



**ETHIOPIA - FRANCE COOPERATIVE PROGRAM**  
**WABI SHEBELLE SURVEY**

IN COLLABORATION WITH  
 NATIONAL WATER RESOURCES COMMISSION  
 BCEOM, ORSTOM, EDF  
 IGN, B DPA

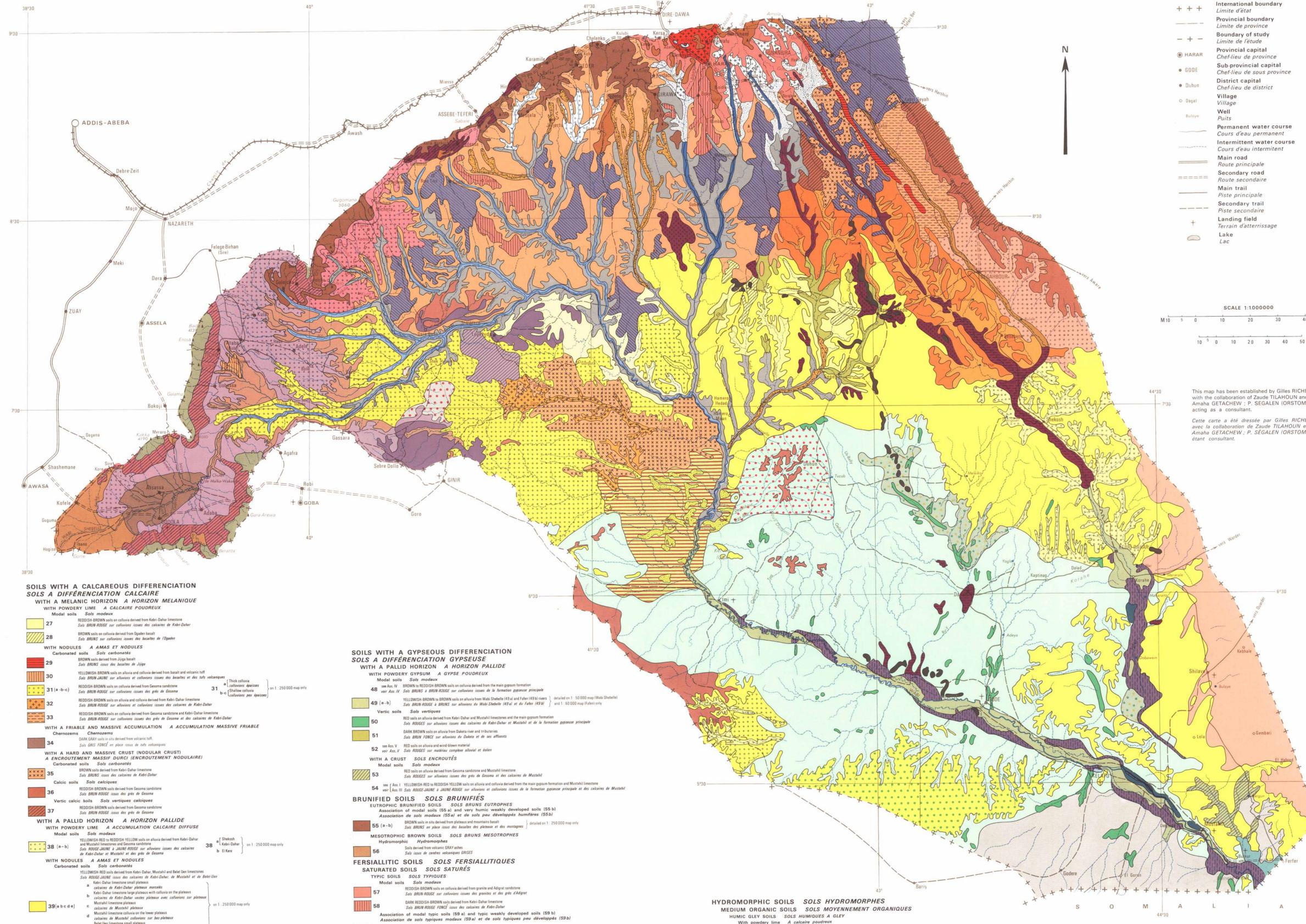
**V**  
**SOILS MAP - CARTE DES SOLS**

**Wabi Shebelle Basin**

OCTOBER 1973

**LEGEND OF THE SOILS MAP**  
**LEGENDE DE LA CARTE DES SOLS**

- WEAKLY DEVELOPED SOILS SOLS PEU EVOLUES**  
**XEROSOLS SOLS XERIQUEUES**  
**GRAY SOILS SOLS GRIS**  
 Gypseous soils *Sols gypseux*  
 1 (a-b) GRAY soils derived from the main gypsum formation  
*Sols GRIS issus de la formation gypseuse principale*
- NON CLIMATIC SOILS SOLS D'ORIGINE NON CLIMATIQUE**  
**ERODED SOILS SOLS D'EROSION**  
 Lithic soils with powdery lime *Sols lithiques à calcaire poudreux*  
 2 YELLOWISH RED soils derived from Kabi-Daha limestone  
*Sols ROUGE JAUNE issus des calcaires de Kabi-Daha*
- 3 see Ass. I Soils with superficial gypsum flag derived from the main gypsum formation  
*Sols sur dalle de gypse peu profonde issus de la formation gypseuse principale*  
 see Ass. II Soils with superficial gypsum flag derived from Fatha gypsum  
*Sols sur dalle de gypse peu profonde issus des gypses de Fatha*
- 4 BROWNISH GRAY soils derived from Ogaden basalt  
*Sols GRIS BRUN issus des basaltes de l'Ogaden*  
 Lentic calcareous soils *Sols lithiques calcareux*  
 5 LIGHT GRAY soils derived from granite boulders  
*Sols GRIS CLAIR issus des blocs granitiques*  
 6 RED soils derived from Adigrat sandstone  
*Sols ROUGES issus des grès d'Adigrat*
- 7 Humic soils *Sols humifères*  
 8 on 1:250 000 REDDISH BROWN soils derived from basaltic ash and basalt  
*Sols BRUN ROUGE issus de scories basaltiques et de basaltes*
- 9 see Ass. VI BROWN soils derived from Gesama sandstone and Mustahl limestone  
*Sols BRUN issus des grès de Gesama et des basaltes de Mustahl*
- SOILS DEVELOPED ON COLLUVIA SOLS D'APPORT COLLUVIAL**  
 With calcareous flints *A moucheures calcareuses*  
 10 (a-b) YELLOWISH BROWN soils on colluvium derived from Gesama sandstone  
*Sols BRUN ROUGE sur colluvium issus de grès de Gesama*  
 11 Yellowish brown soils on colluvium derived from granite  
*Sols BRUN ROUGE sur colluvium issus de granites*
- VERTISOLS VERTISOLS**  
**CRIMOSOLS**  
**VERTISOLS GRUMOSOLIQUES A DRAINAGE EXTERNE REDUIT**  
**CARBONATED VERTISOLS VERTISOLS CARBONATES**  
 With powdery lime and powdery gypsum *A calcaire poudreux et cristaux de gypse*  
 11 BROWN soils on alluvium and colluvium derived from Ogaden basalt  
*Sols BRUNS sur alluvium et colluvium des basaltes de l'Ogaden*  
 12 REDDISH BROWN soils on alluvium derived from Kabi-Daha and Mustahl limestone and from the main gypsum formation  
*Sols BRUN ROUGE sur alluvium issus des calcaires de Kabi-Daha et Mustahl et de la formation gypseuse principale*  
