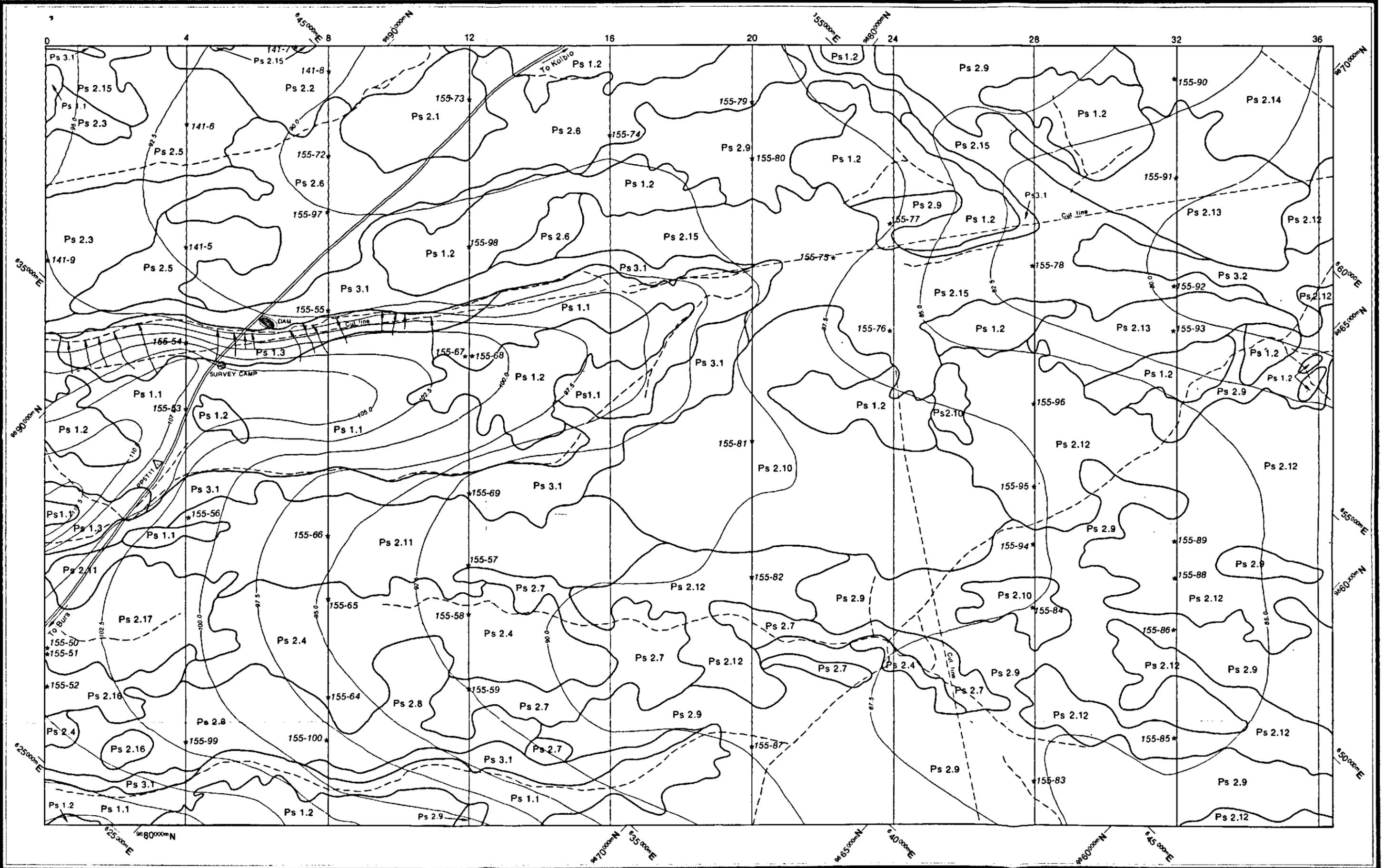


RECONNAISSANCE SOIL MAP OF THE PROPOSED BURA EAST IRRIGATION SETTLEMENT



SCALE 1:100,000



1sq cm 100ha

Base map derived from topographical map surveyed by Geosurvey Scale 1:50,000

LEGEND

Ps SEDIMENTARY PLAINS (slopes less than 2%)

