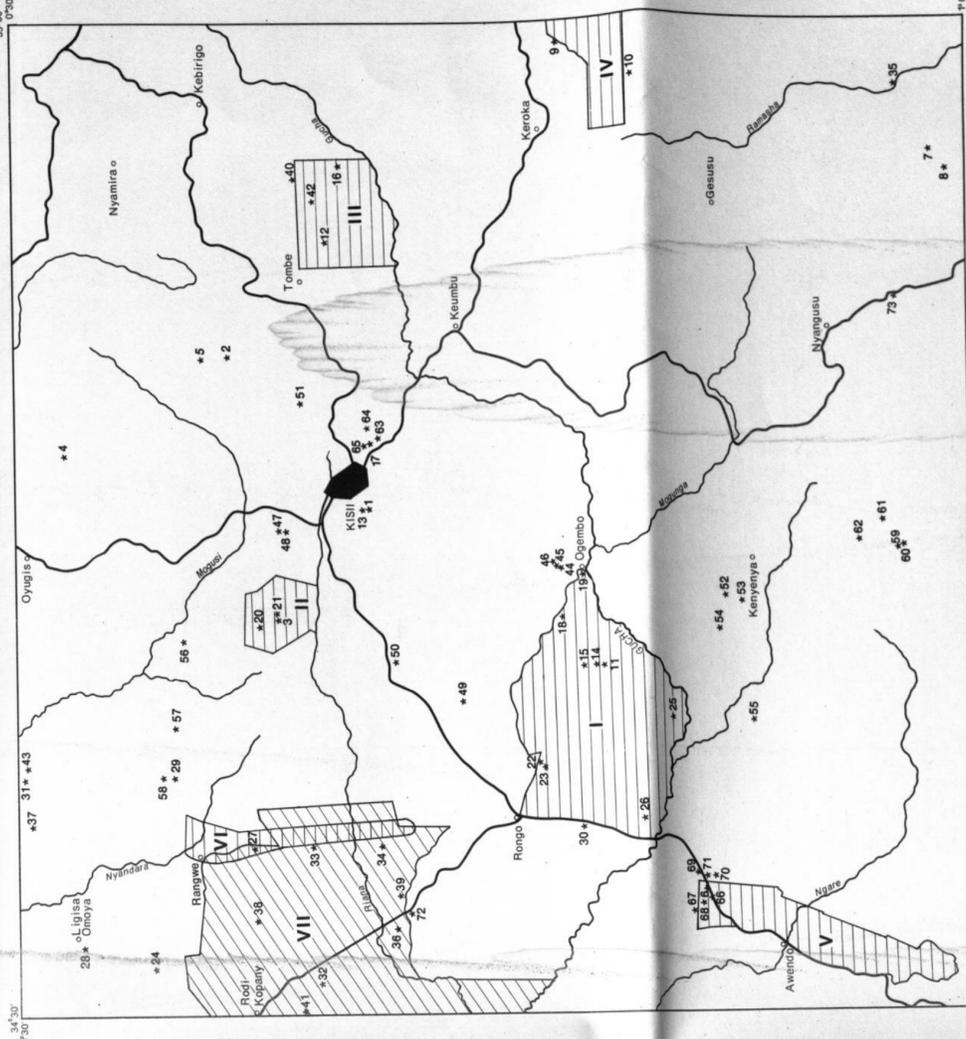
G. SOIL EROSION HAZARD (AFTER CLEARING)



- slight to moderate splash* and slight rill erosion
- moderate splash and rill erosion
- moderate rill and slight to moderate gully erosion
- moderate to strong splash and rill erosion
- strong splash and rill erosion
- strong rill and moderate gully erosion
- severe splash and rill erosion

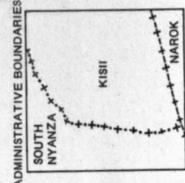
*in previous reports described as "sheet" erosion

H. LOCATION OF DETAILED SURVEYS AND REPRESENTATIVE PROFILE PITS



- *35 representative profile pit with number
- I Marongo detailed survey (P.R. no.3)
- II Rongwa detailed survey (P.R. no.17)
- III East Konyango semi-detailed survey, sheet 3010 A/B (D.O.S./Min. of Agric., Nairobi)
- IV Nyanjongo detailed survey (P.R. no.18)
- V Ranen detailed survey (P.R. no. 16)
- VI Rangwa detailed survey (P.R. no.17)
- VII East Konyango semi-detailed survey, sheet 3010 A/B (D.O.S./Min. of Agric., Nairobi)

ADMINISTRATIVE BOUNDARIES



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compilation of maps B, C, D, G w. G. Wismaker 1)
compilation of maps A, E, F, H H. W. Bozem 2)
map correlation B. J. A. van der Pouter 2)
cartography D. M. Oluo and 2)
C. N. Muehlem 2)

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1) Agric. University, Wageningen
2) Kenya Soil Survey