 13 (a-b) BROWN soils on alluvium from the Wabi Shebelle (13 a) and Fatha (13 b) rivers  
*Sols BRUNS sur alluvium de Wabi Shebelle (13 a) et de Fatha (13 b)* detailed on 1:50 000 map (Wabi Shebelle) and 1:100 000 map (Fatha) only
- 14 BROWN soils on alluvium from the Borale and the Fatha rivers  
*Sols BRUNS sur alluvium de Borale et de Fatha*  
 15 With calcareous nodules *A amas et nodules calcareux*  
 BROWN soils on colluvium derived from Kabi-Daha limestone  
*Sols BRUNS sur colluvium issus des calcaires de Kabi-Daha*
- CALCIC MODERATE VERTISOLS CALCICIQUES**  
 With nodules in the depth *A nodules au profondeur*  
 16 REDDISH BROWN soils on colluvium derived from basalt of the plateau and Gesama sandstone  
*Sols BRUN ROUGE sur colluvium issus des basaltes des plateaux et des grès de Gesama*  
 17 REDDISH BROWN soils derived from plateau basalt  
*Sols BRUN ROUGE issus des basaltes des plateaux*  
 18 DARK GRAY soils derived from plateau basalt  
*Sols GRIS FONCE issus des basaltes des plateaux*  
 19 DARK GRAY soils derived from plateau basalt with a volcanic ash layer on the surface  
*Sols GRIS FONCE sur plateau issus des basaltes des plateaux avec un mouvement d'andouze*  
 20 BLACK GRAY soils on alluvium derived from Kabi-Daha limestone  
*Sols GRIS NOIR sur alluvium issus des calcaires de Kabi-Daha*
- ANDOSOLS ANDOSOLS**  
**DIFFERENTIATED SOILS SOLS DIFFERENCIES**  
**SATURATED SOILS SOLS SATURES**  
 With a melanic horizon *Melanicques*  
 21 GRAY soils derived from mountain basalt  
*Sols GRIS issus des basaltes des montagnes*
- CALCIMAGNETIC SOILS SOLS CALCIMAGNETIQUES**  
**CARBONATED SOILS SOLS CARBONATES**  
 ASSOCIATION OF MODAL BROWN CALCAREOUS SOILS (22 a) AND MODAL RENDZINA (22 b)  
*ASSOCIATION DE SOLS BRUNS CALCAIRES MODAUX (22 a) ET DE RENDZINES MODAUX (22 b)*  
 22 (a-b) BROWN soils derived from Kabi-Daha limestone  
*Sols BRUNS issus des calcaires de Kabi-Daha* detailed on 1:250 000 map only
- 23 BROWN CALCAREOUS SOILS *SOLS BRUNS CALCAIRES*  
 Modal soils *Sols modaux*  
 BROWN soils on alluvium derived from Kabi-Daha limestone  
*Sols BRUNS sur alluvium issus des calcaires de Kabi-Daha*
- 24 RENDZINA *RENDZINES*  
 Modal rendzina *Rendzines modales*  
 BROWN soils derived from Kabi-Daha limestone  
*Sols BRUNS issus des calcaires de Kabi-Daha*
- SATURATED SOILS SOLS SATURES**  
 ASSOCIATION OF MODAL BROWN CALCIC SOILS (25 a) AND MODAL CALCIC RENDZINA (25 b)  
*ASSOCIATION DE SOLS BRUNS CALCICIQUES MODAUX (25 a) ET DE RENDZINES CALCICIQUES (25 b)*  
 25 (a-b) BROWN soils derived from Kabi-Daha limestone  
*Sols BRUNS issus des calcaires de Kabi-Daha* detailed on 1:250 000 map only
- 26 CALCIC RENDZINA *RENDZINES CALCICIQUES*  
 Modal rendzina *Rendzines modales*  
 BROWN soils derived from plateau basalt and volcanic tuff  
*Sols BRUNS issus des basaltes de plateaux et de tuff volcaniques*