All soils are developed on Tertiary/Quaternary marine/Lacustrine sediments

SYMBOL	GENERAL DESCRIPTION		CALCAREOUSNESS		SALINITY		SODICITY		CLASSIFICATION		
	SUBSOIL	TOPSOIL	NON-CALCAREOUS	CALCAREOUS	NON-SALINE	SALINE	NON-SODIC	SODIC	FAO/UNESCO (1974)	FAO-REVISED (1987)	SOIL TAXONOMY (USDA, 1975)
Ps1 SLIGHTLY HIGH-LYING LAND											
Ps 1.1	imperfectly drained, very deep, greyish brown to dark greyish brown, firm sandy clay to clay with a clear hardpan	10-15cm of dark greyish brown to very dark greyish brown, friable, sandy clay loam to sandy clay	0-10/15cm	>10/15cm strongly calcareous	0-10/15cm	>10/15cm moderately to strongly saline	-	0-10/15cm slightly to moderately sodic; >10/15cm moderately to strongly sodic	gleyic SOLONETZ, saline phase	Calcari-gleyic SOLONETZ, salic phase	Typic and Aquic NATRARGIDS
Ps 1.2	As Ps 1.1	As Ps 1.1, but in places 15-40cm deep	0-10/40cm non to slightly calcareous	>10/40cm strongly calcareous	0-10/40cm	>10/40cm moderately to strongly saline	-	0-10/40cm slightly to moderately sodic; >10/40cm moderately to strongly sodic	gleyic SOLONETZ, saline phase	Calcari-gleyic SOLONETZ, salic phase	Typic and Aquic NATRARGIDS
Ps 1.3	imperfectly drained, very deep, brown to dark greyish brown, firm sandy clay to clay with a clear hardpan	10-30cm of dark brown to very dark greyish brown, friable, sandy clay loam to sandy clay	-	0-10/30cm slightly calcareous; >10/30cm strongly calcareous	0-10/30cm	>10/30cm moderately to strongly saline	-	0-10/30cm slightly sodic >10/30cm strongly sodic	gleyic SOLONETZ, saline phase	Calcari-gleyic SOLONETZ, salic phase	Typic and Aquic NATRARGIDS
Ps2 SLIGHTLY LOW-LYING LAND											
Soils which are non-saline and non to slightly sodic to a depth of at least 60cm											
Ps 2.1	moderately well drained, very deep, greyish brown to dark greyish brown, friable clay	10-30cm of greyish brown to dark greyish brown, friable clay	throughout	-	0-100/150cm	>100/150cm non to slightly saline	0-100cm	>100cm slightly to moderately sodic	luvic XEROSOLS	Gleyic LUVISOLS	Typic HAPLARGIDS
Ps 2.2	moderately well drained to imperfectly drained, very deep, greyish brown to dark greyish brown, friable to firm, clay	10-20cm of dark greyish brown to dark grey, friable to firm, clay	0-10/15cm	>10/15cm slightly to strongly calcareous	0-70/100cm	>70/100cm slightly to moderately saline	0-70/100cm	>70/100cm slightly to moderately sodic	luvic XEROSOLS	Calcari-gleyic LUVISOLS	Typic HAPLARGIDS
Ps 2.3	imperfectly drained, very deep, greyish brown to dark greyish brown, friable to firm clay	10-20cm of dark greyish brown, friable clay	-	moderately to strongly calcareous throughout	0-80/120cm	>80/120cm slightly saline	0-80/120cm non to slightly sodic	>80/120cm moderately to strongly sodic	haplic XEROSOLS, sodic phase	Calcari-gleyic and Calcari-vertic CAMBISOLS sodic phase	Typic and Natric CAMBORTHIDS
Soils which are non-saline to a depth of at least 60cm and non to slightly sodic to a depth of at least 30cm											
Ps 2.4	moderately well drained, very deep, reddish brown to dark brown, friable to firm, clay	10-30cm of dark brown, friable clay	-	moderately to strongly calcareous throughout	0-70/100cm	>70/100cm slightly to moderately saline	-	0-30/70cm slightly to moderately sodic >30/70cm strongly sodic	haplic XEROSOLS, sodic phase	Calcari-vertic and Chromi-calcic CAMBISOLS sodic phase	Typic and Natric CAMBORTHIDS
Ps 2.5	moderately well drained to imperfectly drained, very deep, grey to greyish brown, friable to firm, clay	10-20cm of dark greyish brown, friable, sandy clay to clay	-	moderately to strongly calcareous throughout	0-60/80cm	>60/80cm slightly to moderately saline	0-30 non to slightly sodic	>30cm moderately to strongly sodic	haplic XEROSOLS, saline-sodic phase	Verti-haplic and Luvi-haplic CALCISOLS salic-sodic phase	Natric CAMBORTHIDS
Ps 2.6	imperfectly drained to poorly drained, very deep, dark brown to dark grey, friable to firm, clay	15-20cm of greyish brown to dark greyish brown, friable clay	0-10/20cm non to slightly calcareous	>10/20cm moderately to strongly calcareous	0-60/80cm	>60/80cm slightly to strongly saline	0-30/60cm non to slightly sodic	>30/60cm slightly to strongly sodic	haplic XEROSOLS, saline-sodic phase	Verti-haplic and Luvi-haplic CALCISOLS salic and sodic phase	Typic and Natric CAMBORTHIDS
Ps 2.7	imperfectly drained, very deep, dark brown to dark greyish brown, friable to firm, clay	10-20cm of dark (greyish) brown, friable clay	0-10cm non to slightly calcareous	>10cm strongly calcareous	0-80/100cm	>80/100cm moderately to strongly saline	0-30cm non to slightly sodic	30-70cm slightly to moderately sodic >70cm strongly sodic	luvic XEROSOLS, saline-sodic phase	Calcari-gleyic LUVISOLS salic-sodic phase	Typic HAPLARGIDS
Soils which are non-saline and non to slightly sodic to a depth of at least 30cm											
Ps 2.8	moderately well drained to imperfectly drained, very deep, dark brown to dark greyish brown, friable to firm, clay	10-20cm of dark brown to very dark greyish brown, friable, sandy clay to clay	0-5/15cm non to slightly calcareous	>5/15cm strongly calcareous	0-35/60cm	>35/60cm slightly to strongly saline	0-35/60cm non to slightly sodic	>35/60cm moderately to strongly sodic	haplic XEROSOLS, saline-sodic phase	Verti-haplic CALCISOLS salic-sodic phase	Natric CAMBORTHIDS
Ps 2.9	imperfectly drained, very deep, brown to dark greyish brown, firm clay	10-20cm of dark greyish brown to dark grey, friable to firm, sandy clay to clay	-	moderately to strongly calcareous throughout	0-40/60cm	>40/60cm moderately to strongly saline	0-30/60cm non to slightly sodic	>30/60cm strongly sodic	orthic SOLONETZ, saline phase	Calcari-haplic SOLONETZ salic phase	Typic NATRARGIDS