- SOILS WITH A CALCAREOUS DIFFERENTIATION SOLS A DIFFERENCIATION CALCAIRE**  
**WITH A MELANIC HORIZON A HORIZON MELANIQUE**  
**WITH POWDERY LIME A CALCAIRE POUFREUX**  
 Modal soils *Sols modaux*  
 27 REDDISH BROWN soils on colluvium derived from Kabi-Daha limestone  
*Sols BRUN ROUGE sur colluvium issus des calcaires de Kabi-Daha*  
 28 BROWN soils on colluvium derived from Ogaden basalt  
*Sols BRUNS sur colluvium issus des basaltes de l'Ogaden*
- WITH NODULES A AMAS ET NODULES**  
 Carbonated soils *Sols carbonates*  
 29 BROWN soils derived from Jijiga basalt  
*Sols BRUNS issus des basaltes de Jijiga*  
 30 YELLOWISH BROWN soils on alluvium and colluvium derived from basalt and volcanic tuff  
*Sols BRUN JAUNE sur alluvium et colluvium issus des basaltes et des tuff volcaniques*  
 31 (a-b-c) REDDISH BROWN soils on colluvium derived from Gesama sandstone  
*Sols BRUN ROUGE sur colluvium issus des grès de Gesama* detailed on 1:250 000 map only  
 31a Yellowish brown soils on colluvium derived from granite boulders  
*Sols BRUN ROUGE sur colluvium issus de granites*  
 31b Yellowish brown soils on colluvium derived from granite boulders  
*Sols BRUN ROUGE sur colluvium issus de granites*  
 31c Yellowish brown soils on colluvium derived from granite boulders  
*Sols BRUN ROUGE sur colluvium issus de granites*
- 32 REDDISH BROWN soils on alluvium and colluvium derived from Kabi-Daha limestone  
*Sols BRUN ROUGE sur alluvium et colluvium issus des calcaires de Kabi-Daha*  
 33 REDDISH BROWN soils on colluvium derived from Gesama sandstone and Mustahl limestone  
*Sols BRUN ROUGE sur colluvium issus des grès de Gesama et des calcaires de Kabi-Daha*
- WITH A FRIABLE AND MASSIVE ACCUMULATION A ACCUMULATION MASSIVE FRIABLE**  
 Chernozems *Chernozemes*  
 34 DARK GRAY soils derived from volcanic tuff  
*Sols GRIS FONCE sur plateau issus de tuff volcaniques*
- WITH A HARD AND MASSIVE CRUST (NODULAR CRUST) A ENCROUTEMENT MASSIF DURCI (ENCROUTEMENT NODULAIRE)**  
 Carbonated soils *Sols carbonates*  
 35 BROWN soils derived from Kabi-Daha limestone  
*Sols BRUNS issus des calcaires de Kabi-Daha*  
 Calcic soils *Sols calciques*  
 36 REDDISH BROWN soils derived from Gesama sandstone  
*Sols BRUN ROUGE issus des grès de Gesama*  
 Vertic calcic soils *Sols vertiques calciques*  
 37 REDDISH BROWN soils derived from Gesama sandstone  
*Sols BRUN ROUGE issus des grès de Gesama*
- WITH A PALLID HORIZON A HORIZON PALLIDE**  
**WITH POWDERY LIME A ACCUMULATION CALCAIRE DIFFUSE**  
 Modal soils *Sols modaux*  
 38 (a-b) YELLOWISH RED to REDDISH YELLOW soils on alluvium derived from Kabi-Daha limestone  
*Sols BRUN JAUNE à ROUGE JAUNE sur alluvium issus des calcaires de Kabi-Daha et Mustahl et des grès de Gesama* detailed on 1:250 000 map only  
 38a Yellowish red soils on alluvium derived from Kabi-Daha limestone  
*Sols BRUN JAUNE sur alluvium issus des calcaires de Kabi-Daha*  
 38b Red soils on alluvium derived from Kabi-Daha limestone  
*Sols BRUNS sur alluvium issus des calcaires de Kabi-Daha*
- WITH NODULES A AMAS ET NODULES**  
 Carbonated soils *Sols carbonates*  
 YELLOWISH RED soils derived from Kabi-Daha limestone  
*Sols BRUN JAUNE issus des calcaires de Kabi-Daha*  
 39 (a-b-c-d) BROWN soils derived from Gesama sandstone  
*Sols BRUNS issus des grès de Gesama* detailed on 1:250 000 map only  
 39a BROWN soils on alluvium derived from Gesama sandstone  
*Sols BRUNS sur alluvium issus des grès de Gesama*  
 39b BROWN soils on alluvium derived from Gesama sandstone  
*Sols BRUNS sur alluvium issus des grès de Gesama*  
 39c BROWN soils on alluvium derived from Gesama sandstone  
*Sols BRUNS sur alluvium issus des grès de Gesama*  
 39d BROWN soils on alluvium derived from Gesama sandstone  
*Sols BRUNS sur alluvium issus des grès de Gesama*
- see Ass. III RED soils on alluvium derived from Gesama sandstone  
*Sols BRUNS sur alluvium issus des grès de Gesama*  
 40 RED soils on alluvium derived from Gesama sandstone  
*Sols BRUNS sur alluvium issus des grès de Gesama*  
 41 REDDISH BROWN soils on alluvium from Jijiga river  
*Sols BRUN ROUGE sur alluvium de Jijiga*  
 see Ass. IV YELLOWISH BROWN soils on alluvium derived from Gesama sandstone  
*Sols BRUN JAUNE sur alluvium issus des grès de Gesama*  
 42 RED soils on alluvium and sandstone material  
*Sols BRUNS sur alluvium et matériel sableux et argileux*  
 see Ass. V RED soils on alluvium and sandstone material  
*Sols BRUNS sur alluvium et matériel sableux et argileux*
- Calcic soils *Sols calciques*  
 44 RED soils derived from Gesama sandstone  
*Sols BRUNS issus des grès de Gesama*  
 45 (a-b) RED soils on alluvium (45 a) and colluvium (45 b) derived from Gesama sandstone  
*Sols BRUNS sur alluvium (45 a) et colluvium (45 b) issus des grès de Gesama* detailed on 1:250 000 map only
- 46 Vertic carbonated soils *Sols vertiques carbonates*  
 REDDISH BROWN soils on colluvium derived from Kabi-Daha limestone  
*Sols BRUN ROUGE sur colluvium issus des calcaires de Kabi-Daha*  
 47 LIGHT BROWN soils derived from Kabi-Daha limestone  
*Sols BRUN CLAIR issus des calcaires de Kabi-Daha*
- WITH A HARD AND MASSIVE CRUST (NODULAR CRUST) A ENCROUTEMENT MASSIF DURCI (ENCROUTEMENT NODULAIRE)**  
 Carbonated soils *Sols carbonates*  
 48 RED soils on alluvium derived from Gesama sandstone and Mustahl limestone  
*Sols BRUNS sur alluvium issus des grès de Gesama et des calcaires de Mustahl*  
**SOILS WITH A GYPSEOUS DIFFERENTIATION SOLS A DIFFERENCIATION GYPSEUSE**  
**WITH A PALLID HORIZON A HORIZON PALLIDE**  
**WITH POWDERY GYPSUM A GYPSE POUFREUX**  
 Modal soils *Sols modaux*  
 49 (a-b) YELLOWISH BROWN to BROWN soils on alluvium from Wabi Shebelle (49 a) and Fatha (49 b) rivers  
*Sols BRUN JAUNE à BRUNS sur alluvium de Wabi Shebelle (49 a) et de Fatha (49 b)* detailed on 1:50 000 map (Wabi Shebelle) and 1:100 000 map (Fatha) only
- Vertic soils *Sols vertiques*  
 50 RED soils on alluvium derived from Kabi-Daha and Mustahl limestone and the main gypsum formation  
*Sols ROUGES sur alluvium issus des calcaires de Kabi-Daha et Mustahl et de la formation gypseuse principale*  
 51 DARK BROWN soils on alluvium from Daka river and affluents  
*Sols BRUN FONCE sur alluvium de Daka et de ses affluents*  
 52 see Ass. V RED soils on alluvium and volcanic material  