Soils which are non-saline to a depth of at least 30cm and sodic(almost) throughout											
Ps 2.10	imperfectly drained, very deep, greyish brown to dark greyish brown, firm clay	10-20cm of dark greyish brown, friable to firm, sandy clay	0-5/15cm non to slightly calcareous	>5/15cm strongly calcareous	0-40/60cm non to slightly saline	>40/60cm moderately to strongly saline	0-10cm non to slightly sodic	>10cm moderately to strongly sodic	orthic and gleyic SOLONETZ saline phase	Calcari-haplic and Calcari-gleyic SOLONETZ salic phase	Typic and Aquic NATRARGIDS
Ps 2.11	imperfectly drained to poorly drained, very deep, greyish brown to dark greyish brown, friable to firm, clay	10-25cm of dark brown to dark greyish brown, friable, sandy clay to clay	-	strongly calcareous throughout	0-30/60cm	>30/60cm moderately to strongly saline	-	0-60cm slightly to moderately sodic; >60cm moderately to strongly sodic	haplic XEROSOLS, saline-sodic phase	Calcari-gleyic CAMBISOLS and Calcari-gleyic LUVISOLS, salic-sodic phase	Typic and Natric CAMBORTHIDS
Ps 2.12	imperfectly drained to poorly drained, very deep, dark brown to very dark greyish brown, firm clay	10-20cm of very dark greyish brown, friable to firm clay	0-10cm non to slightly calcareous	>10cm moderately to strongly calcareous	0-30/50cm non to slightly saline	>30/50cm moderately to strongly saline	-	moderately to strongly sodic throughout	haplic XEROSOLS, saline-sodic phase and orthic SOLONETZ, saline and gleyic phase	Calcari-gleyic CAMBISOLS Calcari-haplic and Calcari-gleyic SOLONETZ salic phase	Natric CAMBORTHIDS and Typic and Aquic NATRARGIDS
Ps 2.13	imperfectly drained to poorly drained, very deep, dark brown to dark greyish brown, firm clay	10cm of dark brown, to very dark greyish brown, friable to firm, clay	-	strongly calcareous throughout	0-30/40cm non to slightly saline	>30/40cm moderately to strongly saline	-	0-30/40cm slightly sodic >30/40cm moderately sodic	orthic SOLONETZ, saline phase	Calcari-haplic and Calcari-gleyic SOLONETZ salic phase	Typic and Aquic NATRARGIDS
Soils which are both saline and sodic (almost) throughout											
Ps 2.14	imperfectly drained to poorly drained, very deep, dark greyish brown, firm clay	10-20cm of dark greyish brown to dark grey, friable to firm, clay	-	moderately to strongly calcareous throughout	0-5/10cm	>5/10cm moderately to strongly saline	0-10/20cm	>10/20cm slightly to strongly sodic	orthic and gleyic SOLONETZ saline phase	Calcari-haplic and Calcari-gleyic SOLONETZ salic phase	Typic and Aquic NATRARGIDS
Ps 2.15	imperfectly drained to poorly drained, very deep, greyish brown to dark greyish brown, firm clay	10-20cm of dark greyish brown to grey, friable to firm, clay	-	moderately to strongly calcareous throughout	0-20/35cm	>20/35cm moderately to strongly saline	0-10/40cm non to slightly sodic	>10/40cm moderately to strongly sodic	haplic XEROSOLS, saline-sodic phase	Verti-haplic CALCISOLS and Calcari-vertic CAMBISOLS salic-sodic phase	Typic and Natric CAMBORTHIDS
Soil associations											
Ps 2.16	Association of: -moderately well drained, very deep, dark brown, friable clay -moderately well drained to imperfectly drained, very deep, dark reddish brown to dark brown, friable, sandy clay to clay	10-20cm of dark brown to dark greyish brown, friable, sandy clay to clay 20-30cm of dark brown, friable, sandy loam to sandy clay	0-10/20cm 0-20/30cm	>10/20cm moderately to strongly calcareous >20/30cm moderately to strongly calcareous	0-60cm 0-20/30cm	>60cm moderately to strongly saline >20/30cm moderately to strongly saline	0-40/60cm non to slightly sodic 0-20/30cm	>40/60cm moderately to strongly sodic >20/30cm slightly to moderately sodic	haplic XEROSOLS, saline-sodic phase -	Luvi-haplic CALCISOLS salic-sodic phase	Typic CAMBORTHIDS
Ps 2.17	Association of: -moderately well drained, very deep, reddish brown to dark reddish brown, friable to firm, clay -moderately well drained to imperfectly drained, very deep, reddish brown to brown, friable to firm, clay	20-30cm of reddish brown to dark reddish brown, friable, sandy loam to sandy clay 10-20cm of dark greyish brown, friable, clay	0-60/70cm 0-15cm non to slightly calcareous	>60/70cm moderately to strongly calcareous >15cm strongly calcareous	0-35/60cm 0-60/80cm	>35/60cm slightly to moderately saline >60/80cm moderately to strongly saline	0-10/30cm non to slightly sodic 0-40/70cm non to slightly sodic	>10/30cm moderately sodic >40/70cm moderately to strongly sodic	luvic XEROSOLS, saline-sodic phase orthic SOLONETZ, saline phase	Calcari-chromic LUVISOLS salic-sodic phase Calcari-haplic SOLONETZ salic phase	Typic PALEARGIDS Typic NATRARGIDS
Ps3 LOW LYING LAND											
Ps 3.1	poorly drained, very deep, dark grey to dark greyish brown, firm to very firm, cracking clay	10-15cm of grey to dark grey, friable to firm, clay	-	moderately to strongly calcareous throughout	0-30/40cm non to slightly saline	>30/40cm moderately to strongly saline	0-30/40cm non to slightly sodic	>30/40cm moderately to strongly sodic	chromic VERTISOLS, saline-sodic phase	Chromi-calcic VERTISOLS salic-sodic phase	Typic TORRETS
Ps 3.2	poorly drained to very poorly drained, deep, grey to dark grey, firm clay	10cm of dark greyish brown to dark grey, friable clay	-	moderately to strongly calcareous throughout	0-30/40cm	>30/40cm slightly to strongly saline	-	moderately to strongly sodic throughout	-	-	-

KEY TO DEPTH CLASSES

thickness soil in cm	symbol +		name
	over rock	over petroplinthite	
0 - 50			shallow
50 - 80			moderately deep
80 - 120			deep
> 120			very deep

KEY TO SALINITY CLASSES

ECe (mmhos/cm)	EC (1:2.5) (mmhos/cm)	salinity classes
0 - 4	0 - 0.9	non - saline
4 - 8	0.9 - 2.0	slightly saline
8 - 16	2.0 - 4.0	moderately saline
> 16	>4.0	strongly saline

KEY TO SODICITY CLASSES

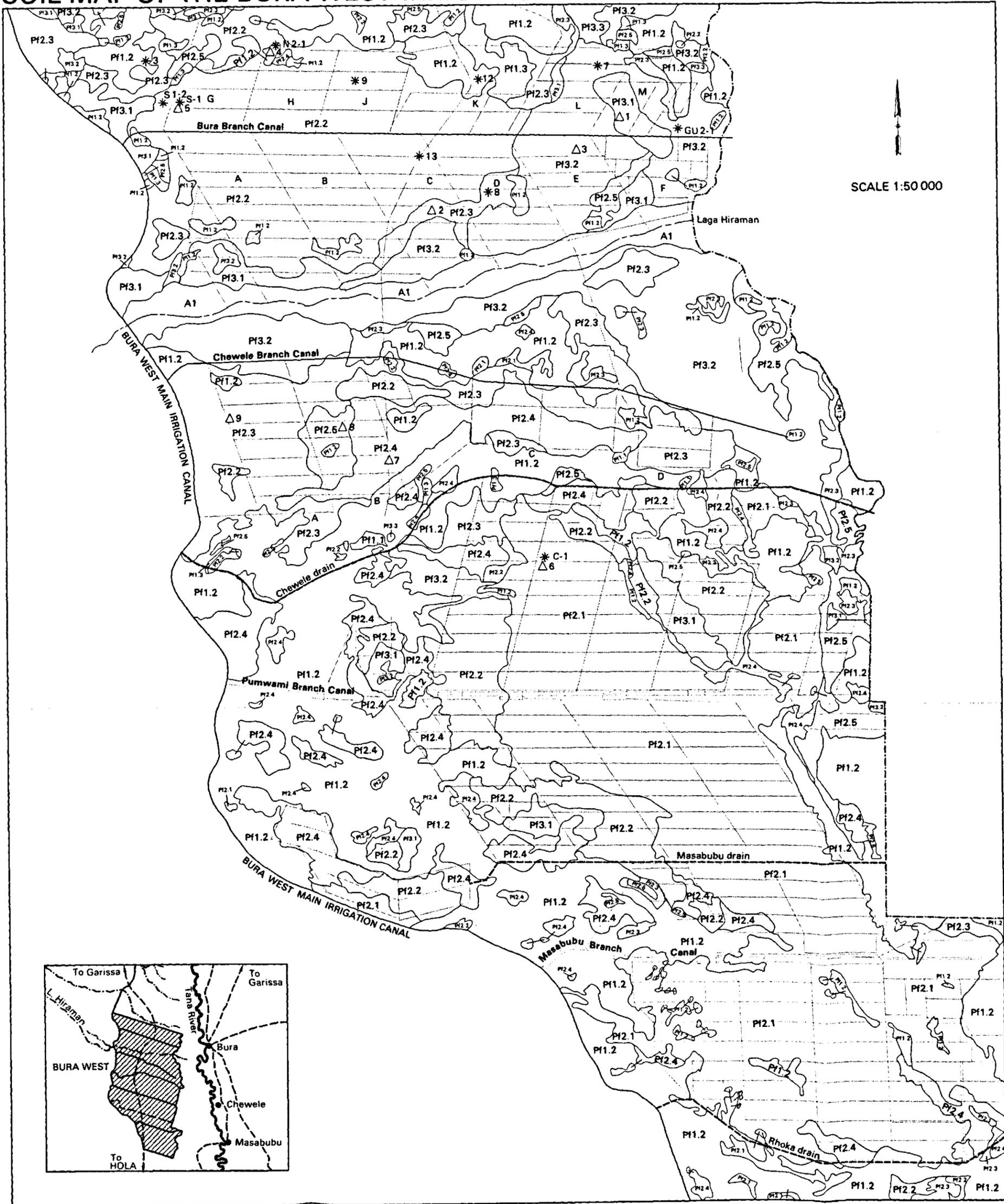
ESP	CLASS
0 - 5%	non - sodic
5 - 10%	slightly sodic
10 - 15%	moderately sodic
> 15%	strongly sodic

KEY

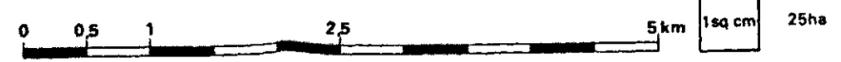
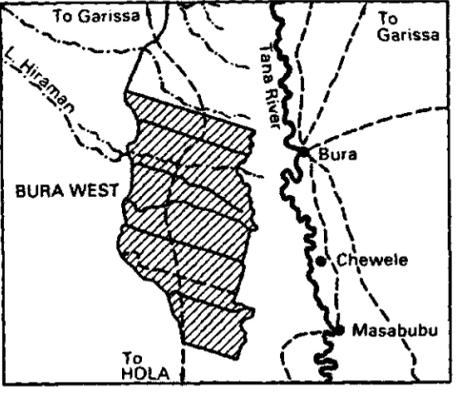
- Ps 3.1 soil mapping symbol
- * 155-87 representative profile pit with reference number
- soil boundary
- main road
- motorable track
- river
- 82.5 contours V.I. 2.5m
- 80.0



SOIL MAP OF THE BURA WEST IRRIGATION SCHEME



SCALE 1:50 000



* Soil map reduced from ILACO S (1975) soil map on scale 1:10 000
 Legend based on data of Acres/ILACO (1967), KSS (1976) and
 additional data collected by the author in 1985 and 1986.