*Sols BRUNS sur alluvium et matériel volcanique*  
 see Ass. V RED soils on alluvium and volcanic material  
*Sols BRUNS sur alluvium et matériel volcanique*
- WITH A CRUST SOLS ENCRUTES**  
 Modal soils *Sols modaux*  
 53 RED soils on alluvium derived from Gesama sandstone and Mustahl limestone  
*Sols BRUNS sur alluvium issus des grès de Gesama et des calcaires de Mustahl*  
 see Ass. VI YELLOWISH RED to REDDISH YELLOW soils on alluvium and colluvium derived from the main gypsum formation and Mustahl limestone  
*Sols BRUN JAUNE à BRUN ROUGE sur alluvium et colluvium issus de la formation gypseuse principale et des calcaires de Mustahl*
- BRUNIFIED SOILS SOLS BRUNIFIES**  
**EUTROPHIC BRUNIFIED SOILS SOLS BRUNS EUTROPHES**  
 Association of modal soils (55 a) and very humic weakly developed soils (55 b)  
*Association de sols modaux (55 a) et de sols peu développés humifères (55 b)*  
 55 (a-b) BROWN soils in situ derived from plateau and mountain basalt  
*Sols BRUNS in situ issus des basaltes des plateaux et des montagnes* detailed on 1:250 000 map only
- 56 MESOTROPHIC BROWN SOILS *SOLS BRUNS MESOTROPHES*  
 Hydromorphic *Hydromorphes*  
 56 SOILS derived from volcanic GRAY ash  
*Sols issus des cendres volcaniques GRIS*
- FERRALLITIC SOILS SOLS FERRALLITIQUES**  
**SATURATED SOILS SOLS SATURES**  
**TYPIC SOILS SOLS TYPIQUES**  
 Modal soils *Sols modaux*  
 57 REDDISH BROWN soils on colluvium derived from granite and Adigrat sandstone  
*Sols BRUN ROUGE sur colluvium issus des granites et des grès d'Adigrat*  
 58 DARK REDDISH BROWN soils derived from Kabi-Daha limestone  
*Sols BRUN FONCE issus des calcaires de Kabi-Daha*  
 Association of modal typical soils (59 a) and typical weakly developed soils (59 b)  
*Association de sols typiques modaux (59 a) et de sols typiques peu développés (59 b)*  
 59 (a-b) RED soils derived from Gesama sandstone  
*Sols BRUNS issus des grès de Gesama* detailed on 1:250 000 map only
- FERRALLITIC SOILS SOLS FERRALLITIQUES**  
**WEAKLY DESATURATED OR SATURATED SOILS SOLS FAIBLEMENT DESATURES OU SATURES**  
**TYPIC SOILS SOLS TYPIQUES**  
 Modal soils *Sols modaux*  
 60 RED soils on complex material derived from Kabi-Daha limestone, Adigrat sandstone and granite  
*Sols BRUNS sur complexe matériel issu des calcaires de Kabi-Daha, des grès d'Adigrat et des granites*
- HUMIC SOILS SOLS HUMIQUES**  
 61 REDDISH BROWN soils derived from basalt of the plateau  
*Sols BRUN JAUNE issus des basaltes des plateaux*  
 62 see Ass. VI YELLOWISH BROWN soils on colluvium derived from Gesama sandstone  
*Sols BRUN JAUNE sur colluvium issus des grès de Gesama*  
 Association of typical modal soils (63 a) and weakly developed soils (63 b)  
*Association de sols typiques modaux (63 a) et de sols typiques peu développés (63 b)*  
 63 (a-b) RED soils derived from Gesama sandstone  
*Sols BRUNS issus des grès de Gesama*
- 64 Association of very humic weakly developed soils and typical humic weakly developed soils  
*Association de sols humifères peu développés et de sols typiques peu développés humifères*  
 REDDISH BROWN soils derived from mountain basalt  
*Sols BRUN ROUGE issus des basaltes des montagnes*