LEGEND

SYMBOL	GENERAL DESCRIPTION		CALCAREOUSNESS		SALINITY		SODICITY		CLASSIFICATION		
	SUBSOIL	TOPSOIL	NON-CALCAREOUS	CALCAREOUS	NON-SALINE	SALINE	NON-SODIC	SODIC	FAO/UNESCO (1974)	FAO—REVISED (1987)	SOIL TAXONOMY (USDA, 1975)
P PLAINS											
Pf SEDIMENTARY PLAIN OF LARGE ALLUVIAL FANS All soils are developed on Old Alluvial deposits											
Pf1 SLIGHTLY HIGH—LYING LAND											
Pf 1.1	well drained to moderately well drained, very deep, brown to dark brown, firm, sandy clay loam to clay with a clear hardpan	50-90cm of dark reddish brown to dark brown, loose sand to sandy loam	0-90cm	>90cm slightly to moderately calcareous	0-70/115cm	>70/115cm slightly to strongly saline	0-50/90cm	>50/90cm moderately to strongly sodic	Orthic SOLONETZ partly saline phase	Haplic SOLONETZ partly salic phase	Typic NATRARGIDS
Pf 1.2	moderately well drained to imperfectly drained, very deep, dark reddish brown to dark brown, firm, sandy clay to clay	15-40cm of dark red to reddish brown, loose sand to sandy clay loam	0-15/40cm	>15/40cm moderately to strongly calcareous	0-15/40cm	>15/40cm strongly saline	0-15/40cm non to slightly sodic	>15/40cm moderately to strongly sodic	Orthic SOLONETZ saline phase	Calcari-haplic SOLONETZ salic phase	Typic NATRARGIDS
Pf 1.3	moderately well drained to imperfectly drained, very deep, dark brown to dark greyish brown, firm, sandy clay to clay	2-15cm of dark red to dark brown, loose to friable, loamy sand to sandy clay loam	0-10/15cm	>10/15cm moderately to strongly calcareous	0-10/15cm	>10/15cm strongly saline	0-10/15cm non to slightly sodic	>10/15cm strongly sodic	Orthic SOLONETZ saline phase	Calcari-haplic SOLONETZ salic phase	Typic NATRARGIDS
Pf2 SLIGHTLY LOW—LYING LAND											
Pf 2.1	well drained, very deep, dark reddish brown to dark brown, friable, sandy clay to clay	10-30cm of dark red to reddish brown, friable, sandy clay loam to sandy clay	0-15/50cm	15/50cm slightly to moderately calcareous	0-100/125cm	>100/125cm slightly saline	0-60/125cm	>60/125cm slightly to strongly sodic	Haplic XEROSOLS partly sodic phase	Chromi-calcaric CAMBISOLS partly sodic phase	Typic CAMBORTHIDS
Pf 2.2	well drained, very deep, dark red to dark reddish brown, friable to firm, sandy clay to clay	20-30cm of dark red to reddish brown friable, sandy clay loam to sandy clay	—	moderately to strongly calcareous throughout	0-20/40cm	>20/40cm moderately to strongly saline	0-20/40cm non to slightly sodic	>20/40cm moderately to strongly sodic	Haplic XEROSOLS saline-sodic phase	Chromi-calcaric CAMBISOLS salic-sodic phase	Typic and Natric CAMBORTHIDS
Pf 2.3	As Pf 2.2	As Pf 2.2 but 10-20cm deep	—	As Pf 2.2	0-10/20cm	>10/20cm moderately to strongly saline	0-10/20cm non to slightly sodic	>10/20cm moderately to strongly sodic	Haplic XEROSOLS saline-sodic phase	Chromi-calcaric CAMBISOLS salic-sodic phase	Typic and Natric CAMBORTHIDS
Pf 2.4	well drained to moderately well drained, very deep, dark reddish brown, firm clay	15-30cm of dark reddish brown, friable, sandy clay loam to sandy clay	0-15/30cm non to slightly calcareous	>15/30cm moderately to strongly calcareous	0-60/70cm	>60/70cm strongly saline	0-15/30cm	>15/30cm strongly sodic	Orthic SOLONETZ saline phase	Calcari-haplic SOLONETZ salic phase	Typic NATRARGIDS
Pf 2.5	well drained to moderately well drained, very deep, reddish brown to dark reddish brown, firm clay	10-15cm of reddish brown to brown, friable, sandy clay loam to sandy clay	0-10/15cm non to slightly calcareous	>10/15cm moderately to strongly calcareous	0-40/50cm	>40/50cm moderately to strongly saline	0-10/15cm	>10/15cm strongly sodic	Orthic SOLONETZ saline phase	Calcari-haplic SOLONETZ salic phase	Typic NATRARGIDS
Pf3 LOW—LYING LAND											
Pf 3.1	moderately well drained to imperfectly drained, very deep, dark reddish brown to dark brown, firm, cracking clay	15-30cm of reddish brown to dark brown, friable, sandy clay to clay	—	strongly calcareous throughout	0-20/60cm	>20/60cm moderately to strongly saline	0-20/30cm	>20/30cm moderately to strongly sodic	Chromic VERTISOLS saline-sodic phase	Chromi-calcaric VERTISOLS salic-sodic phase	Typic TORRETS
Pf 3.2	moderately well drained to imperfectly drained, very deep, dark reddish brown, firm to very firm, cracking clay	10-15cm of dark reddish brown, friable, sandy clay to clay	—	strongly calcareous throughout	0-15/30cm	>15/30cm moderately to strongly saline	0-10/15cm	>10/15cm moderately to strongly sodic	Chromic VERTISOLS saline-sodic phase	Chromi-calcaric and Chromi-haplic VERTISOLS salic-sodic phase	Typic TORRETS
Pf 3.3	imperfectly drained to poorly drained, very deep, dark brown to dark greyish brown, firm to very firm, cracking clay	15-20cm of dark brown, friable, sandy clay to clay	—	strongly calcareous throughout	0-50/70cm	>50/70cm moderately to strongly saline	0-15/25cm	>15/25cm strongly sodic	Chromic VERTISOLS saline-sodic phase	Chromi-calcaric VERTISOLS salic-sodic phase	Typic TORRETS
A FLOODPLAIN (low-lying lands of the Tana Floodplain) Soils developed on Young Alluvial deposits											
A1	imperfectly drained, very deep, dark brown to brown, firm to very firm, stratified, cracking clay	15-20cm of dark brown to brown, friable, sandy clay to clay	0-20/30cm non to slightly calcareous	>20/30cm slightly to moderately calcareous	0-70/100cm	>70/100cm slightly to moderately saline	0-20/30cm non to slightly sodic	>20/30cm moderately to strongly sodic	Calcaric FLUVISOLS sodic phase, in places saline phase	Verti-calcaric FLUVISOLS sodic phase, in places salic phase	Vertic TORRIFLUVENTS

KEY TO DEPTH CLASSES

thickness soil in cm	symbol †		name
	over rock	over petro-plinthite	
0 - 50			shallow
50 - 80			moderately deep
80 - 120			deep
> 120			very deep

KEY TO SALINITY CLASSES

ECe (mmhos/cm)	EC (1:2.5) (mmhos/cm)	salinity classes
0 - 4	0 - 0.9	non - saline
4 - 8	0.9 - 2.0	slightly saline
8 - 16	2.0 - 4.0	moderately saline
> 16	>4.0	strongly saline

KEY TO SODICITY CLASSES

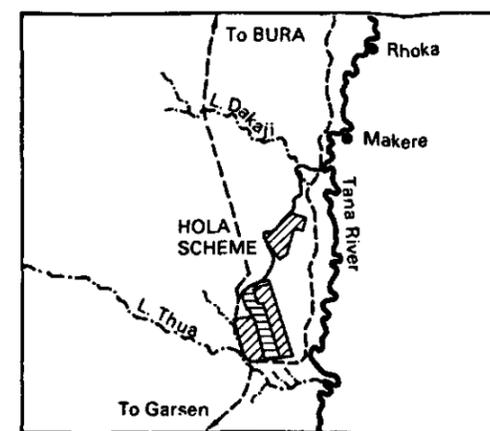
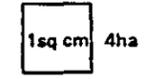
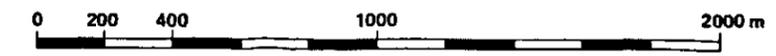
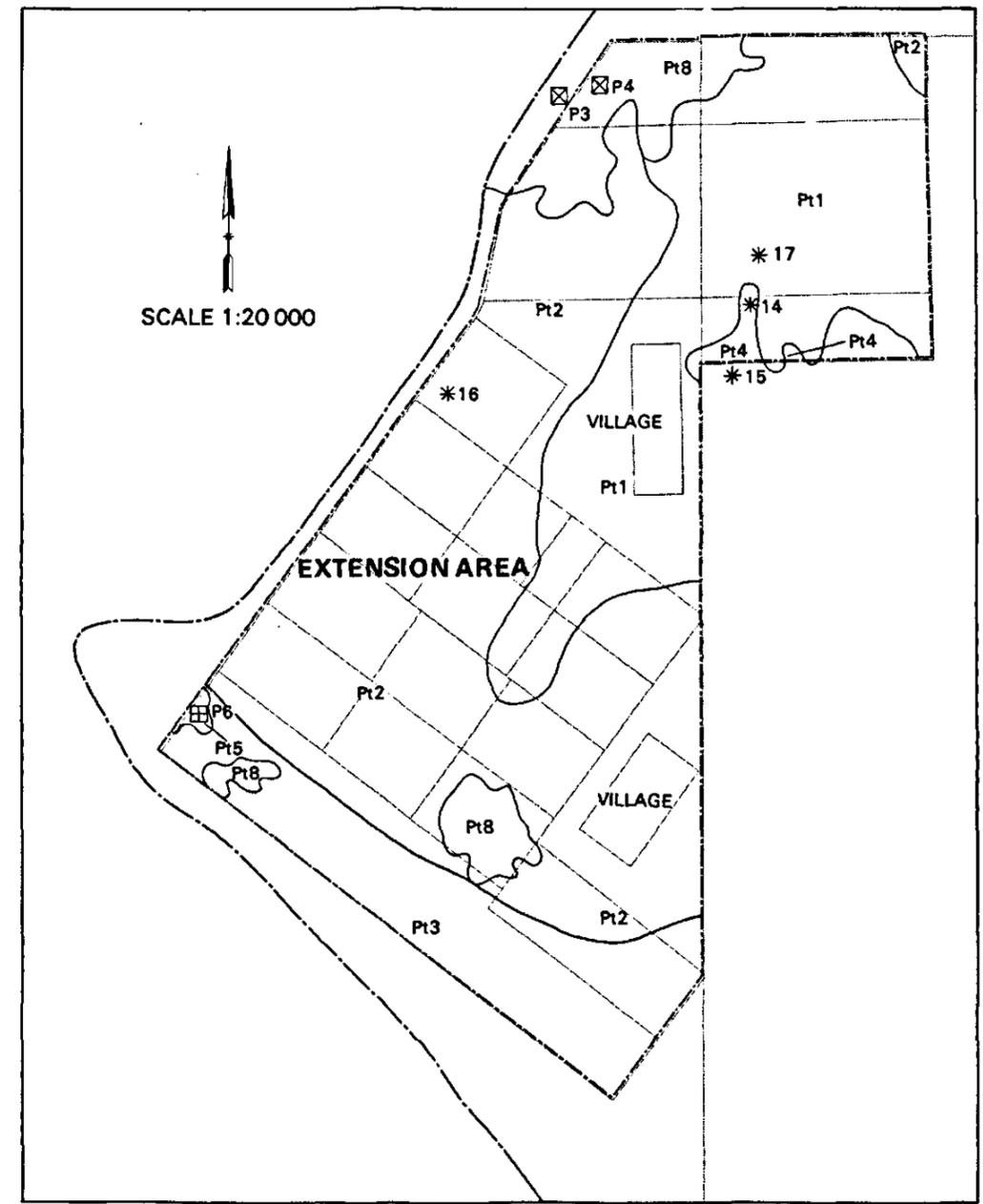
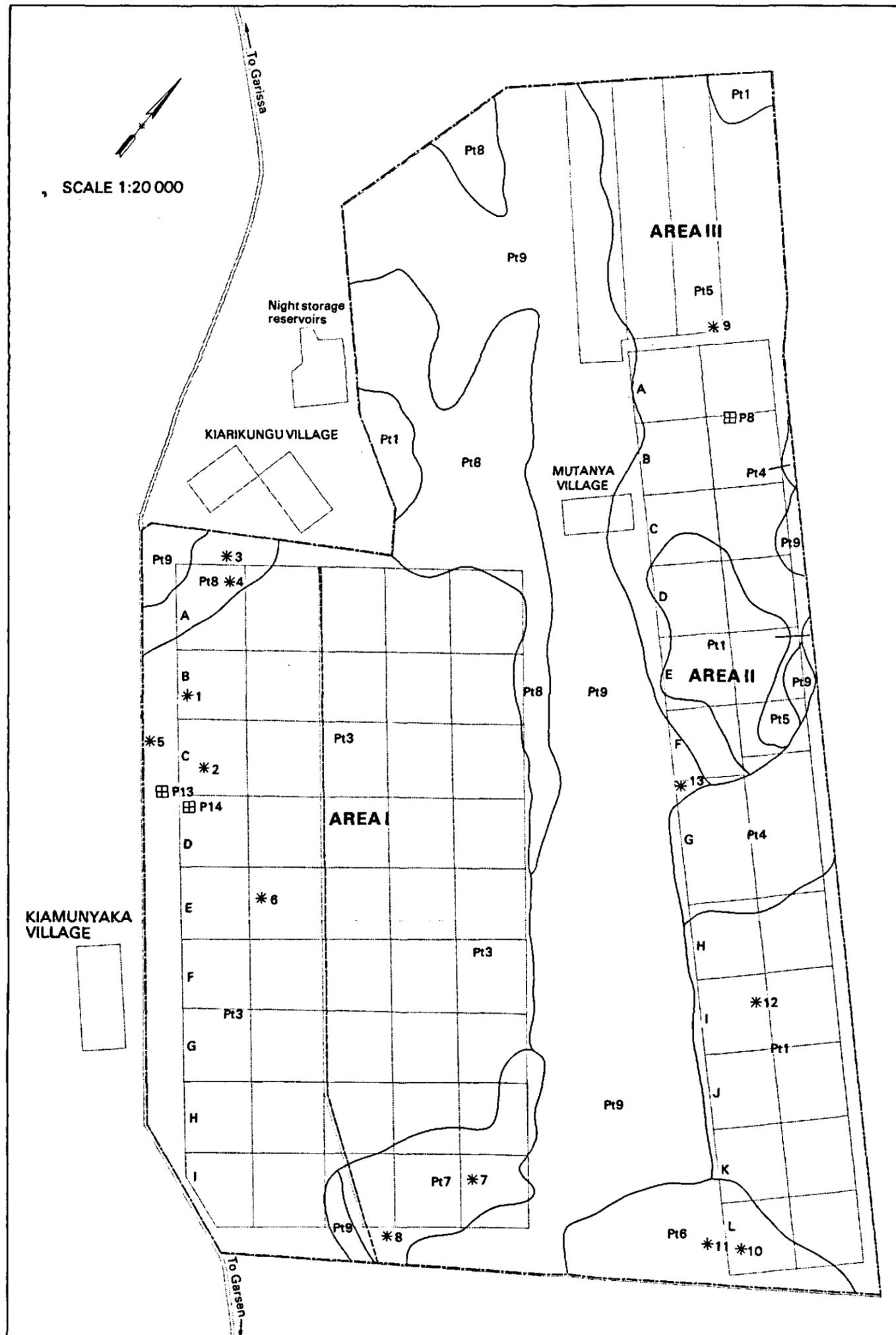
ESP	CLASS
0 - 5%	non - sodic
5 - 10%	slightly sodic
10 - 15%	moderately sodic
> 15%	strongly sodic