- +++ International boundary  
 --- Provincial boundary  
 --- Boundary of province  
 --- Boundary of study  
 ● HARAR Provincial capital  
 ● GODE Sub-provincial capital  
 ● Duhun District capital  
 ○ Dagal Village  
 Well  
 Puits  
 Permanent water course  
 Intermittent water course  
 Intermittent water course  
 Main road  
 Secondary road  
 Main trail  
 Secondary trail  
 Landing field  
 Terrain d'atterrissage  
 Lake  
 Lac

SCALE 1:1000000  
 0 5 10 20 30 40 50 Km

This map has been established by Gilles RICHE with the collaboration of Zaude TILAHOUN and Amaha GETACHEW, P. SEGALEN (ORSTOM) acting as a consultant.  
 Cette carte a été dressée par Gilles RICHE avec la collaboration de Zaude TILAHOUN et Amaha GETACHEW, P. SEGALEN (ORSTOM) étant consultant.

**SOILS ASSOCIATIONS ASSOCIATIONS DE SOLS**

Location	Utilités
Ass. I Lower Ogden Bar Ogden	3 + 54
Ass. II South Erena El Kedi Sud	4 + part. 39 c
Ass. III North In Am Wey	40 + 54
Ass. IV Duhun	42 + 48
Ass. V Duhun-North Dera	43 + 52
Ass. VI Shik Hussein	9 + 62