KEY

Pf2.1	soil mapping symbol	----	drain
—	road	* B	Profile with number
~	soil boundary	△ 6	Sampling sites for pF data
---	boundary of study area		
—	canal		
—	river		



SOIL MAP OF THE HOLA IRRIGATION SCHEME



* Soil map boundaries according to ILACO (1968) and ILACO/KSS (1976). Legend based on data from ILACO (1968), KSS (1976 and 1978) and additional data collected by the author in 1985 and 1986.

LEGEND

SYMBOL	GENERAL DESCRIPTION		CALCAREOUSNESS		SALINITY		SODICITY		CLASSIFICATION		
	SUBSOIL	TOPSOIL	NON-CALCAREOUS	CALCAREOUS	NON-SALINE	SALINE	NON-SODIC	SODIC	FAO/UNESCO (1974)	FAO-REVISED (1987)	SOIL TAXONOMY (USDA 1975)
<p>P PLAINS Pt SEDIMENTARY PLAIN OF UPPER TANA RIVER TERRACE All soils developed on Old Alluvial deposits</p>											
Pt1	well drained to moderately well drained, very deep, dark reddish brown to dark brown, friable to firm, sandy clay to clay	20- 40cm of dark brown, friable sandy clay	—	moderately to strongly calcareous throughout	0-70/100cm (irrigated) 0-15/45cm (non-irrigated)	>70/100cm slightly to strongly saline >15/45cm slightly to strongly saline	0-40/50cm (irrigated) 0-15/25cm (non-irrigated)	>40/50cm moderately to strongly sodic >15/25cm moderately to strongly sodic	Haplic XEROSOLS sodic phase (saline-sodic phase) Orthic SOLONETZ saline phase	Chromi-calcic and Calcargleyic CAMBISOLS sodic phase (salic-sodic phase) calcari-haplic SOLONETZ salic phase	Natric CAMBORTHIDS Typic NATRARGIDS
Pt2	as Pt1	as Pt1 but 10 to 20cm deep	—	as Pt1	as Pt1	as Pt1	0-10/20cm (irrigated) 0-10/15cm (non-irrigated)	>10/20cm strongly sodic >10/15cm strongly sodic	Haplic XEROSOLS sodic phase (saline-sodic phase) Orthic SOLONETZ saline phase	Chromi-calcic CAMBISOLS sodic phase (salic-sodic phase) Calcari-haplic SOLONETZ salic phase	Natric CAMBORTHIDS Typic NATRARGIDS
Pt3	well drained to moderately well drained, very deep, dark reddish brown to dark brown, friable to firm, clay; in places cracking	20-30cm of dark reddish brown to dark brown, friable clay	—	moderately to strongly calcareous throughout	0-50/100cm (irrigated) 0-10/20cm (non-irrigated)	>50/100cm moderately to strongly saline >10/20cm moderately to strongly saline, in places moderately to strongly saline from the surface	0-20/30cm non to slightly sodic (irrigated) 0-10/20cm non to slightly sodic (non-irrigated)	>20/30cm moderately to strongly sodic (irrigated) >10/20cm moderately to strongly sodic (non-irrigated)	Haplic XEROSOLS saline-sodic phase, Orthic SOLONETZ saline phase	Calcari-vertic CAMBISOLS salic-sodic phase Calcari-haplic SOLONETZ salic phase	Natric CAMBORTHIDS Vertic CAMBORTHIDS Ustollic NATRARGIDS (irrigated)
Pt4	moderately well drained to imperfectly drained, very deep, reddish brown to dark brown, friable to firm, sandy clay to clay	5-35cm of reddish brown to greyish brown, loose to friable, loamy sand to sandy clay	0-30/35cm non to slightly calcareous	>30/35cm moderately to strongly calcareous	0-10/15cm	>10/15cm slightly to strongly saline	0-5/10cm	>5/10cm strongly sodic	Orthic SOLONETZ saline phase	Calcari-haplic SOLONETZ salic phase	Typic NATRARGIDS
Pt5	moderately well drained to imperfectly drained, very deep, dark reddish brown to dark greyish brown, firm clay	20-30cm of dark brown to dark greyish brown, friable, sandy clay to clay	0-20/30cm non to slightly calcareous	>20/30cm moderately to strongly calcareous	0-40/70cm (irrigated) 0-20/40cm (non-irrigated)	>40/70cm moderately to strongly saline >20/40cm moderately to strongly saline	0-30/40cm (irrigated) 0-15/30cm (non-irrigated)	>30/40cm moderately to strongly sodic >15/30cm strongly sodic	Orthic SOLONETZ saline phase	Calcari-haplic SOLONETZ salic phase	Ustollic NATRARGIDS (irrigated) Typic NATRARGIDS
Pt6	moderately well drained to imperfectly drained, very deep, dark brown, firm clay	15-25cm of brown to dark brown, friable, sandy clay to clay	0-15/25cm non to slightly calcareous	>15/25cm moderately to strongly calcareous	0-60/100cm (irrigated) 0-10/20cm (non-irrigated)	>60/100cm slightly to strongly saline >10/20cm slightly to strongly saline	0-25/50cm (irrigated) 0-10/20cm (non-irrigated)	>25/50cm moderately to strongly sodic >10/20cm strongly sodic	Orthic SOLONETZ saline phase	Calcari-mollic SOLONETZ salic phase Calcari-haplic SOLONETZ salic-sodic phase	Ustollic NATRARGIDS (irrigated) Typic NATRARGIDS
Pt7	moderately well drained to imperfectly drained, very deep, dark reddish brown to dark brown, firm, cracking clay	20-30cm of reddish brown to dark yellowish brown, friable, clay loam to clay	—	strongly calcareous throughout	0-45/70cm (irrigated) 0-20/30cm (non-irrigated)	>45/70cm slightly to strongly saline >20/30cm moderately to strongly saline	0-20/60cm (irrigated) 0-15/30cm (non-irrigated)	>20/60cm moderately to strongly sodic >15/30cm moderately to strongly sodic	Chromic VERTISOLS saline-sodic phase	Chromi-haplic and Chromi-calcic VERTISOLS salic-sodic phase	Typic TORRERTS
Pt8	moderately well drained to imperfectly drained, very deep, dark reddish brown to dark brown, firm to very firm, cracking clay	20-30cm of dark brown to dark yellowish brown, friable, clay loam to clay	—	strongly calcareous throughout	0-40/50cm (irrigated) 0-10/25cm (non-irrigated)	>40/50cm slightly to strongly saline >10/25cm moderately to strongly saline	0-15/30cm (irrigated) 0-10cm, in places sodic from the surface	>15/30cm moderately to strongly sodic >10cm moderately to strongly sodic	Chromic VERTISOLS saline-sodic phase	Chromi-haplic and Chromi-calcic VERTISOLS salic-sodic phase	Typic TORRERTS
Pt9	imperfectly drained, very deep, brown to dark brown, firm, cracking clay	15-20cm of dark brown, friable sandy clay to clay	—	strongly calcareous throughout	0-50/90cm	>50/90cm slightly to strongly saline	0-15/25cm, in places non to slightly sodic up to 90cm deep	>15/25cm strongly sodic	Chromic VERTISOLS saline-sodic phase haplic XEROSOLS saline-sodic phase	Chromi-calcic VERTISOLS salic-sodic phase Calcari-vertic CAMBISOLS salic-sodic phase	Typic TORRERTS Natric CAMBORTHIDS

KEY TO DEPTH CLASSES

thickness soil in cm	symbol +		name
	over rock	over petro-plinthite	
0 - 50			shallow
50 - 80			moderately deep
80 - 120			deep
> 120			very deep

KEY TO SALINITY CLASSES

ECe (mmhos/cm)	EC (1:2.5) (mmhos/cm)	salinity classes
0 - 4	0 - 0.9	non - saline
4 - 8	0.9 - 2.0	slightly saline
8 - 16	2.0 - 4.0	moderately saline
> 16	>4.0	strongly saline

KEY TO SODICITY CLASSES

ESP	CLASS
0 - 5%	non - sodic
5 - 10%	slightly sodic
10 - 15%	moderately sodic
> 15%	strongly sodic

KEY

- road
- main drainage canal
- soil boundary
- boundary of the study area
- irrigated areas
- main conveyance canal
- P14 Profile pit (1974)
- Profile pit 1985

